



# MALTA COMPETITIVENESS REPORT 2020





**National Productivity Board  
Annual Report  
2020**



Following the Council Recommendation of 20 September 2016 on the establishment of National Productivity Boards (2016/C 349/01), Euro Area member states were invited to set up a productivity board with the scope of analysing developments and policies in the field of productivity and competitiveness, thereby contributing to foster ownership and implementation of the necessary reforms at the national level, and hence promote a more sustained economic growth and convergence.

The Malta National Productivity Board (NPB) was set up in 2019 and is comprised of a total of 11 members which includes:

- The Chairman (ex-officio Chair of MCESD) – Mr. John Bencini, later replaced by Mr. James Pearsall in July 2020 as the new Chair for MCESD;
- A representative from MCESD – Ms. Adriana Chircop MCESD
- A representative from the Economic Policy Department – Mr. Godwin Mifsud;
- A representative from the Central Bank of Malta – Mr. Ian Borg;
- 4 members that were nominated by the workers' organisations constituted bodies sitting in the Council – Mr. Christopher Attard, Mr. Josef Vella, Mr. Mario Sacco, & Mr. Victor Carachi;
- 4 members nominated by constituted bodies representing national employers' organisations sitting in the Council – Ms. Abigail Mamo, Ms. Angela Attard Fenech, Mr. Joseph Farrugia, & Mr. Kevin Borg;
- Secretary to the Board – Ms. Adriana Chirchop;
- Coordinator of NPB Annual Report- Ms. Maria Cini.

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The cut-off date for the report is 10 October 2020.

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The Environment and Resources Authority

The European Economic and Social Committee

The Malta Chamber of Commerce

The Malta College of Arts, Science and Technology

The Ministry for Education

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## Executive summary

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The Malta Council for Economic and Social Development (MCESD) act Article 8(b) 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 seeks to present an analysis of the current economic scenario in Malta and subsequently provide policymakers with several recommendations intended.

In the most recent years, the macroeconomic scenario in Malta has been relatively buoyant. Indeed, growth in GDP had reached a peak of 10.9% during 2015 before stabilising somewhat in subsequent years, with a growth of 4.7% in 2019. This deceleration in growth is partly attributed to the less prevalent external demand conditions in key foreign markets, with EU-27 and EA-19 registering growth rates in GDP of only 1.5% and 1.3%, respectively in 2019. At the same time, in terms of public finances, the general government balance had exceeded its medium-term budgetary objective of budget balance in 2016, while the debt-to-GDP ratio had fallen significantly below the 60% threshold, reaching 43.1% in 2019.

The COVID-19 pandemic is expected to disrupt the robust economic growth experienced in recent years, due to its impact on key sectors of the Maltese economy, particularly on tourism related industries. Also, as a result of the series of stimulus measures announced by the Government to cushion the effect of the pandemic on the Maltese economy, public finances are also expected to deteriorate, with the fiscal surplus registered in 2019 expected to turn into a deficit for 2020, while the debt to GDP ratio is expected to rise from the record lows recorded in previous years.

The COVID-19 pandemic will therefore disrupt the economic reality experienced in recent years. Even though assessing the full impact that COVID-19 will have on the economy is currently a complex task, due to the high level of uncertainty surrounding various aspects of the pandemic, this report seeks to analyse the short-term impact of COVID-19 on the Maltese economy with an application of input-output analysis, and the medium-term impact on potential output, utilising a production function approach.



The analysis considers three different scenarios, each carrying different assumptions on the impact of the pandemic; a mild, a medium and a severe scenario. The results show that in the short-term, the Maltese economy may experience a contraction in gross value added generated ranging between 8.7% and 15.3%. Indeed, this will in turn have a heterogeneous impact across the various industries and sectors of the economy. The most impacted sectors are of course those related to the tourism industry, given the several restrictions on travel put in place across Europe and the World. On the other hand, in the medium-term potential output is estimated to be around 5.5% to 10.6% lower in 2020 when looking across the different scenarios. The accumulated discrepancy in the generation of potential output after 2020 is however expected to have a permanent effect on the economy's productive capacity in the medium-term. A recovery strategy from the crisis should therefore also incorporate the plans to enhance efforts toward further economic diversification in the Maltese economy. The Next Generation EU as well as the 2021–2027 EU Multiannual Financial Framework (MFF) provide adequate financial opportunities for the Maltese Islands to restructure our economy and boost recovery.

The analysis in this report goes beyond the measure of national productivity and GDP growth, but rather endorses the idea that the quality of life of people is in itself an important element to make a country competitive, productive, and attractive for investment purposes. This report also looks at the different factors that determine competitiveness. The competitiveness enablers reviewed include factor (input) conditions, which include human capital and social infrastructure, physical infrastructure, and ease of doing business. The analysis of factor conditions is followed by an analysis of institutional quality, monetary and fiscal policy, market conditions, and innovation. Following this analysis, an overview of Malta's overall competitiveness and sustainable competitiveness is provided. Of course, several challenges and opportunities for Malta have emerged as a result of COVID-19.

Given that productivity is a key driver of economic growth this report seeks to provide econometric evidence of its key determinants. In particular, the possibility of a causal link between foreign direct investment (FDI) and total factor productivity (TFP) across the EU Member States is analysed. The empirical results confirm that average effective corporate taxes are strongly and negatively related to FDI. In turn, FDI is an important and positive determinant of TFP, with the results suggesting that a 1.0% increase in FDI leads to a 14.0% increase in TFP.

Of course, these results are highly relevant with regards to policies aimed at enhancing productivity in the Maltese economy, especially in the light of a possible shift post COVID-19 towards tax alignment across the EU, as well as the role of FDI as a tool to enhance medium and long-term economic growth. The corporate income tax is an important variable which influences the location of new investment by companies, thus supporting the behaviour of governments towards fiscal policies. This supports the fact that governments offer an investment-friendly environment through competitive tax rates, as it encourages more foreign investment. Additionally, good governance that protects investors and entrepreneurs against expropriation and trade openness also influences the degree of investment a country will receive. This implies that a country like Malta, situated at the periphery of the EU, should give priority to policies that aim to attract FDI whilst stressing other determinants of TFP within the context of enhanced digitalisation and investment opportunities resulting from the European Green Deal.

The final chapter of this report provides several overarching recommendations, which are provided on the basis of the analysis carried out in this report and based on expert opinions. These recommendations are based on three key areas being; enhancing the labour productivity and human capital, focusing more on the digital economy and innovation and recommendations on the environment based on the Green Deal Policy. Of course, COVID-19 has shown that the digital revolution could play a critical role in increasing our societies' crisis resilience. Investing in digitalisation of essential services and increasing the ability of our public administration and public regulators to deliver their services efficiently and effectively is vital to support sustainable economic growth. At the same time, digital technologies are a means to an end and that developing human resources should always be the priority for our economy.

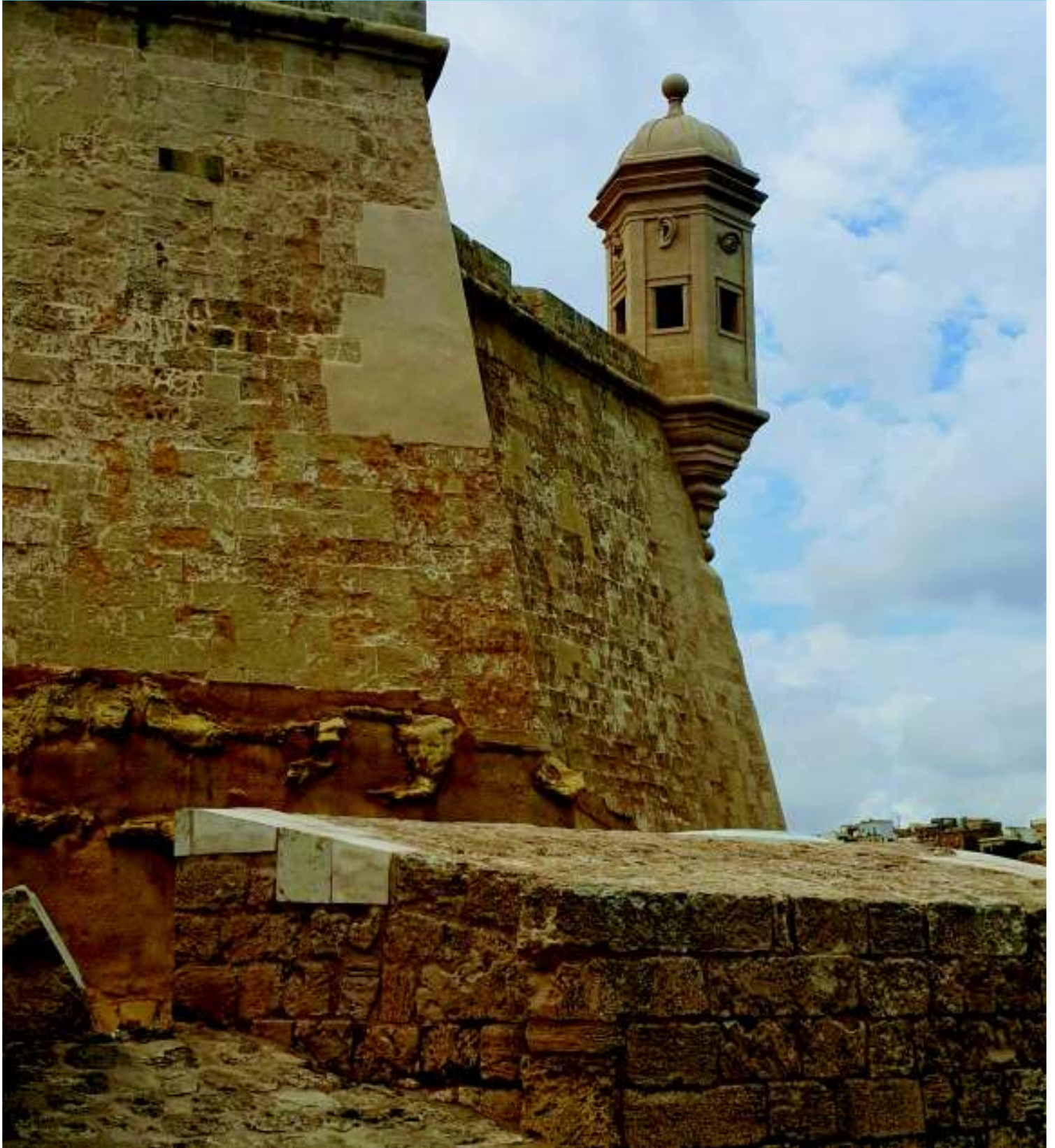
The recommendations are categorised in terms of implementation priority from low to high. High priority recommendations are those requiring immediate attention especially when taking into consideration the need to enhance productivity and economic resilience. Medium priority recommendations on the other hand are not deemed to require immediate attention to the same degree as those identified as high priority. Nonetheless, they are still deemed to be of significant importance to the overall productivity and competitiveness of the Maltese economy. This chapter also refers to the 2019 recommendations and provides an update covering implementation priority, implementation progress, and consistency with the recommendations contained in this

chapter. This is considered highly relevant as a link with the 2019 report and is supported by evidence wherever possible.

This report is set up as follows. **Chapter 1** provides an overview of the Maltese economy with a focus on the macroeconomic outlook and the developments in its key sectors. **Chapter 2** then analysis the impact of the COVID-19 pandemic on the Maltese economy both in the short-term and in the medium-term. **Chapter 3** gives a comparative analysis of the key drivers of competitiveness in Malta, while **Chapter 4** discusses the key drivers of productivity. **Chapter 5** then presents a list of recommendations emanating from the analysis carried out in this report. **Chapter 6** presents the Report's concluding remarks.

# Chapter 1

## Overview of the Maltese economy





## **1.1 Macroeconomic outlook**

This section provides a comprehensive assessment of the current macroeconomic situation in Malta, together with recent trends and developments in select indicators. For practical reporting purposes, this analysis will consider Q2 2020 as the latest time period under consideration, due to data availability constraints, which overlaps somewhat with the outbreak of COVID-19 and subsequent lockdown measures, although may not capture the full extent of the economic impact. Wherever possible, the domestic situation will be compared directly to developments across the rest of the European Union (EU-27) and Euro Area countries (EA-19), in order to provide context to Malta's macroeconomic conditions.

### **1.1.1 GDP Growth**

The Maltese economy has rebounded and indeed flourished since the 2009 economic crisis, consistently outperforming the rest of the EA-19 and EU-27 countries. Indeed, since 2011 Malta has recorded an annual average growth rate of around 5.9%, peaking at 10.9% during 2015 before stabilising somewhat in subsequent years, with annual growth dropping to 4.7% in 2019. This reflects a general slowdown in economic activity even before the COVID-19 crisis, particularly with regards to external demand conditions in key foreign markets, with the EU-27 and EA-19 countries registering an average annual growth of 1.5% and 1.3% respectively in 2019.

Private consumption continues to be a key component of Malta's economic activity, growing by over 29.0% in real terms between 2011 and 2019, and now accounts for 45.9% of GDP, down from 58.7% in 2011 (NSO, 2020). Similarly, gross fixed capital formation, which captures investment expenditure, has increased by almost 66.0% since 2011, accounting for over 18.0% of GDP in 2019. This underscores the importance of investment in Malta's recent economic success, notably with regards to dwellings and buildings, machinery and equipment and intellectual property products, which have all grown exponentially over the period under review. Another important driver of economic growth has been Malta's international trade balance (i.e. exports less imports of goods and services), which has grown from around 2.2% of GDP in 2011 to over 18.0% in 2019, reflecting significant growth in export activity over time, particularly with regard to services, including inbound tourism.

From a sectoral perspective, during the period 2011 to 2019 Malta's shift towards service-based economic sectors continued unabated (See table 1.1). In particular, 'professional, scientific and technical activities; administrative and support service activities' as well as 'arts, entertainment and recreation, repair of household goods and other services' (mainly in relation to the Gaming sector) both registered significant gains in terms of their relative contribution to Malta's Gross Value Added (GVA).

**Table 1.1 Sectoral contribution to GVA, 2011 and 2019**

<b>SECTORS</b>	<b>2011</b>	<b>2019</b>
Agriculture, forestry and fishing	1.6%	0.9%
Mining and quarrying; manufacturing; electricity, gas, steam and air conditioning supply; water supply; sewerage, waste management and remediation activities	14.6%	9.8%
Construction	4.7%	3.8%
Wholesale and retail trade; repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities	21.6%	20.8%
Information and communication	6.2%	6.7%
Financial and insurance activities	7.7%	5.6%
Real estate activities	6.2%	5.1%
Professional, scientific and technical activities; administrative and support service activities	9.5%	15.2%
Public administration and defence; compulsory social security; education; human health and social work activities	18.7%	16.9%
Arts, entertainment and recreation, repair of household goods and other services	9.2%	15.2%

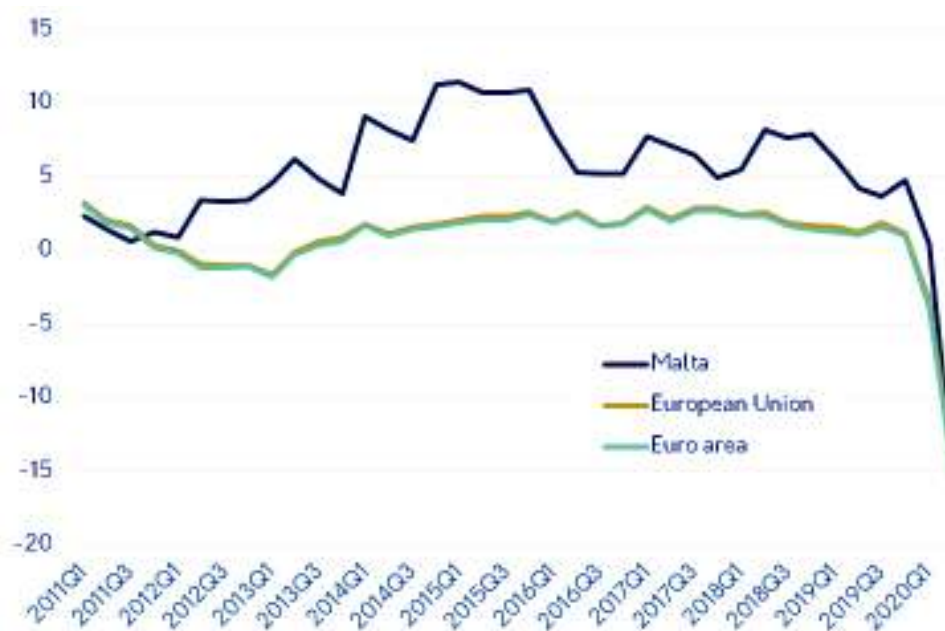
(Source: NSO, 2020)

'Wholesale and retail trade; repair of motor vehicles and motorcycles; transportation and storage; accommodation and food service activities' retained its relative economic importance, mainly on the back of a buoyant tourism industry that continued to register notable increases in both arrivals and spending over the period under review. On the flipside, despite increases in absolute terms, the relative share of both agriculture and manufacturing in the Maltese economy continued to diminish, further emphasizing

Malta's higher dependence on the services sectors. Within the context of the COVID-19 crisis, this shift has important economic implications. On the one hand, service-based sectors are more predisposed to remote working arrangements than manufacturing, thus reducing business disruptions caused by social distancing and lockdown measures. On the other hand, industries like tourism have been particularly hard-hit by the crisis due to travel restrictions, not to mention issues related to food security.

The onset of COVID-19 in March 2020 and subsequent lockdown and containment measures have predictably had a significant impact on economic conditions across the globe, with the EU being no exception. In fact, during the second quarter of 2020 the EU-27 economy shrank by 14.4% compared to the same period in 2019, with the EA-19 faring worse with a 15.0% contraction in real GDP (See chart 1.1). The Maltese also registered negative growth of -14.9% in 2020 Q2, which reflects the scale of the crisis and its impact on key economic sectors like tourism. Nonetheless, Malta's rapid economic recovery and resilience during the 2009 economic crisis bodes well for the current situation, although this partially depends on the extent to which other key markets in the EU can rebound and regain their economic footing.

**Chart 1.1 Real GDP Growth year-on-year change (%)**

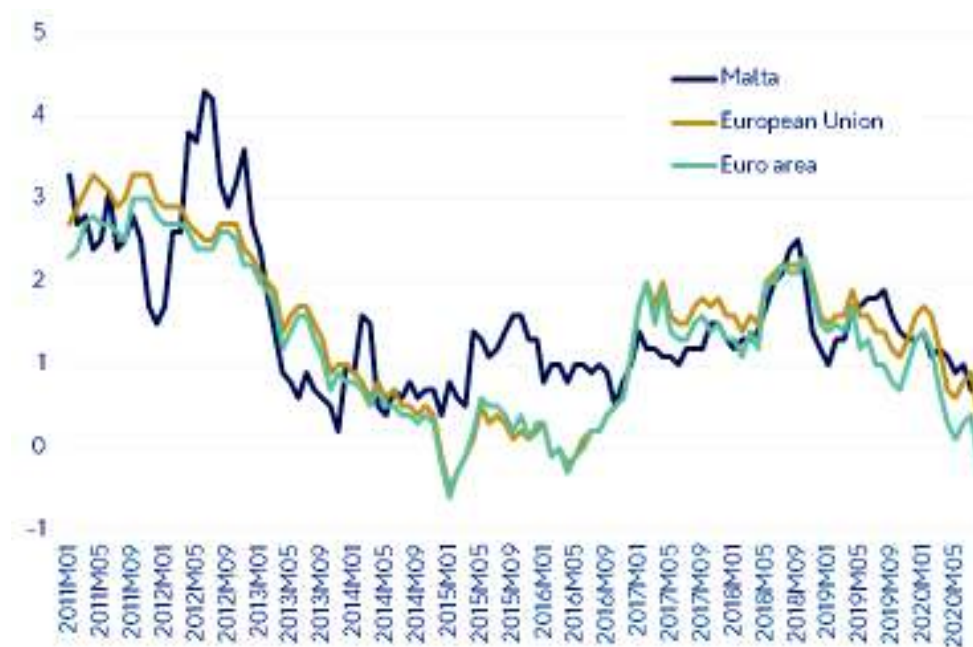


Source: NSO, 2020; Eurostat, 2020)

### 1.1.2 Inflation

Malta's rate of inflation has, in recent years, consistently hovered below the 2.0% medium-term target of the European Central Bank (ECB) (See chart 1.2). In fact, over the period January 2011 to August 2020 monthly inflation in Malta averaged at 1.6%, slightly above the EU-27 and EA-18 averages of 1.5% and 1.3% respectively. Indeed, Malta's inflation rate has stabilized significantly since the peaks recorded in 2012, and subsequently has remained relatively constant, despite the elevated levels of economic growth recorded over this period. The only components of the HICP which averaged above the 2% target over the period under review were 'alcoholic beverages, narcotics and tobacco' (3.7%), 'education' (3.3%), 'food and non-alcoholic beverages' (3%) and 'restaurants and hotels' (2.1%), while prices related to 'communication' (-3.3%) and 'clothing and footwear' (-0.6%) recorded a decline on average (NSO, 2020).

**Chart 1.2 Monthly HICP year-on-year change (%)**



Source: NSO, 2020; Eurostat, 2020

### 1.1.3 Employment Trends

Malta's impressive economic performance in recent years is also reflected in employment growth figures recorded over this period, averaging at 3.9% per quarter



(year-on-year), with a significant upward trajectory, noticeable since the 2009 economic crisis ([See chart 1.3](#)). The resilience of Malta's economy is also reflected in the fact that since 2007 employment only contracted in one quarter, namely 2009 Q3, before swiftly rebounding thereafter. Recent data for 2020 further backs up this claim, with year-on-year growth of 2.8% recorded in 2020 Q2, although results for subsequent quarters may provide a more realistic picture of the current situation as the new economic realities precipitated by the COVID-19 pandemic properly set in.

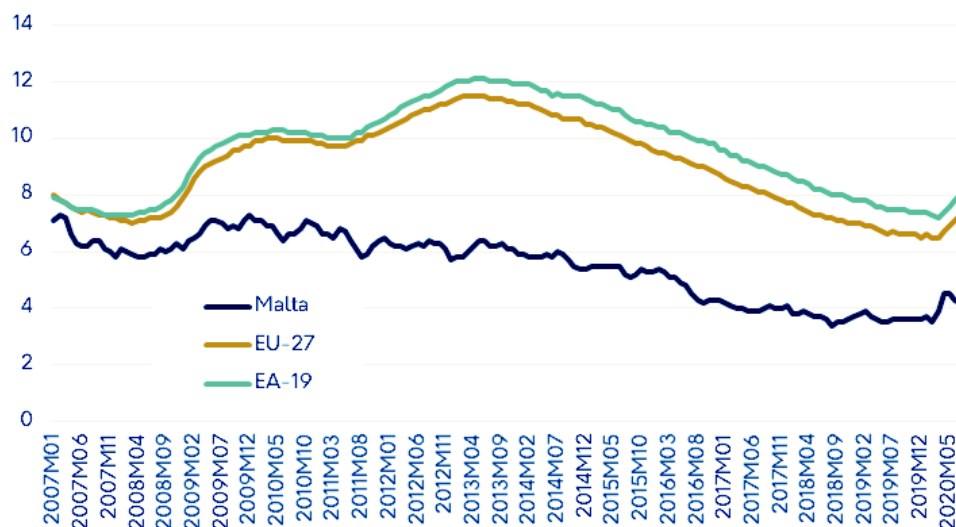
**Chart 1.3 Growth in employment year-on-year change (%)**



Source: NSO, 2020; Eurostat, 2020

Unemployment in Malta has followed a steady, downward trajectory in recent years, with the sole exception of a brief upswing in 2009 ([See chart 1.4](#)). In fact, by December 2019 the unemployment rate in Malta stood at 3.3%, relative to 7.1% recorded in January 2007. Over the period under review, Malta's unemployment rate has consistently been below that recorded in the EU-27 and EA-19, with the gap widening in recent years owing to Malta's strong economic performance. Unemployment has nonetheless increased somewhat over the last few months as a result of the COVID-19 pandemic, with the latest data suggesting that unemployment in August 2020 reached 4.1%, although the various fiscal measures introduced by the Maltese government should assist in keeping any future increases under control.

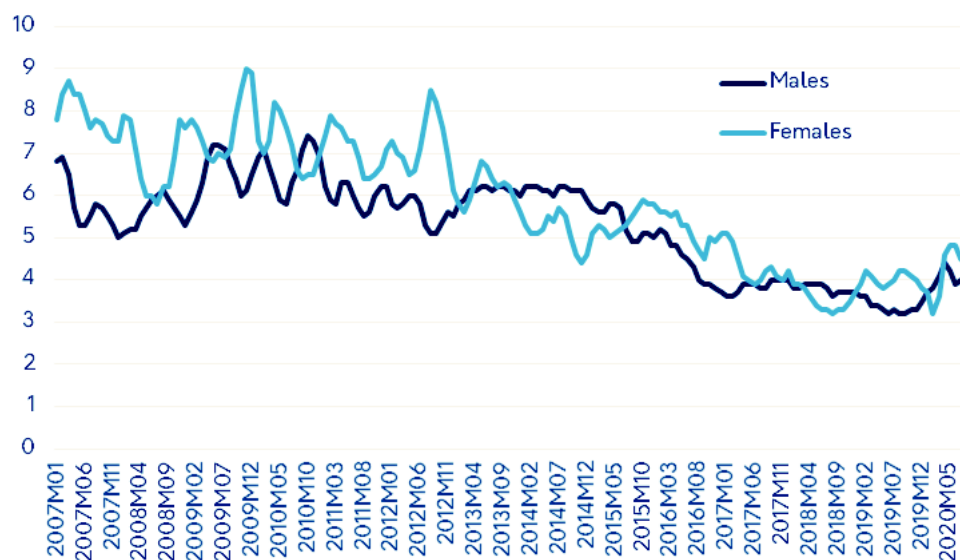
**Chart 1.4 Unemployment rate, seasonally adjusted (%)**



Source: NSO, 2020; Eurostat, 2020

Turning now to the gender decomposition of unemployment in Malta, both male and female unemployment rates have dovetailed each other to some extent in recent years, although female unemployment has tended to be somewhat higher (See chart 1.5). The latest data indicates that male unemployment in August 2020 stood at 3.8%, while female unemployment reached 4.4%. An interesting observation concerns the rate of labour market inactivity across both genders. As seen from chart 1.6, male inactivity has remained fairly constant over time, reaching 13.9% in 2019. This is significantly lower than the EU-27 and EA-19 inactivity rates of 20.9% and 21.1% respectively, indicating that a higher proportion of working-age men in Malta are actively willing and able to work. We also observe that female inactivity has fallen by over 45.0% over the same period, reaching 34.0% by the end of 2019. This indicates that female participation in the labour market has increased significantly in recent years, reflecting changing attitudes as well as government support measures (such as the free childcare services), and is crucial to the unlocking and deployment of untapped human capital. The rate of female inactivity in Malta is still slightly below that in the EU-27 (32%) and EA-19 (31.3%), indicating that there is still some scope for improvement, although this gap is relatively small and has shrunk significantly over time, which is testament to the progress made in this regard domestically.

**Chart 1.5 Unemployment rate in Malta by gender, seasonally adjusted (%)**



Source: NSO, 2020

**Chart 1.6 Labour market inactivity rate in Malta by gender (%)**

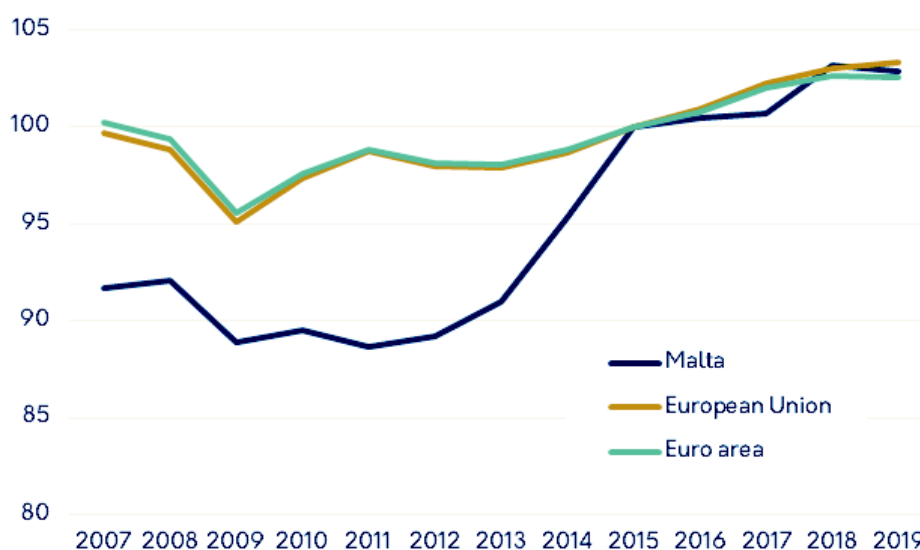


Source: NSO, 2020

#### 1.1.4 Total Factor Productivity (TFP)

Productivity is a key driver of economic activity, not simply in terms of generating higher levels of growth and output, but also in the pursuance of improved wages and living standards. Malta's TFP, which is typically related to productivity from technological advancement, has grown significantly since the 2009 economic crisis, increasing at a much faster pace than the rest of the EU and Euro Area countries since 2012 (See [chart 1.7](#)). In fact, by the end of 2019 Malta's TFP was slightly below that of the EU-27, and marginally higher than the EA-19.

**Chart 1.7 Total Factor Productivity, index (2015=100)**

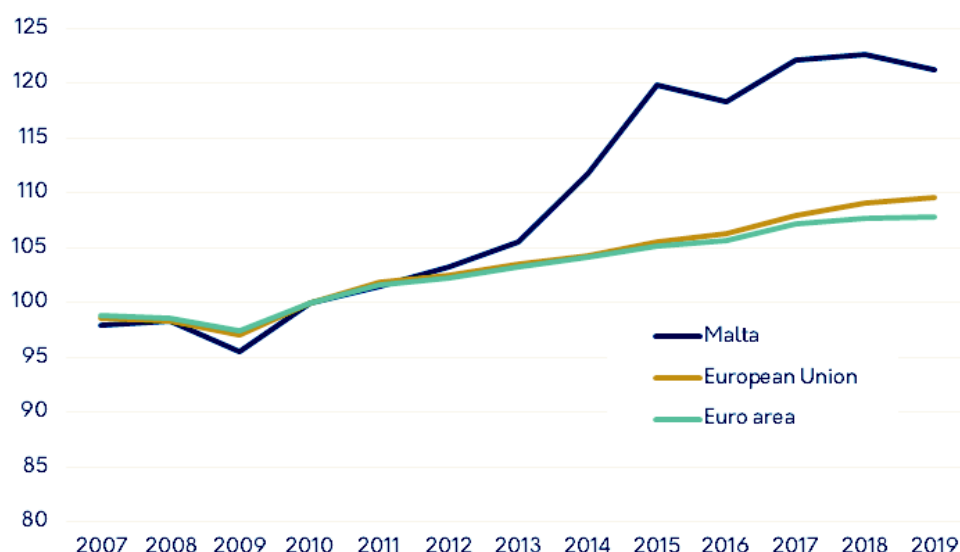


Source: ECFIN, 2020

We now turn to labour productivity, denoted in terms of hours worked in order to account for differences in working times across full-time and part-time workers. Once again, we observe notable growth in Malta's labour productivity over recent years, such that aggregate labour productivity is now higher in Malta than both the EU-27 and EA-19 (See [chart 1.8](#)). Thus, Malta's recent macroeconomic performance, with elevated levels of GDP growth and plummeting unemployment, has also been characterized by significant improvements in productivity, both in terms of technological growth and higher levels of output per labour hour. These trends are of particular importance to

Malta's medium and long-term economic prosperity as we enter the post-COVID recovery phase, as well as Malta's overall competitiveness.

**Chart 1.8 Real labour productivity per hour worked, index (2010=100)**



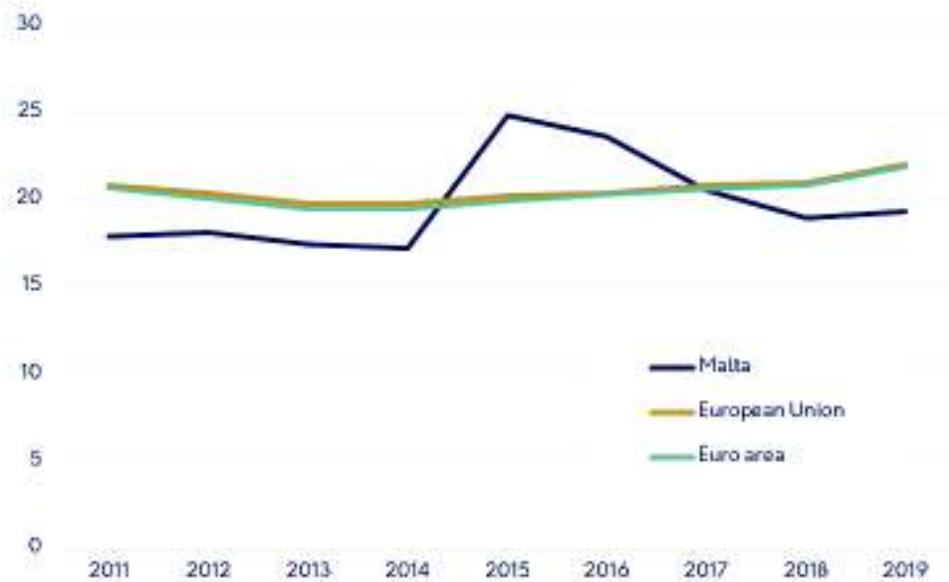
Source: Eurostat, 2020

### 1.1.5 Investment

As previously mentioned, investment has been a key driver behind Malta's recent economic success. Apart from generating output and new employment opportunities, gross fixed capital formation (GFCF) also has knock-on effects on productivity via technological improvements, particularly when it comes to foreign direct investment (Li & Tanna, 2019; Spiteri & von Brockdorff, 2020). Malta's GFCF as a proportion of GDP is broadly in line with the rest of the EU-27 and EA-19, peaking at 25.0% in 2015 and generally fluctuating around the 20% mark over the entire period under review (See [chart 1.9](#)). A breakdown of the key components of GFCF shows that dwellings and other buildings and structures collectively account for around 54.0% of annual GFCF in Malta in 2019, consistent with the general trend in previous years, which reflects the importance of the domestic property market, with another 31.0% attributable to investment in various machinery and equipment (See [chart 1.10](#)). Intellectual property products have also emerged as an important component of annual investment in Malta,

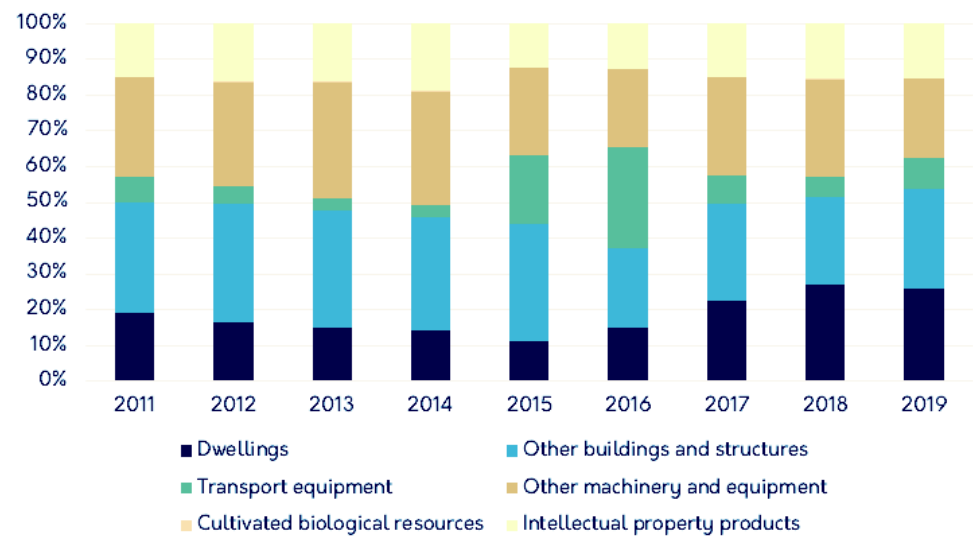
accounting for 15.0% of GFCF in 2019, mainly as a result of innovative activities in pharmaceuticals as well as ICT and gaming

**Chart 1.9 Gross fixed capital formation, % of GDP**



Source: Eurostat, 2020

**Chart 1.10 Gross fixed capital formation by type**



Source: Eurostat, 2020

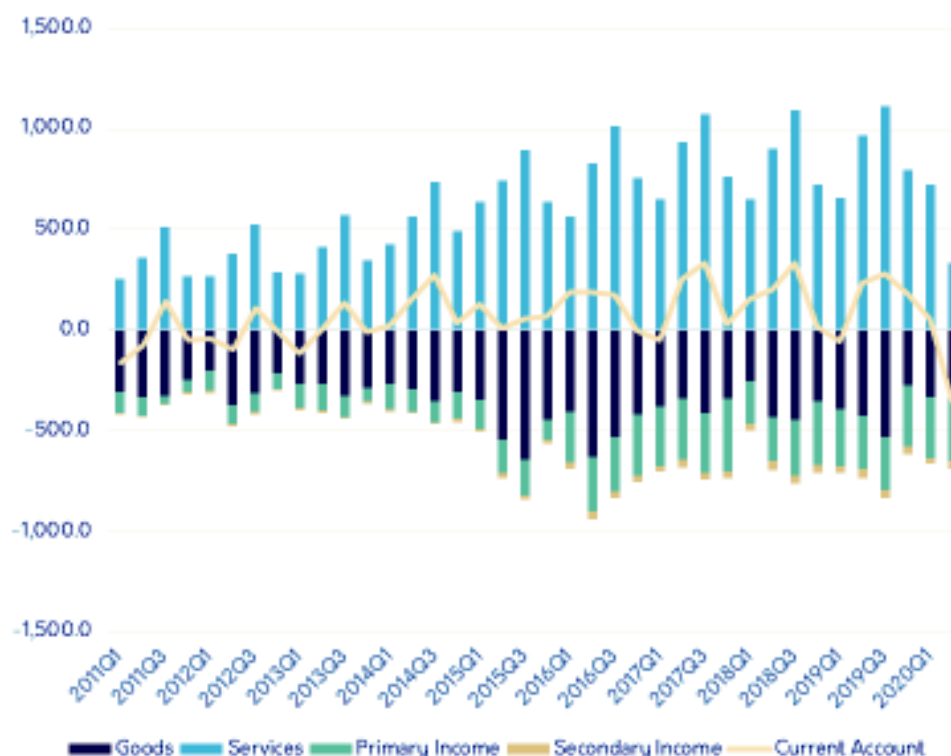
We now turn to foreign direct investment (FDI). The Maltese economy continues to rely heavily on FDI – Malta has the second largest stock of foreign asset holdings relative to GDP in the EU-27 at 1,523.0%, compared to an EU average of 379.0% (Eurostat, 2020), which further emphasizes the importance of FDI in Malta. In recent years, significant growth in FDI stock has been recorded in ICT and arts, entertainment and recreation (+3000% between 2014 and 2018), with the latter being driven by FDI within the gaming sector (Eurostat, 2020). Despite this trend, financial services still account for 97% of FDI stock in Malta (Eurostat, 2020).

### **1.1.6 International Trade**

The Maltese economy has always been characterized by its openness to international trade and commerce, due to its size and strategic location in the heart of the Mediterranean.

**Chart 1.11** provides a breakdown of the main components of Malta's current account within the Balance of Payments. Although the current account balance has occasionally dipped into negative territory, overall Malta has recorded consistent current account surpluses in recent years, mainly driven by strong growth in service-related exports from tourism and gaming. At the same time, the negative trade balance in goods has only experienced a moderate increase between 2011 and 2019, with import growth largely driven by increases in mineral fuels, lubricants and machinery and transport equipment. In addition, the negative primary income balance has quadrupled between 2011 Q4 and 2019 Q4, mainly driven by higher outflows in compensation to employees, reflecting the increased presence of workers within the Maltese economy, as well as investment income, which mirrors the high concentration of FDI domestically. Since the beginning of 2020, and the outbreak of COVID-19, Malta's current account balance has taken a downward turn, resulting in a deficit of €352.3 million in Q2 2020, reflecting a significant dip in service-related exports like tourism-related activities.

**Chart 1.11 Current account balance and components (Eur million)**



Source: Eurostat, 2020

### 1.1.7 Public Finances

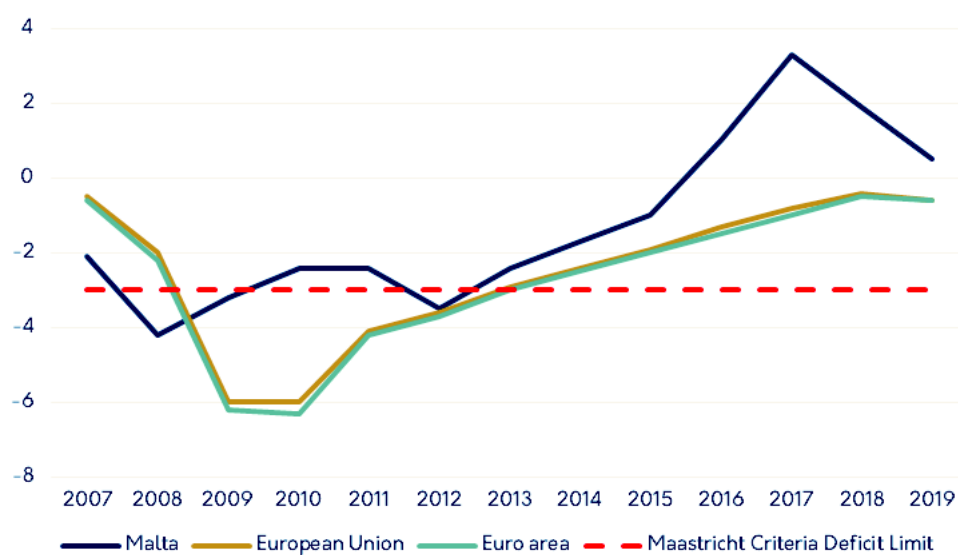
The state of a country's public finances is a critical element in its overall macroeconomic prosperity, not simply due to Euro Area mandated rules which help to mitigate the risk of sovereign debt default, but also as a buffer to support economic activity and employment during periods of instability. This stabilization role was brought into focus during the COVID-19 crisis, where fiscal policies aimed at softening the economic blow varied significantly across countries, largely based on the state of public finances within each country.

We start by analysing government deficit. Malta's general government balance has since 2016 entered surplus territory following several years of deficits, fuelled by increased government revenue and significant economic growth (See chart 1.12). Nonetheless, it is worth mentioned that over the period under review Malta's deficit has only ever exceeded the 3% Maastricht criteria threshold three times – in 2008, 2009 and 2012, with the first two attributable directly to the economic and financial crisis and



ensuing government support measures, and in all instances the extent of the exceedance was relatively small. Another noteworthy observation is the relatively rapid recovery in public finances following the 2008/09 economic crisis, mirroring the swift recovery experienced in the Maltese economy.

**Chart 1.12 Government deficit to GDP (%)**

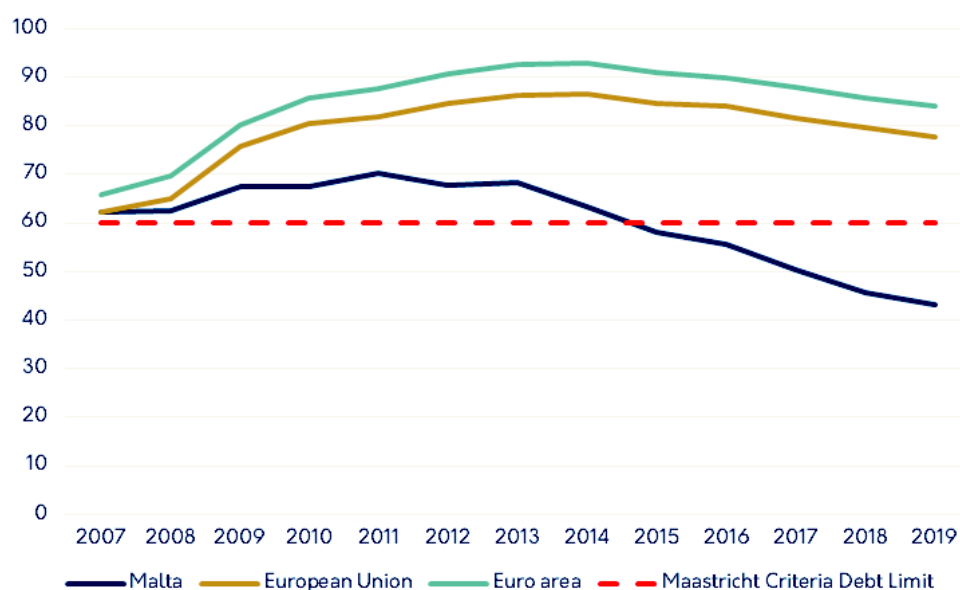


Source: Eurostat, 2020

This bodes well for the current situation, given that between January and August 2020 the Maltese government recorded a consolidated fund deficit of €1,086.1 million, an increase of €1,170.1 million relative to the surplus of €83.9 million recorded in the corresponding period in 2019, mainly due to higher expenditure and lower revenue resulting from the outbreak of COVID-19. Although the exact extent of the pandemic's impact on public finances is unknown, it is expected that the deficit to GDP ratio for 2020 will far exceed that recorded during the 2008/09 economic crisis, meaning that it may take some time before the government balance returns within the 3% deficit threshold, let alone surplus territory. It is worth pointing out that in March 2020 the European Commission activated the general escape clause within the Stability and Growth Pact, effectively suspending (temporarily) the Maastricht criteria requirements and any mandated adjustments towards medium-term budgetary objectives for Euro Area member states, in light of the extraordinary circumstances brought about by the COVID-19 pandemic.

When it comes to government debt, after several years of exceeding the Maastricht criteria's 60% debt-to-GDP threshold, since 2015 Malta has fallen within this limit, with the ratio continuing to fall in subsequent years, reaching 42.6% in 2019 (See chart 1.13). By contrast, on average both the EU-27 and EA-19 have never, over the period 2007-2019, recorded a debt-to-GDP ratio within the 60% threshold, although some improvements in terms of reining in debt have been recorded in more recent years. Once again, the likely impact of the COVID-19 crisis on government debt is at this stage unknown, although it is expected to increase substantially, with the government announcing its intention to fund the economic stimulus via domestic borrowing. In fact, the Central Bank estimates that the debt to GDP ratio is expected to rise to 55% by 2022 (Central Bank of Malta, 2020).

**Chart 1.13 Government debt to GDP (%)**



Source: Eurostat, 2020

### **1.1.8 COVID-19 response**

In light of the severe economic impact brought about by the COVID-19 pandemic and ensuing lockdown, including the closure of the Malta International Airport, the Maltese government has announced a series of stimulus measures in order to cushion the blow and enable the economy to recover as quickly as possible. The first set of measures were announced in March 2020. This includes around €780 million in loan guarantees for businesses, an estimated €245 million in wage subsidies for businesses and self-employed to support enterprises in retaining their employees, and deferrals for VAT, income tax and social security payments due in March and August 2020 (and between March and June 2020 for employee taxes). Other measures announced in this package include additional spending on healthcare, higher rent subsidies for the unemployed, interest rate subsidies on business bank loans as well as assistance for employers who had invested in teleworking systems for employees and an acceleration of tax refunds due to businesses. On the social side, a number of measures were introduced for individuals who were made redundant or who were unable to work. The parental benefit targeted working parents in the private sector, who could not go to work or carry out their functions through teleworking arrangements and were required to stay at home to take care of their school-aged children. The additional unemployment benefit scheme catered for employees who lost their jobs due to COVID-19. Moreover, the medical benefit scheme and the disability benefit scheme were granted to working disabled and vulnerable people who could not carry out their work functions due to being ordered to stay home for medical reasons.

On the 8<sup>th</sup> of June 2020, the Maltese government announced another comprehensive set of measures aimed at stimulating economic recovery. The package includes €400 million earmarked for infrastructural investment over the coming years, aimed at boosting productivity, an extension of existing tax deferrals and wage subsidy schemes, business subsidies for rent and electricity bills and various funds, grants and support schemes for businesses. The package also includes around €100.0 million in vouchers to each individual aged 16 and over, to be spent locally on accommodation, bars and restaurants as well as retail outlets, and a reduction in income tax and stamp duty on property sales until March 2021.

### 1.1.9 European context

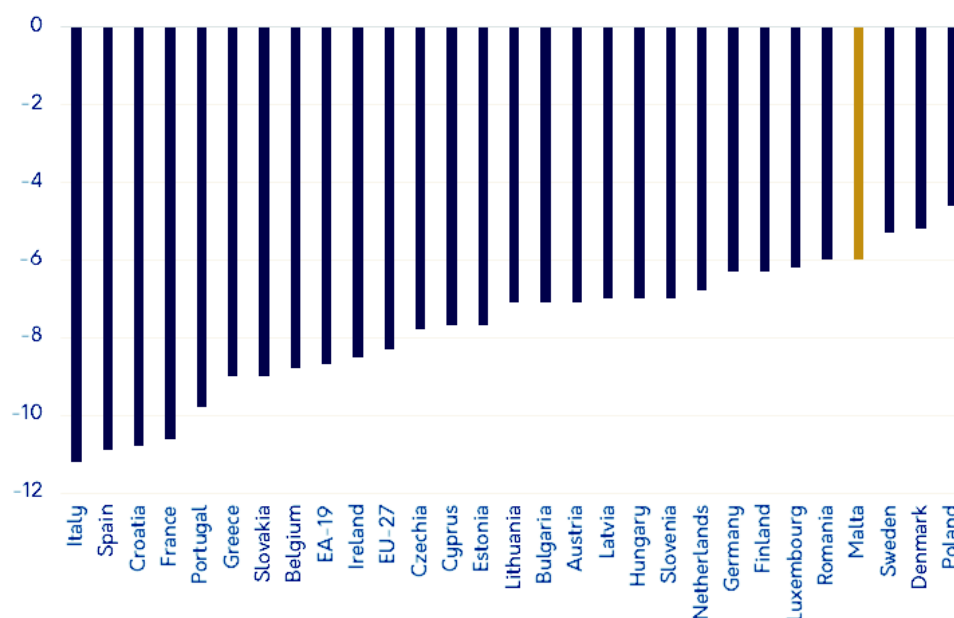
As a member state, it is imperative for Malta to keep track of economic and political developments within the European Union, since these will invariably have an important impact on domestic policy objectives. On the 17<sup>th</sup> of December 2019, the European Commission adopted the Annual Sustainable Growth Strategy for 2020, which lays out the key employment and economic goals for the EU over the coming years, as part of the new European Semester cycle. The Sustainable Growth Strategy is built on four key pillars, namely the environment, productivity, stability and fairness, with a renewed focus on the medium and long-term sustainability of the European economy and the welfare of its citizens.

The European Green Deal is at the heart of this strategy, aiming to create a climate neutral Europe by 2050 (enshrined in a proposed European Climate Law) whilst also developing a truly circular economy, with a particular focus on eliminating single-use plastics by 2030. The strategy also focuses heavily on digitisation, with a strong call for investment in relevant research and development and support for SMEs across the continent. There is also a clear mandate to strengthen and widen the scope of the Economic and Monetary Union in order to improve resilience to external shocks while promoting the international role of the Euro. Finally, the strategy discusses the importance of ensuring that this transition towards a greener, digital European economy is done in a just and fair manner, with a renewed focus on implementing the European Pillar of Social Rights and the establishment of a Just Transition Mechanism to assist workers and regions in facilitating this new social and economic transition envisaged in the Green Deal via investment and other support measures.

Predictably, the COVID-19 crisis has had a significant impact on all EU member states and the bloc, with widespread lockdowns and travel restrictions severely affecting the operation of the single market. The impact will also vary considerably across member states, [chart 1.14](#) depicts GDP growth figures for 2020 across the EU-27 and EA-19 based on the European Commission's Summer 2020 Economic Forecast, aptly titled, "A deeper recession with wider divergences." The forecasts range from Poland's modest decline of -4.6% to Italy's significant 11.2% predicted shrinkage, which is particularly worrying given the country's recent economic hardships and the perilous state of public finances. Such divergent outcomes will inevitably raise questions regarding the future of the European project. In particular, the Euro Area, given the importance of economic harmonization and the well-documented issues that surfaced

in the wake of the 2009 economic and financial crisis. In addition, the COVID-19 pandemic has also led to calls for greater solidarity across member states and a more coordinated, European response to tackle the ensuing recession.

**Chart 1.14 GDP growth forecast, 2020 (%)**



Source: EC, 2020

The first EU-wide support package was unveiled by the European Commission on 9 April 2020, valued at €540 billion. Among the list of measures is a new Pandemic Crisis Support instrument via the European Stability Mechanism (ESM) of up to EUR 240 billion, aimed at supporting EA-19 countries in financing healthcare, cure and prevention-related costs resulting from the COVID-19 pandemic, capped at 2.0% of each country's 2019 GDP. The package also includes €100 billion in temporary loans to assist EU member states in safeguarding jobs and support short-time work schemes and similar measures as part of the SURE initiative (Support to mitigate Unemployment Risks in an Emergency). In addition, on the 16<sup>th</sup> of March 2020 the European Investment Bank (EIB) announced a €40 billion package of financing to assist in dealing with the crisis, including guarantee schemes for banks, working capital assistance for SMEs and midcaps via direct liquidity lines for banks, and the purchase of asset-backed securities. Furthermore, the EIB will provide liquidity support of up to €200 billion to businesses across Europe, with a focus on SMEs.

On 27 May 2020, following a formal request by the European Council, the Commission proposed a new €750 billion instrument called Next Generation EU, intended to assist member states to recover from the pandemic-induced economic crisis. Embedded within the next long-term EU budget for 2021-2027, the recovery package is subdivided into €500 billion in grants and €250 billion in loans, and will be financed via a temporary lifting of the Commission's own resources ceiling to 2.0% of EU Gross National Income to enable increased borrowing on the financial markets. Notably, €672.5 billion of this facility will be dedicated to the Recovery and Resilience Facility which will aim for immediate economic recovery while also tackling the medium-long term economic weaknesses of member states. The Facility will target structural reforms and investments directly related to green and digital transformation, as well as the country-specific recommendations identified within the European Semester.

The European Central Bank (ECB) has also introduced its own set of monetary measures to assist Euro Area countries and the banking system in the midst of the pandemic. On 18 March 2020, the ECB announced a new €750 billion temporary asset purchasing programme for private and public sector securities, namely the Pandemic Emergency Purchasing Programme (PEPP), which will run until December 2020. The PEPP covers all asset categories defined under the existing Asset Purchase Programme (APP), which has also been bolstered by an additional €120 billion until the end of 2020, together with new waivers on exemptions. As part of this initiative, the ECB has also expanded the class of assets eligible for purchase under the APP's corporate sector purchase programme to include non-financial commercial paper, while also easing collateral standards and expanding the scope of additional credit claims to include corporate sector claims.

Therefore, it is clear that the European Commission and its key institutions have sought to respond to the COVID-19 crisis, with several initiatives and proposals in place to assist in both cushioning the blow and the eventual recovery. In particular, the Commission's flagship €750 billion Next Generation EU package has garnered significant attention, although at this stage (June 2020) it is yet to be approved by the member states. A particular point of contention concerns the financing of this package, both in terms of how the debt burden will be distributed across member states as well as the prospect of new carbon and digital taxes to finance the debt, which if levied at the EU-level would signify a new age of fiscal harmonisation. Also of note is the fact that the much of the instruments announced as part of this recovery package are linked

directly with the pursuance of green and digitization goals as outlined in the 2020 Annual Sustainable Growth Strategy and Green Deal, indicating that these overarching visions for the EU will continue to guide European policy in the medium term, despite the COVID-19 crisis. This also has important implications for the role of government, both at the national and supranational level, in ensuring a green and digital transformation with minimal negative side-effects, as well as enhanced resilience-building.

## **1.2 Developments in key sectors**

### **1.2.1 Tourism Related Activities**

Tourism has been one of Malta's principal drivers of economic growth and employment for the best part of 50 years, and although the sector has undergone substantial development and changes over time, its status remains undiminished. The tourism industry encompasses various subsectors, and for the purposes of this report will include accommodation and food service activities, rental and leasing activities, travel agency, tour operator reservation service and related activities, and sports activities and amusement and recreation activities.

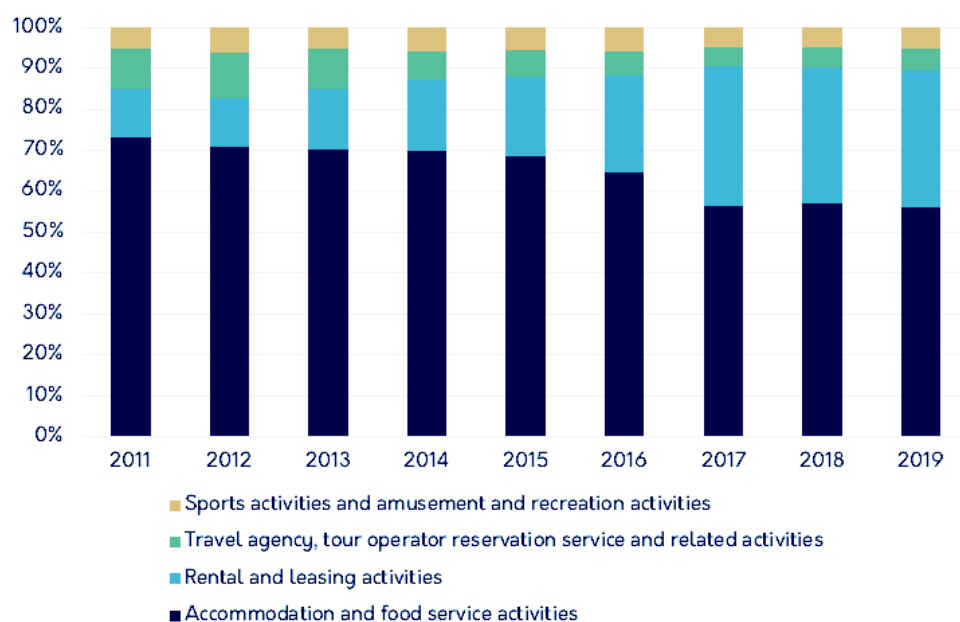
**Chart 1.15** shows that tourism-related activities have grown significantly in recent years, with an overall growth in GVA of 161.2% recorded between 2011 and 2019. From a sectoral perspective, the largest growth was recorded within rental and leasing activities, (+642.5%), fuelled by sustained growth in the private rental accommodation market, followed by sports activities and amusement and recreation activities (+161%), accommodation and food service activities (+99.8%) and travel agency, tour operator reservation service and related activities (+35.6%) (**See chart 1.16**).

**Chart 1.15 Gross Value Added in tourism related activities**



Source: Eurostat, 2020

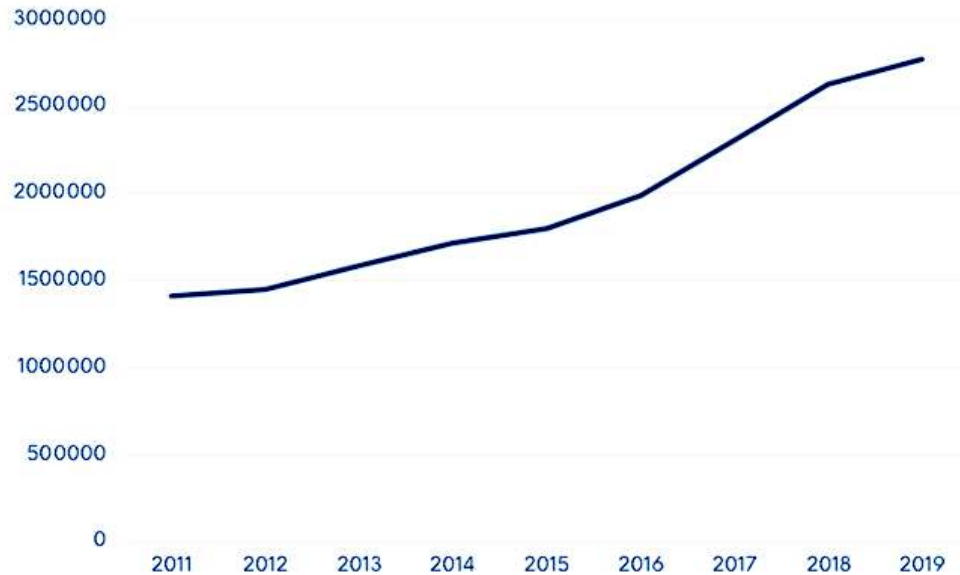
**Chart 1.16 Tourism related activities by sector**



Source: Eurostat, 2020



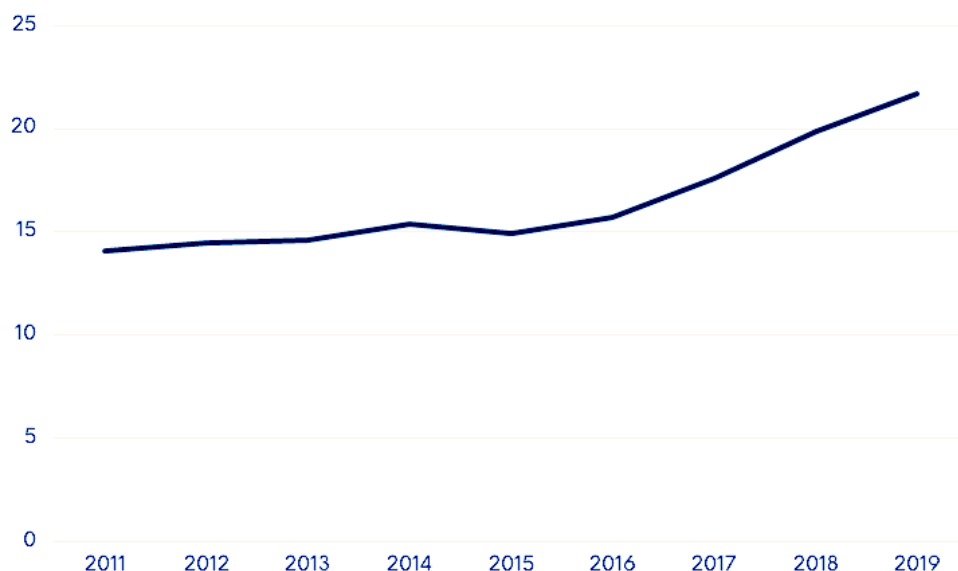
**Chart 1.17 Annual tourist arrivals**



*Source: Eurostat, 2020*

Predictably, employment within the tourism industry has also grown over the period under review, albeit at a slower pace than GVA. In fact, [chart 1.18](#) shows that employment growth of 54.0% was recorded over the period 2011-2019, driven largely by employment in sports activities and amusement and recreation activities (+92.0%) and accommodation and food service activities (+59.0%). Collectively, the tourism sector accounts for 8.7% of the gainfully occupied population in Malta, up slightly from 8.3% in 2011. In addition, accommodation and food services account for 13.1% of all EU workers and 15.3% of third-country nationals in Malta (JobsPlus, 2020).

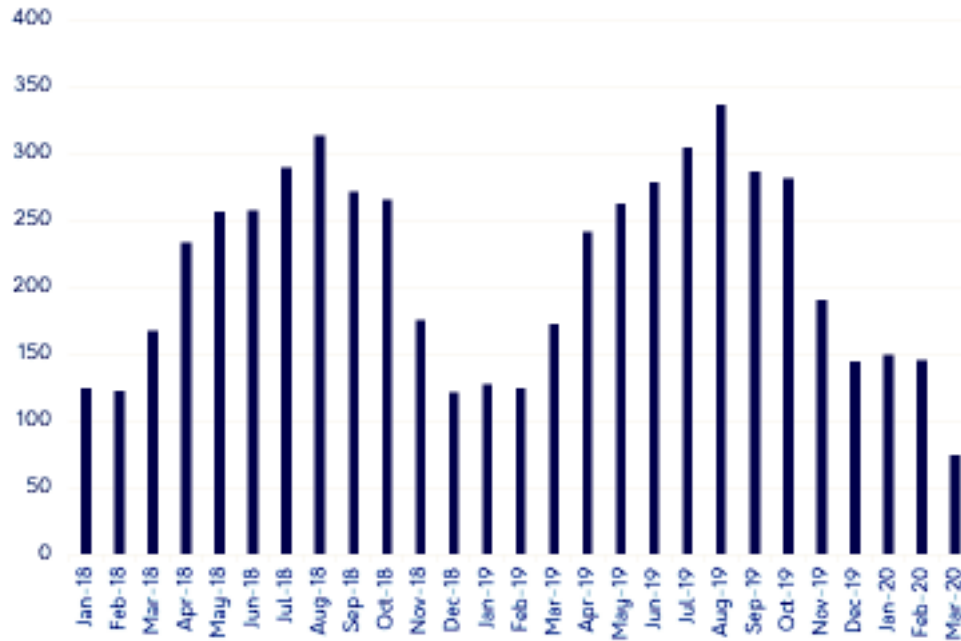
**Chart 1.18 Gainfully occupied – tourism related activities**



*Source: Eurostat, 2020*

The COVID-19 pandemic has had a devastating impact on tourism markets around the world, with lockdown measures, travel bans and widespread fear of infection decimating global travel. The immediate impact on the Maltese tourism sector is evident, as seen in [Chart 1.19](#), where tourist arrivals in March 2020 plummeted by 56.5% relative to March 2019, with the 75,157 arrivals representing one of the lowest monthly inbound tourist numbers recorded in the last 10 years, while tourist expenditure dropped by 62.6% over the same period. These low arrival numbers will be much lower in April, May and June 2020, with numbers picking up following the partial lifting of the travel ban on 1 July 2020 and subsequent full removal of travel restrictions on 15 July 2020. Nonetheless, recovery is expected to be slow amidst continued uncertainty regarding the pandemic, with arrivals expected to remain below 2019 levels over the coming two years. Therefore, the speed of recovery for the domestic tourism industry largely depends on the state of public health, both locally and abroad, and the widespread availability of the COVID-19 vaccine, once it is available.

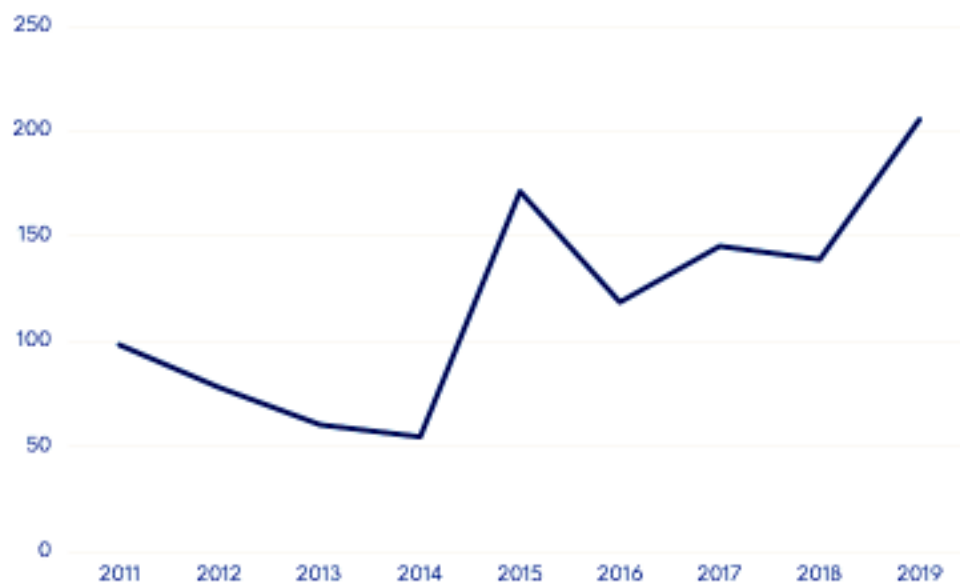
**Chart 1.19 Monthly tourist arrivals**



Source: Eurostat, 2020

In the short-run, the downside risk is clear, since tourist arrivals may drive up local infection rates, although there is limited evidence in this regard so far. Thus, the focus should be on ensuring the long-term survival of Malta's tourism industry, aided by the various government support initiatives targeted at reducing unemployment and solvency within the sector. This support is of particular importance since gross fixed capital formation expenditure in fixed assets within the accommodation and food service activities has been relatively high over recent years, reaching €206.1 million in 2019, particularly following the 2013 revision in the building heights policy, which allowed hotels in tourist zones to build up to an additional two floors in order to extend their capacity (See chart 1.20).

**Chart 1.20 Gross fixed capital formation in accommodation and food services (euro million)**

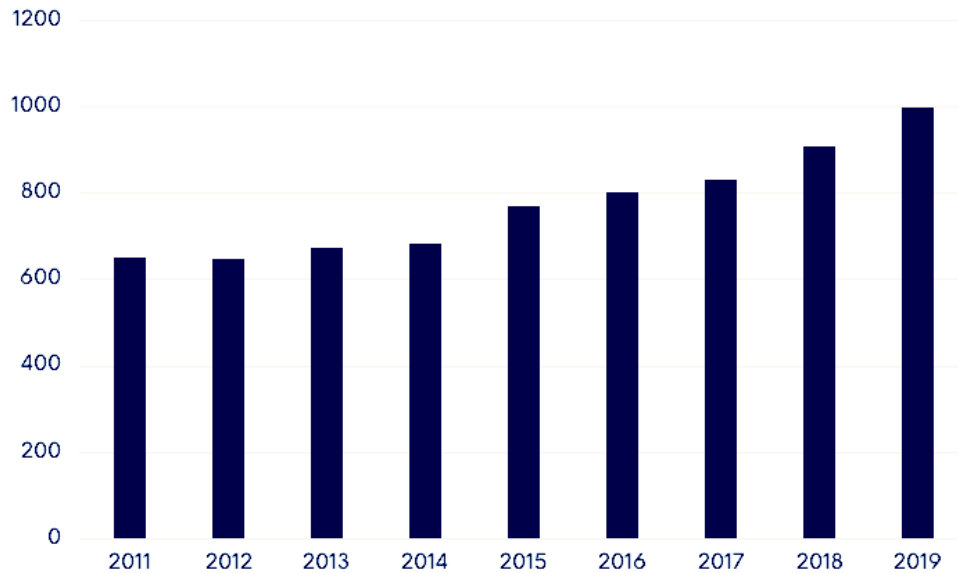


*Source: Eurostat, 2020*

### **1.2.2 Construction and Real Estate**

The construction sector has been a key pillar of the Maltese economy over the years. During the period 2011 to 2019 this sector has continued to flourish, growing by over 53.0%, particularly following the 2014 revision to the regulations governing building height ([See chart 1.21](#)).

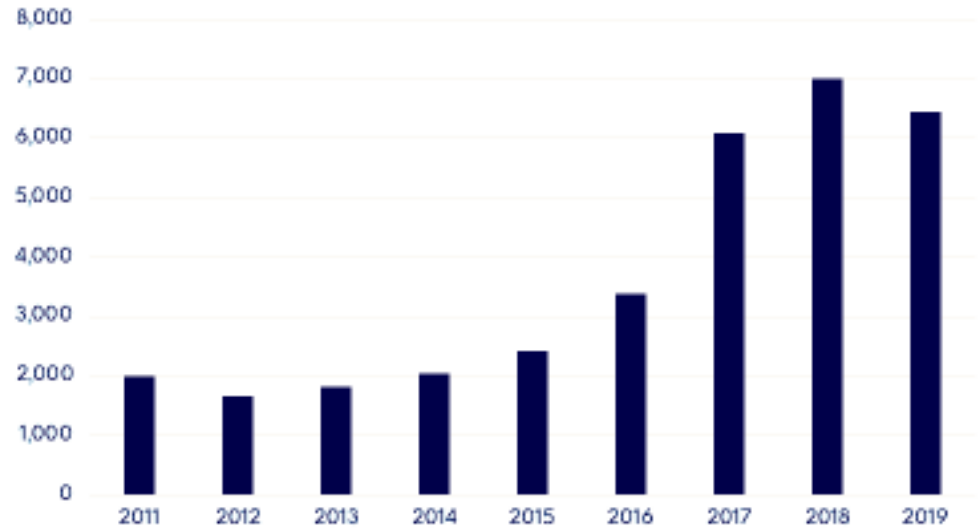
**Chart 1.21 Gross Value Added in construction and real estate (euro million)**



*Source: Eurostat, 2020*

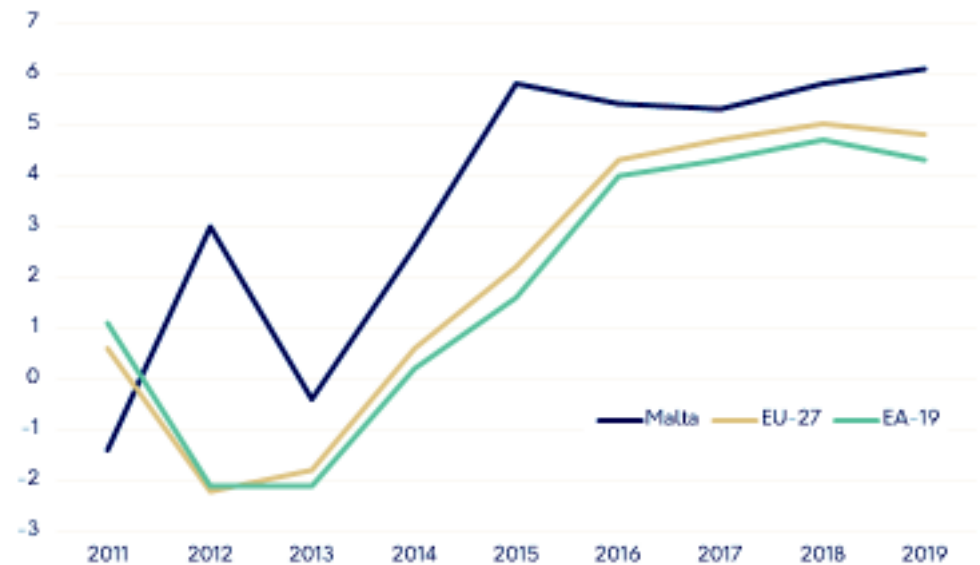
The extent of the growth within this sector is reflected in the number of new development permits issued per year, which as seen from [Chart 1.22](#) has increased from 1,991 in 2011 to 6,447 in 2019, an increase of 224.0%. Apart from the relaxation of building regulations, this boom in construction was also fuelled by significant growth in demand, mainly as a result of elevated levels of economic activity as well as higher numbers of foreign workers in Malta (Spiteri & von Brockdorff, 2020), resulting in a buoyant rental market. In fact, growth in house prices in Malta far outstripped that recorded in the EU-27 and EA-19 countries over the period under review, with average annual growth in prices estimated at 3.6% over 2011-2019, relative to 2.0% and 1.8% in the EU-27 and EA-19 respectively ([See chart 1.23](#)). Nonetheless, the contribution of construction and real estate to Malta's economy over this time period has fallen, from around 10.4% in 2011 to 7.7% in 2019, reflecting Malta's booming economic performance across several other key sectors.

**Chart 1.22 Annual Number of Development Permits issued in Malta**



Source: Planning Authority, 2020

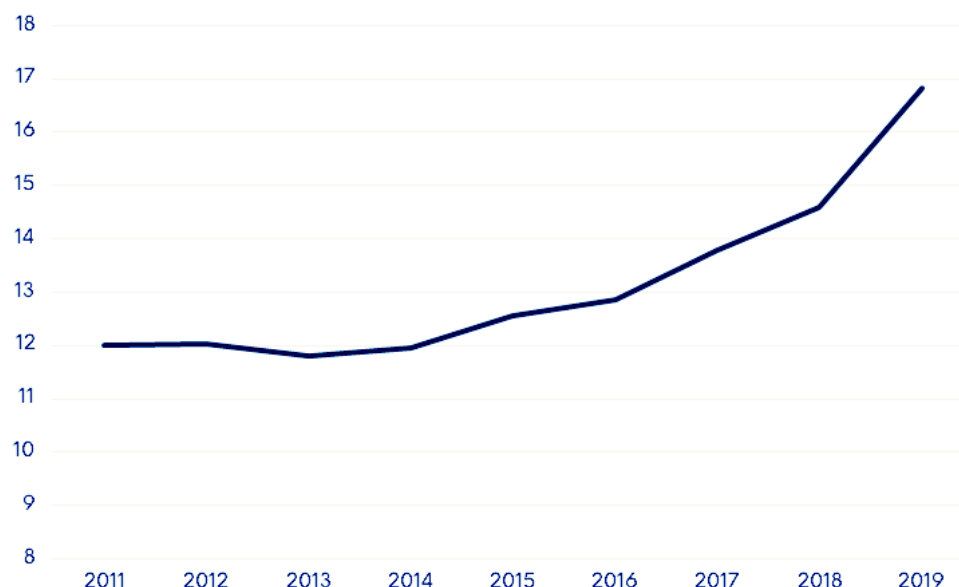
**Chart 1.23 Annual change in house prices (y-on-y % change)**



Source: Eurostat, 2020

Employment within the construction and real estate industry has largely mirrored the sector's economic performance, with gainfully occupied figures increasing by over 40.0% since 2011 (See [chart 1.24](#)). In total, this sector accounts for 6.8% of Malta's workforce, down slightly from 7.1% in 2011, mainly due to the emergence of other key sectors in the Maltese economy like gaming and professional services.

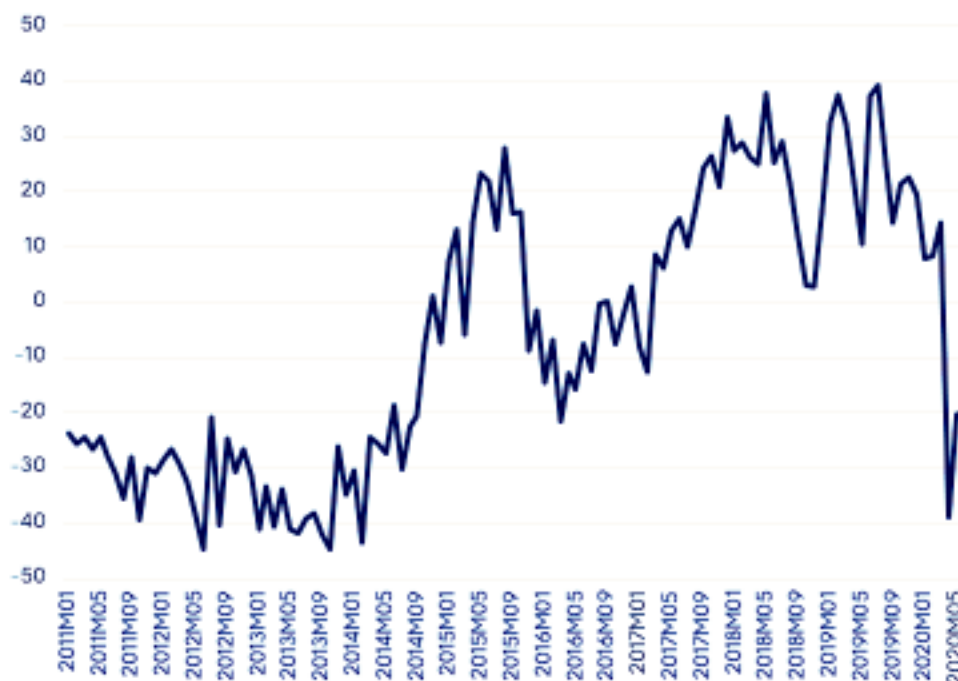
**Chart 1.24 Employment in Construction and Real Estate (Thousands)**



Source: Eurostat, 2020

The construction and real estate market experienced some disruption as a result of the COVID-19 crisis, albeit to a lesser extent than other sectors given that construction projects could continue despite the lockdown and containment measures introduced by the government. Nonetheless, the general slowdown in economic activity has dampened demand for real estate, while social distancing measures and the pandemic itself have limited the scope for property viewings, further eroding demand. This is seen from the construction confidence indicator in [Chart 1.25](#), which in April 2020 entered negative territory for the first time in three years, although sentiment has picked up somewhat in May and June 2020 as the crisis has abated and in response to the government's reduction in stamp duty and income tax on property sales.

**Chart 1.25 Construction Confidence Indicator**



Source: Eurostat, 2020

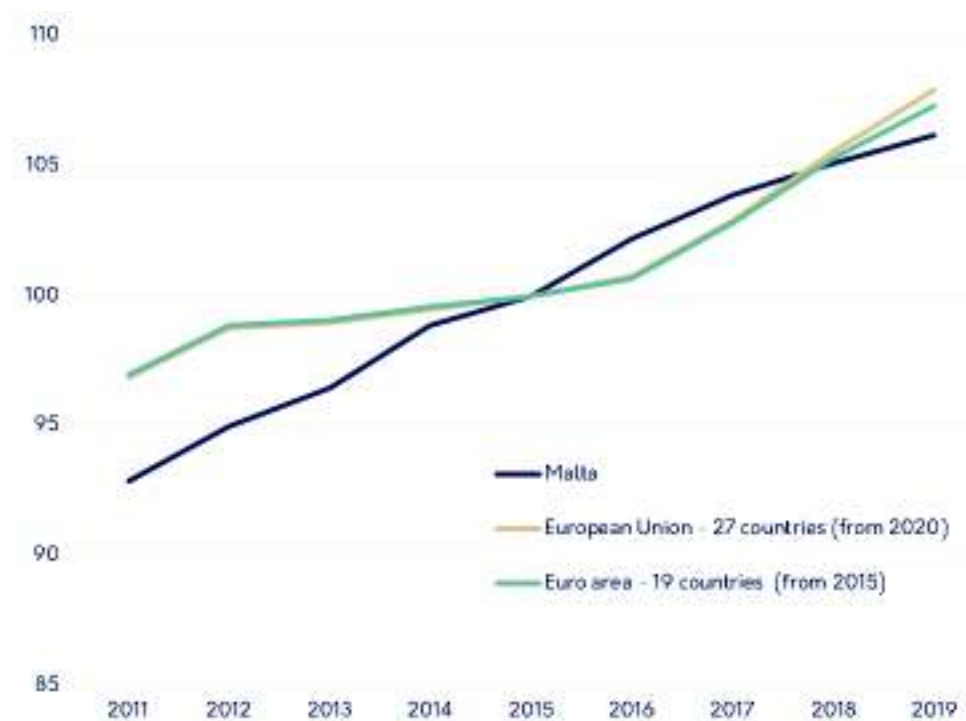
When it comes to property prices, in the first quarter of 2020 house prices in Malta increased by 5.6% relative to Q1 2019, which is above the EU-27 and EA-19 averages, while prices fell by 4.3% relative to Q4 2019, comparable to the same period last year when the drop was of 4.2% between Q4 2018 and Q1 2019. Nonetheless, it remains to be seen what the overall impact of the COVID-19 crisis will be on house prices and demand for property in Malta, particularly given the challenges faced by the industry pre-pandemic.

One of these challenges is the continued rise in construction costs, mainly fuelled by labour and materials costs, as observed in [Chart 1.26](#), with costs now catching up with those in the EU-27 and EA-19. These costs are likely to further increase as a result of the crisis due to delays in sourcing materials as well as the departure of many third country nationals in the wake of the pandemic, which may lead to labour shortages, quite apart from the ancillary impact on the rental market, which has been hit hard by the crisis. Another key challenge is waste management, with construction accounting for over 69.0% of total waste generated in Malta (Eurostat, 2020), with limited recycling or circular activity putting pressure on existing landfilling and disposal sites. These



issues assume even greater importance in light of the aforementioned rise in construction materials costs, since circular practices would encourage waste reduction and the reuse/recovery of construction waste, thus improving the operating efficiency of the sector. In addition, the EU has placed a greater focus on such waste streams as part of its Green Deal and Circular Economy Action Plan, meaning that in the medium-term the industry would be required to evolve and adapt a more circular approach. The Environment and Resource Authority's (ERA) recently launched Construction and Demolition Waste Strategy for Malta 2020-2025 should assist in this regard.

**Chart 1.26 Construction Cost Index (2015=100)**



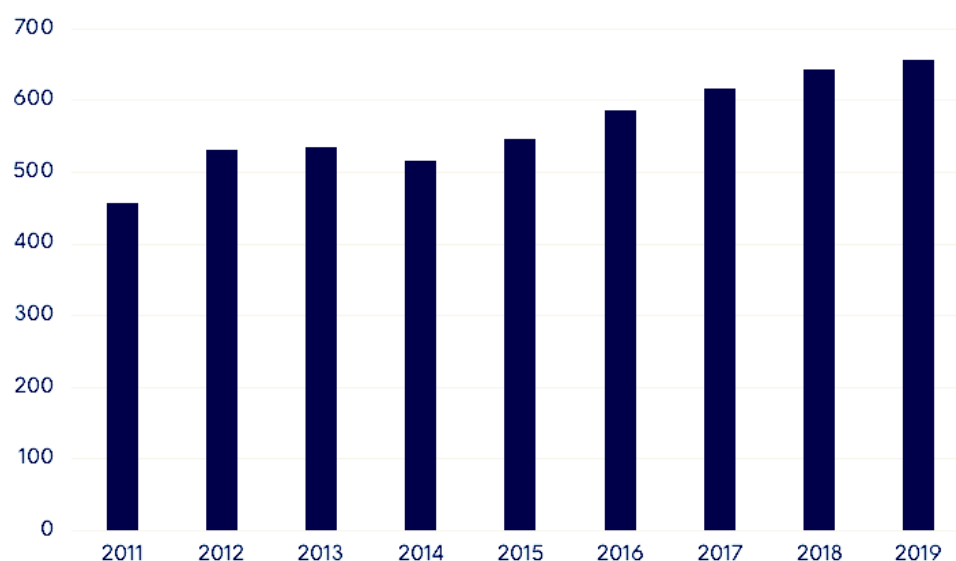
Source: Eurostat, 2020

### 1.2.3 Financial Services

Financial services have emerged as an important economic sector in Malta over the last 20 years, particularly following accession to the EU. In recent years the sector has continued to grow and develop, as seen in [Chart 1.27](#), with overall GVA growth of almost 44.0% between 2011 and 2019. This was mainly driven by insurance, reinsurance and pension funding, which more than doubled over the period under

review, with regulations governing the establishment of Protected Cell Companies (PCCs), the only such legal framework in the EU, assisting in attracting several captives and cell companies to Malta. Financial services also dominate the foreign direct investment (FDI) landscape in Malta, accounting for 77.8% of total FDI flows into the Maltese economy in 2018 and over 97.0% of the total value of FDI stocks in Malta (NSO, 2020), although annual inflows have levelled off in recent years. Perhaps surprisingly, the sector's overall direct contribution to the Maltese economy has fallen slightly, from 7.6% in 2011 to 5.5% in 2019, once again reflecting Malta's overall economic growth across several sectors. Nonetheless, it is worth pointing out that this only captures the direct contribution of financial services, with ancillary impacts collectively pushing this contribution upwards to around 9.0% (MFSA, 2020).

**Chart 1.27 Gross Value Added in financial services (euro millions)**

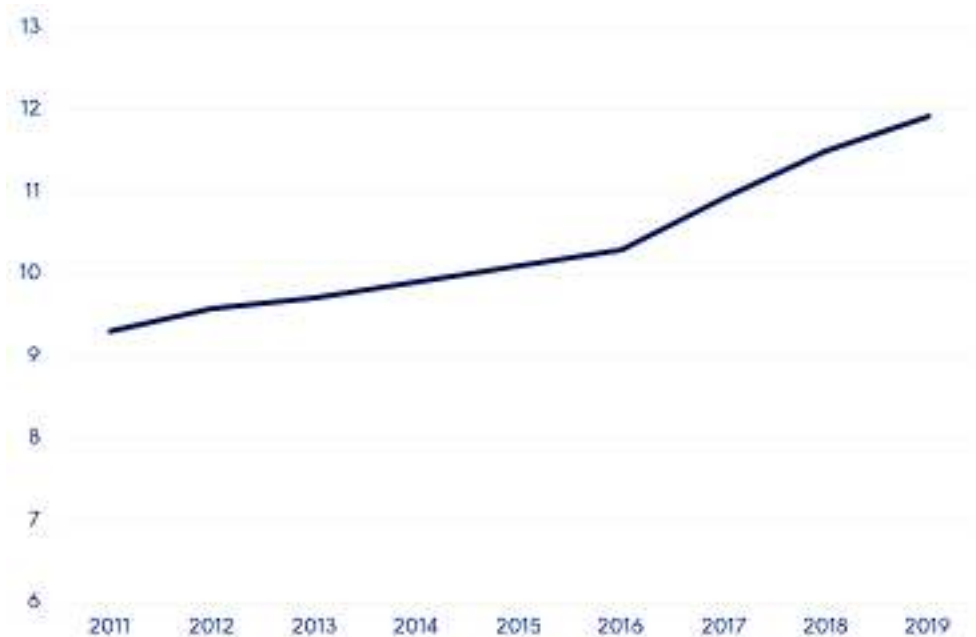


*Source: Eurostat, 2020*

Employment trends have broadly reflected the fortunes of the sector itself, as seen in [Chart 1.28](#), with growth of 28.1% recorded over the period 2011-2019, with the number of people working in insurance, reinsurance and pension funding almost doubling over this time period (Eurostat, 2020). In total, the sector accounts for 4.8% of Malta's total workforce, down slightly from 5.5% in 2011. The composition of the workforce within this sector has changed significantly over the period under review, as seen from [Chart 1.29](#), with the highest growth recorded within the 'professionals' occupational grouping

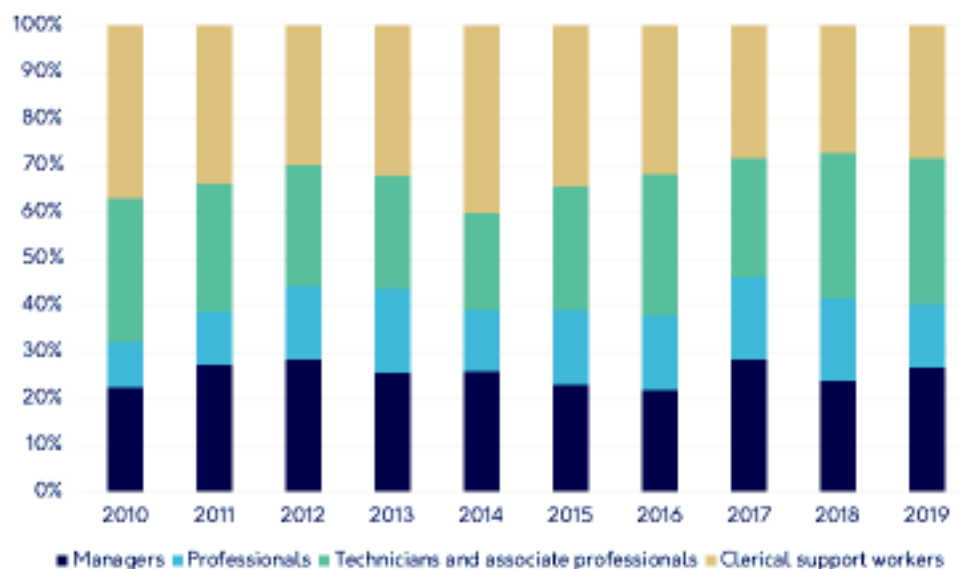
and technicians and associated professionals, with the latter accounting for over 31% of the total labour force within the sector. By contrast, the proportion of managers has remained largely unchanged at almost 27.0%, while the proportion of clerical support staff has fallen from 33.9% in 2011 to 28.6% in 2019. This shift in occupational composition reflects the development of the financial services sector as a whole, with higher levels of sophistication necessitating a greater reliance on high-skilled, technically competent labour force.

**Chart 1.28 Employment in Financial Services (thousands)**



Source: Eurostat, 2020

**Chart 1.29 Employment by Occupation, Financial Services**

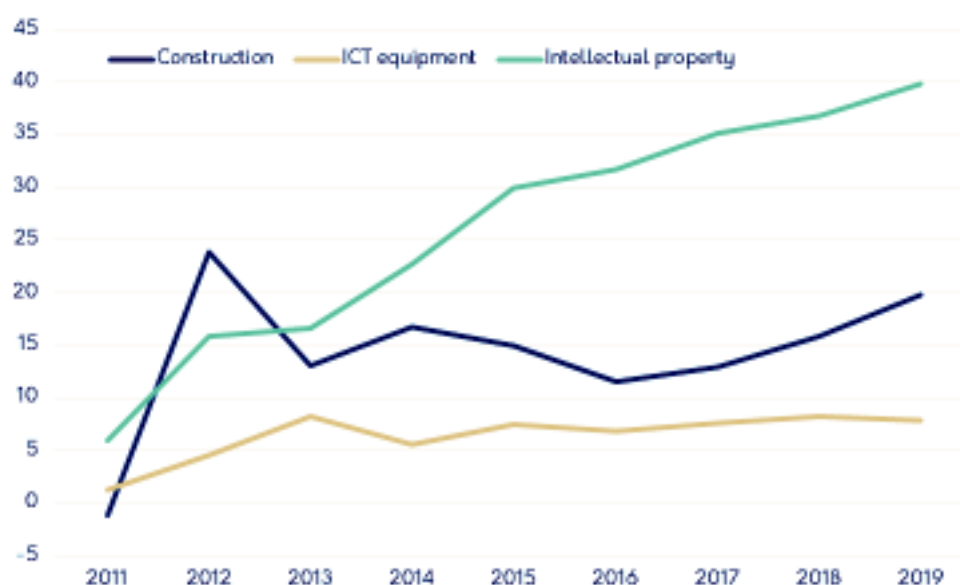


Source: Eurostat, 2020

The financial services sector is well-positioned to deal with the uncertainties and challenges brought about by the COVID-19 crisis in the short run, having successfully navigated the 2009 Great Recession and flourished thereafter. Owing to the nature of the services offered, the shift towards teleworking and remote services during the lockdown was relatively quick, with investment in digitization and FinTech already underway and likely to persist in the future. This is further observed in [Chart 1.30](#), where it is evident that in recent years, investment in both ICT and in particular intellectual property has increased significantly within the sector, with the latter emerging as the most important investment component since 2013 – a testament to the innovation and technical advancement of the sector, and a key contributor to its resilience. For banks and credit institutions, the short-term challenges revolve around liquidity and the ability of highly exposed clients to meet their debt obligations, while also providing liquidity to businesses. At the moment, liquidity within the domestic banking sector is solid, with total household deposits in financial institutions reaching €15.39 billion in May 2020, up from €13.78 billion in May 2019, while in Q1 2020 the loan to deposit ratio stood at 85.8%, compared to the 101.9% average recorded in the Euro Area, which further reflects the relative strength of the domestic banking sector liquidity (ECB, 2020). On the other hand, increased volatility in financial markets brought about by the pandemic and subsequent economic crisis will invariably have

an impact on a variety of financial services firms, particularly those involved in trading, pensions, investment and portfolio management services, while insurance and reinsurance operators may also be affected due to potential losses from investment returns (particularly those involved in life insurance), quite apart from increased claims.

**Chart 1.30 Gross Fixed Capital Formation - Financial Services (euro million)**



Source: Eurostat, 2020

In the long-term, another potential threat has emerged in the form of a putative EU-wide tax on financial transactions, in light of discussions surrounding the financing of the European Commission's upcoming budget via the Multiannual Financial Framework (MFF) and particularly the €750 billion COVID-19 recovery plan.

#### 1.2.4 Gaming

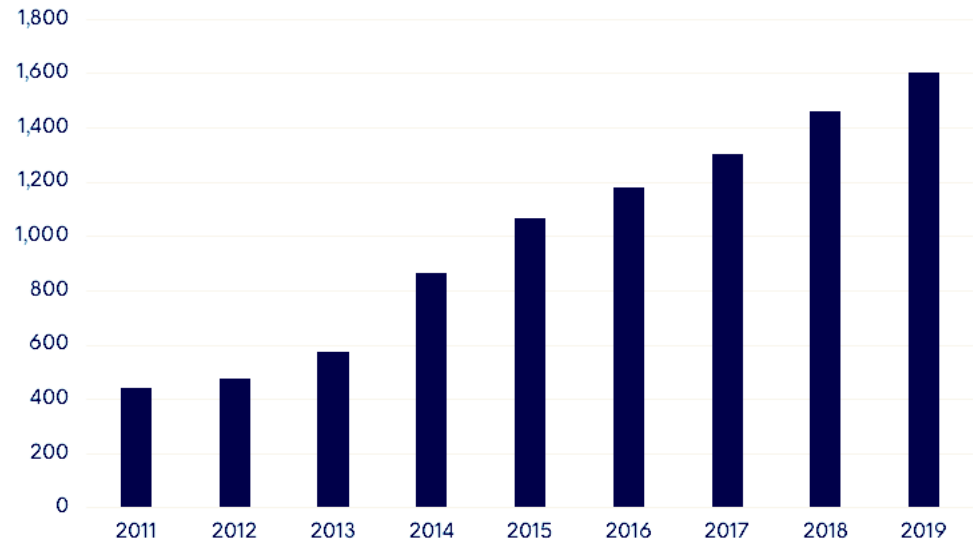
The gaming sector has emerged as one of Malta's key economic sectors in recent years, despite the relatively nascent nature of its presence in the country. This has largely been fuelled by the development of the iGaming industry, with Malta recognised as a global centre of excellence for iGaming activities since becoming the first EU country to regulate remote gaming in 2004. [Chart 1.31](#) shows annual GVA generated from creative industries, arts, entertainment; libraries, archives, museums and other cultural activities; gambling and betting activities, since gaming activities are bundled

under this category, accounting for the overwhelming bulk of GVA generated therein. As seen below, this sector has been on a steep upward trajectory in recent years, with growth reaching 263.7% between 2011 and 2019, by far the fastest-growing sector of the Maltese economy over this period. In fact, gaming now accounts for around 12.4% of Malta's economy, up from around 7.0% in 2011, reflecting its significance for the domestic economy, with 294 companies currently operating within this sector as at 2019 (MGA, 2020). Gaming also has notable secondary economic benefits via its impact on other important sectors like financial services and insurance, real estate, ICT and professional services.

Employment growth has been similarly impressive, as shown in [Chart 1.32](#), with the total workforce increasing almost threefold from 3,240 workers in 2011 to 9,120 in 2019. Indeed, gaming now accounts for 3.7% of Malta's total work force, up from 1.9% in 2011. The gaming sector has also attracted a large contingent of foreign workers, with 68.6% of the workforce consisting of EU and third-country nationals as at June 2019 (MGA, 2020), which further generates economic benefits in terms of higher demand for rental accommodation and consumption expenditure.

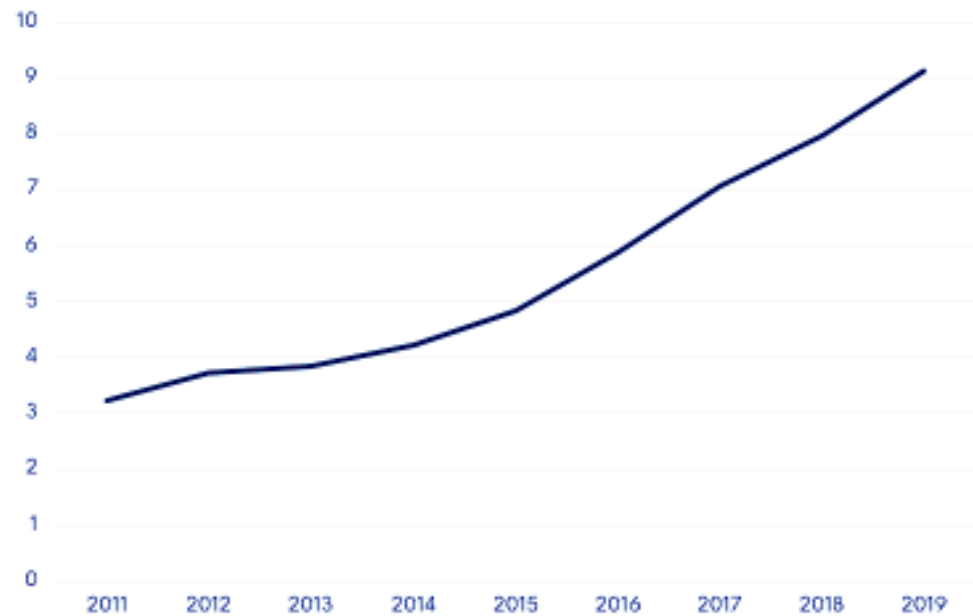
Various companies within the iGaming sector have successfully leveraged their digital systems in order to facilitate the transition towards remote working, thus limiting business interruptions. Nonetheless, a recent study conducted by the Malta Gaming Authority (MGA, 2020) found that revenues within the gaming sector are projected to fall by as much as 40.0% in 2020 relative to previous years, as a result of the COVID-19 pandemic, with around 36.0% of companies in the sector actively considering postponing their investments until the economic outlook improves.

**Chart 1.31 Gross Value Added, Gaming (euro millions)**



Source: Eurostat, 2020

**Chart 1.32 Employment in the gaming sector (thousands)**



Source: Eurostat, 2020

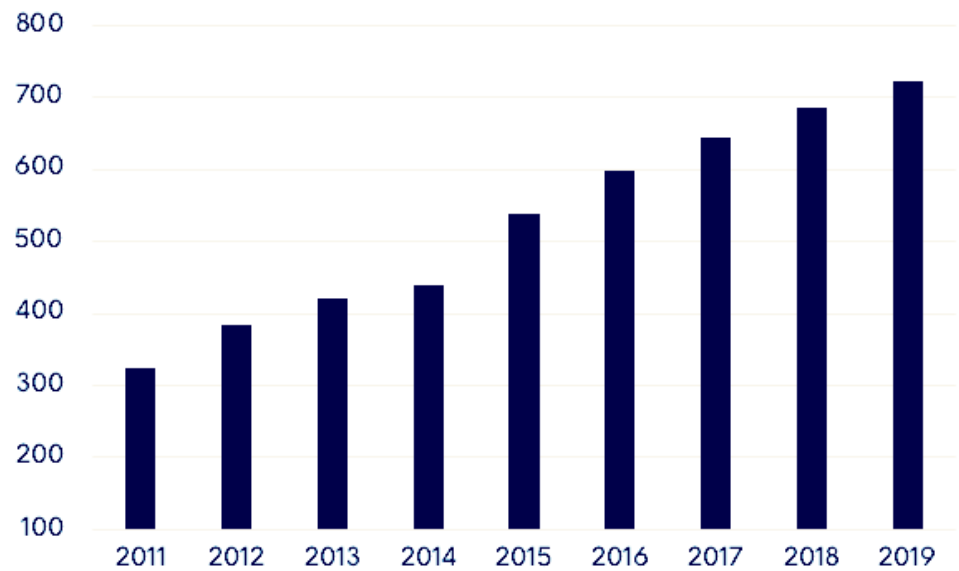
These pressures are expected to alleviate in the short run as competitive sporting events resume, and economic activity internationally picks up following the lockdown, although dampened demand may persist as economies struggle to recover, or re-enter lockdown due to a renewed outbreak. Beyond these realities, another persistent issue is the chronic skills shortage within the iGaming industry. A survey conducted by the MGA found that, as at the end of 2018, there were 730 unfilled job vacancies within the iGaming industry (MGA, 2019), equivalent to over 9.0% of the sector's workforce in 2018. This problem is likely to worsen following the COVID-19 crisis, with several foreign workers residing in Malta leaving the country.

### **1.2.5 Transport**

The transportation sector in Malta is highly diverse and multi-faceted, incorporating several sub-sectors including land, water and air transportation, warehousing and support services as well as courier and postal services. Thus, the transportation sector is a crucial cog within the Maltese economy, both within its own right as well as a supporting player to other sectors and industries. As seen in [chart 1.33](#), the transportation sector in Malta has experienced steady growth in recent years, growing by 72.0% between 2011 and 2019. In fact, the sector now accounts for 6.0% of Malta's total GVA, a slight increase from the 5.4% recorded in 2011. Over the period under review, notable growth was recorded in several key transportation sectors. While air freight traffic remained relatively constant, the number of air passengers has more than doubled between 2011 and 2019 ([See chart 1.34](#)). In addition, road freight transportation via trailers in Malta also recorded substantial growth, with traffic increasing by 52.0% between 2013 and 2018 in terms of volume transported (Eurostat, 2020), while the number of maritime passengers (including from cruise-liners) increased by 39.0% between 2011 and 2018 (Eurostat, 2020).

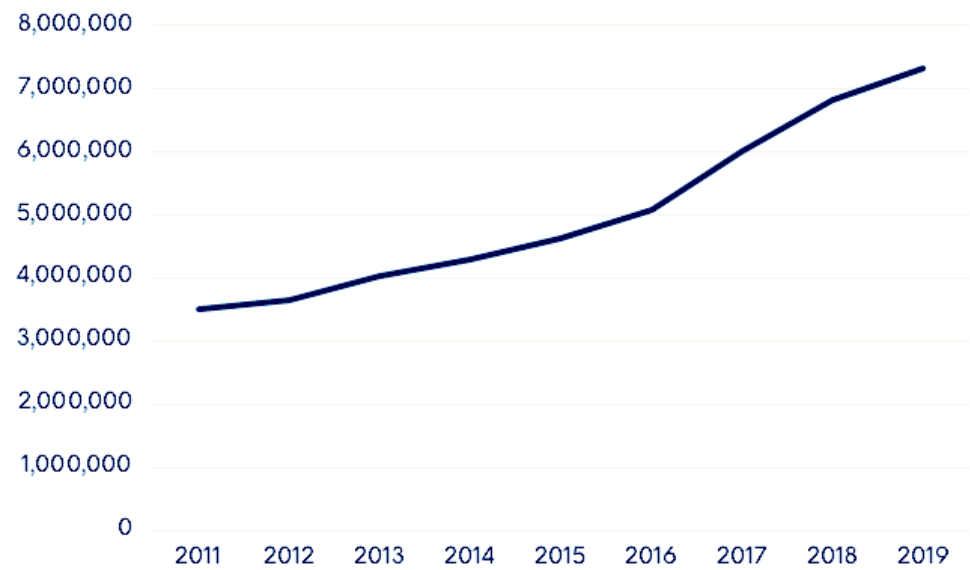


**Chart 1.33 Gross Value Added, Transport (euro millions)**



Source: Eurostat, 2020

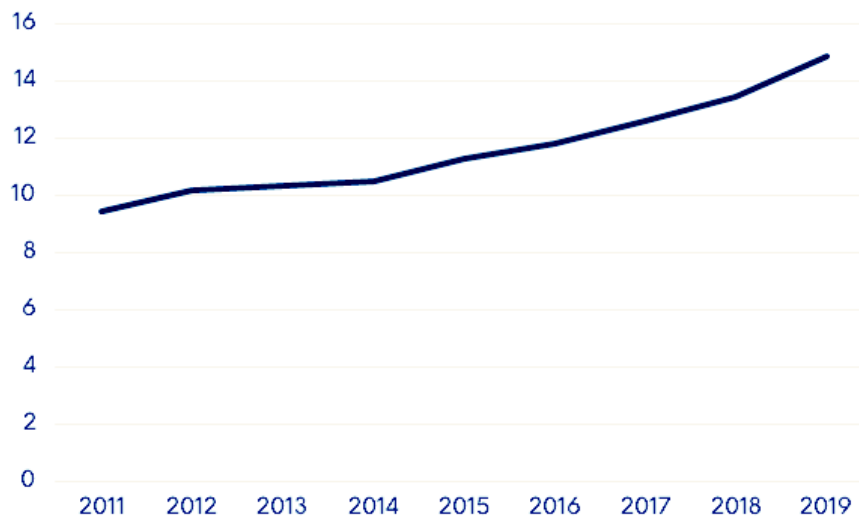
**Chart 1.34 Air passengers in Malta**



Source: Eurostat, 2020

When it comes to employment, as seen from [chart 1.35](#) the gainfully occupied population within the transportation sector has increased in line with GVA, growing by 57.4% between 2011 and 2019. The sector now accounts for 6.0% of the total labour force in Malta; an increase of 0.4 percentage points relative to 2011.

**Chart 1.35 Gainfully occupied population in transportation (thousand)**



*Source: Eurostat, 2020*

The transportation sector has been hit hard by the ongoing COVID-19 crisis, with these impacts likely to persist over the coming months due to reduced air and maritime travel, coupled with weaker demand conditions which are likely to affect freight and goods transportation. The airline industry has been ravaged by the crisis, with several leading airlines resorting to various measures including wage cuts and large-scale redundancies in order to keep afloat, with similar impacts observed at Air Malta. Another important challenge faced by the domestic road freight industry is the new Mobility Package, which was approved by the European Council in July 2020, and which is expected to have significant negative repercussions locally, mainly as a result of new rules on the return of vehicles as well as restrictions on cabotage, which may in turn raise freight costs. In the medium to long run, policies aimed at curtailing emissions from the transportation sector are likely to be ramped up, especially given the EU's climate goals as set out in the Green Deal for carbon neutrality by 2050. In particular, the prospect of an EU-wide climate tax on air travel has been raised, which would have a considerable impact on inbound and outbound air passenger traffic, while

the debate surrounding a carbon tax on global shipping has been going on for several years. In addition, discussions are already underway regarding the new Euro VII/7 emissions standards for heavy duty, light duty and passenger vehicles, which are expected to introduce even more stringent requirements when it comes to carbon dioxide, nitrogen emissions and fine particulate matter, while the Maltese government has already announced that it plans to ban the importation of diesel and gasoline powered vehicles by a specific cut-off date, which shall be announced by the end of 2020.

### **1.2.5 Wholesale and Retail**

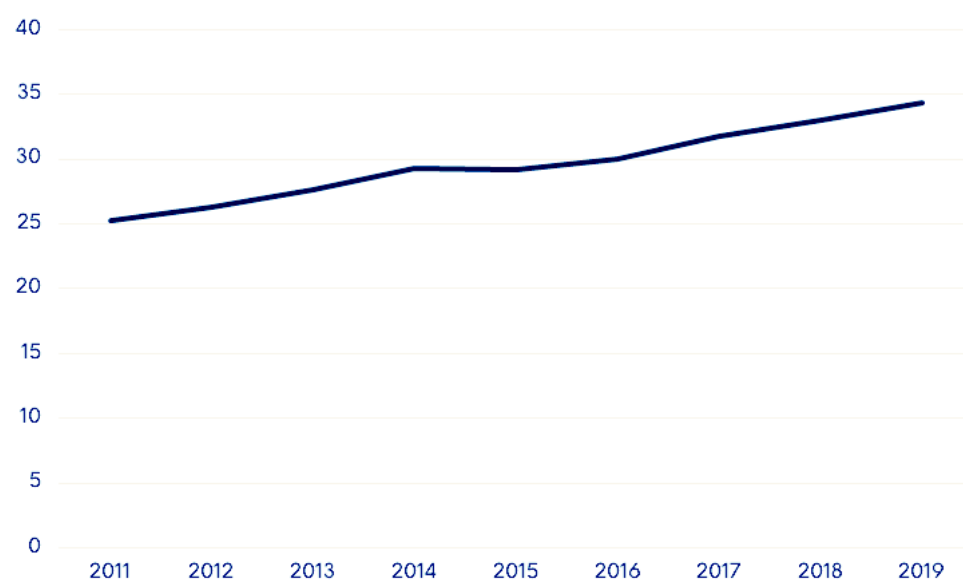
The wholesale and retail sector, as with any global economy, is an important driver of consumption activity within Malta, while also servicing key intermediate goods and services to a variety of other sectors. Since 2011, wholesale and retail has grown by around 70%, fuelled largely by the general upswing in economic activity within the country coupled with greater consumption demand from locals, foreign workers and tourists alike. Overall, the sector's relative contribution to Malta's GVA has remained fairly constant over time, dipping slightly from 11.4% in 2011 to around 10% in 2019 (See chart 1.36). When it comes to employment, growth in recent years has been steady, with the number of gainfully occupied individuals working within wholesale and retail increasing by approximately 36.0% between 2011 and 2019 (See chart 1.37). The sector is one of Malta's key employers, accounting for around 13.8% of the gainfully occupied population in 2019, down slightly from 15.0% recorded in 2011.

**Chart 1.36 Gross value added in wholesale and retail (euro millions)**



Source: Eurostat, 2020

**Chart 1.37 Gainfully occupied population in wholesale and retail (thousand)**



Source: Eurostat, 2020

In the immediate term, the wholesale and retail sector is grappling with the ramifications of the COVID-19 pandemic and lockdown measures, which also entailed

the forced closure of several non-essential retail outlets, although these measures were partially lifted in May and fully reversed in June 2020. Nonetheless, the impact on the sector has been significant, as seen from [Chart 1.38](#), with monthly turnover from wholesale and retail activities plummeting by 10.3% in March 2020 and 24.2% in April 2020 compared to the corresponding months in the previous year, with the latter representing the largest drop in turnover this decade.

Predictably, business sentiment among operators within this sector is low, with the retail trade confidence indicator for Malta reaching -22.3, -31.7 and -43.2 percentage points in March, April and May 2020 (EC, 2020), although sentiment has improved somewhat in June 2020 at -30.1, reflecting a less pessimistic outlook for business conditions over the coming three months. Consumer confidence, which is crucial in terms of driving economic activity within this sector, has also dipped into negative territory, plateauing at -15.8 percentage points in April 2020 before picking up in subsequent months, reaching -6.9 in June 2020. The Maltese government has explicitly acknowledged the difficulties faced by the wholesale and retail sector as a result of the pandemic, launching various support measures including its wage supplement scheme as well as the issuance of €20 vouchers to households which can be spent at retail outlets across the country in an effort to boost turnover.

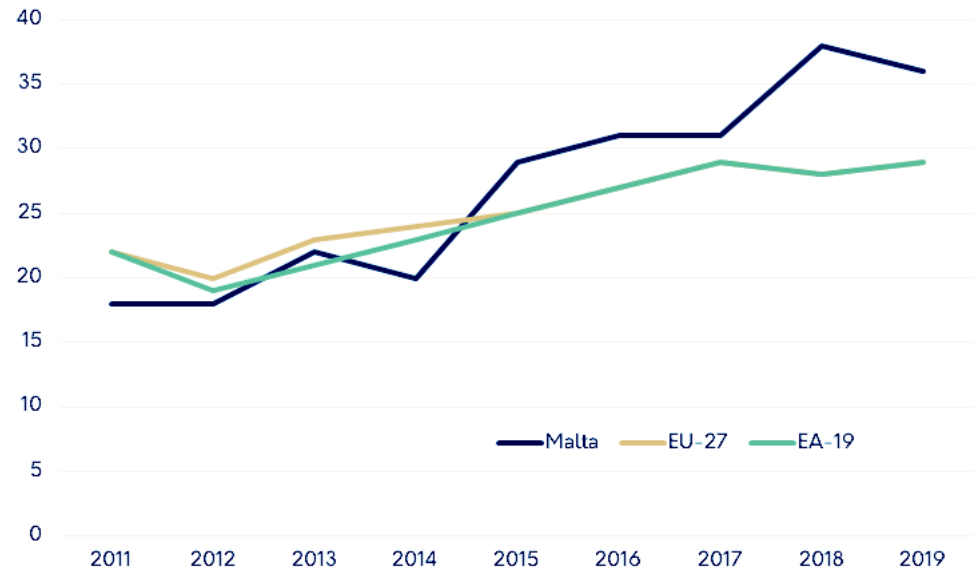
The ongoing crisis has served to highlight the continued importance of digitization within the wholesale and retail sector, which even before the crisis was a key issue and which during lockdown served as a vital cog to business continuity. Hence, continued investment in digital technologies, and e-commerce platforms, remains a top priority for this sector, not simply as a business survival tool but as a driver of sales and a platform to unlocking new potential markets both domestically and abroad. In this regard, although gross fixed capital formation within the wholesale and retail sector has remained fairly flat over the period 2011 to 2019, as seen in [Chart 1.39](#) a growing number of operators within this sector are now equipped with e-commerce facilities for online shopping, with 36.0% of businesses now offering such services in Malta, higher than the EU-27 and EA-19 averages of 29.0% apiece. Hence it appears as though Maltese wholesalers and retailers are embracing digital technologies and improving their online presence.

**Chart 1.38 Wholesale and retail turnover (% change y-on-y)**



Source: Eurostat, 2020

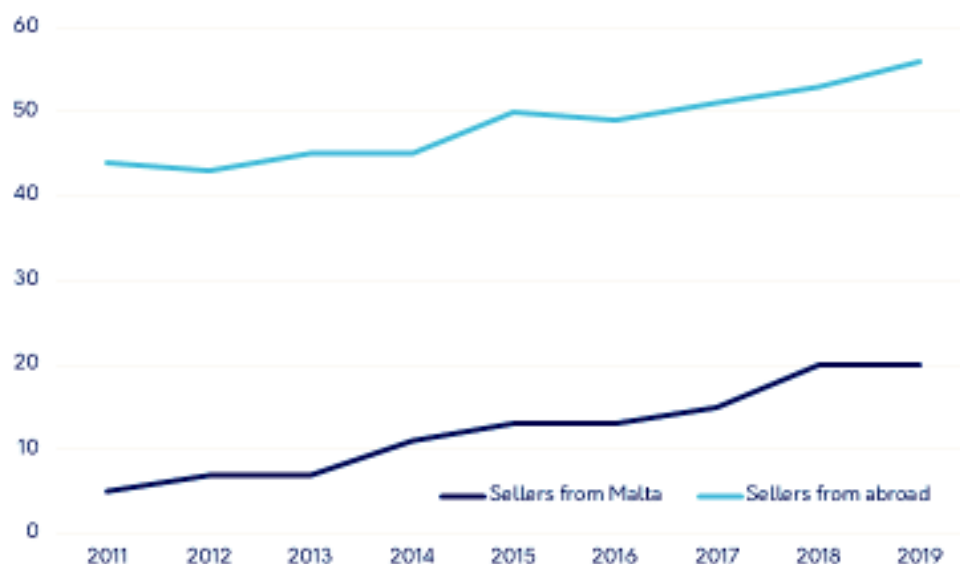
**Chart 1.39 Wholesale and retail enterprises with online shopping facilities (%)**



Source: Eurostat, 2020

However, only 23.0% of enterprises within the wholesale and retail sector in Malta reported e-commerce sales in 2018, compared to 30.0% in the EU-27 and 31% in the EA-19 (Eurostat, 2020). This shows that, despite the investment, domestic business operators are lagging in terms of utilizing the full potential of e-commerce as a viable tool to drive sales. In fact, as shown in chart 1.42, whereas 56.0% of the Maltese people in 2019 engaged in online purchases from sellers abroad (both EU and non-EU countries), only 20.0% purchased online from domestic sellers. This points towards another important challenge faced by the industry, namely competition from international operators who are using e-commerce and other digital technologies to reach a wider international market, including Malta. Thus, it is evident that Maltese enterprises within the wholesale and retail sector must do more in terms of investing in a wide suite of digital technologies, including marketing and logistics, in order to widen their customer base and improve their competitiveness.

**Chart 1.40 Internet purchases (% of population)**



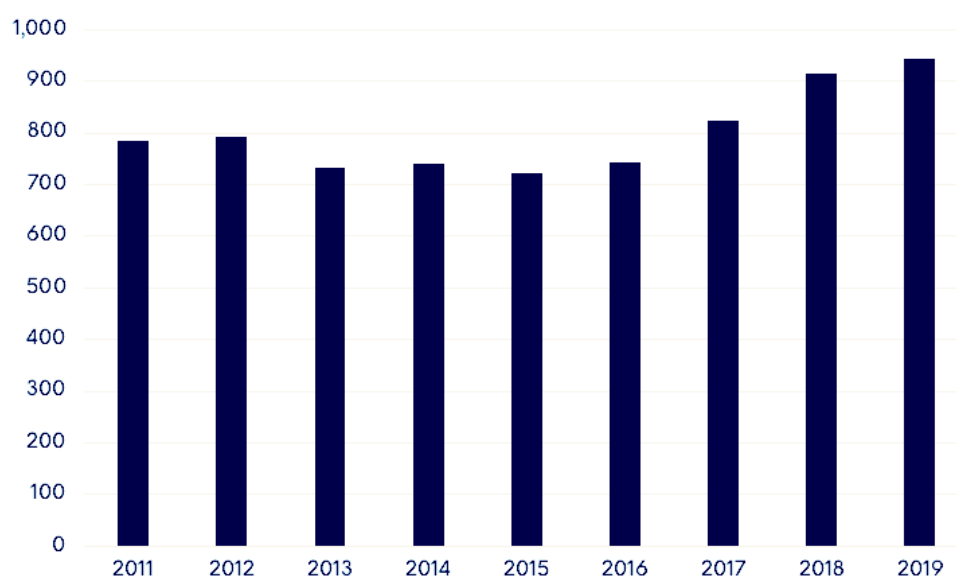
Source: Eurostat, 2020

### 1.2.6 Manufacturing

The manufacturing sector is one of Malta's traditional economic pillars, and despite its reduced importance due to the country's shift towards more service-oriented sectors, the industry is still a significant contributor to economic prosperity, undergoing

significant changes over the last 20 years with a greater focus on higher value-added manufacturing. The manufacturing sector in Malta has grown by 20.4% between 2011-2019, with an annual average growth rate of around 2.6%, despite a slight dip in 2013 and 2015 (See chart 1.41). Hence, although the sector has experienced steady growth in recent years, it has lagged other sectors in Malta like financial services and gaming, which have propelled the Maltese economy, reflecting manufacturing's diminished economic role. In fact, whereas in 2011 the sector accounted for 13.2% of Malta's total GVA, this has fallen to 8.0% in 2019 (Eurostat, 2020).

**Chart 1.41 Gross value added in manufacturing (euro millions)**



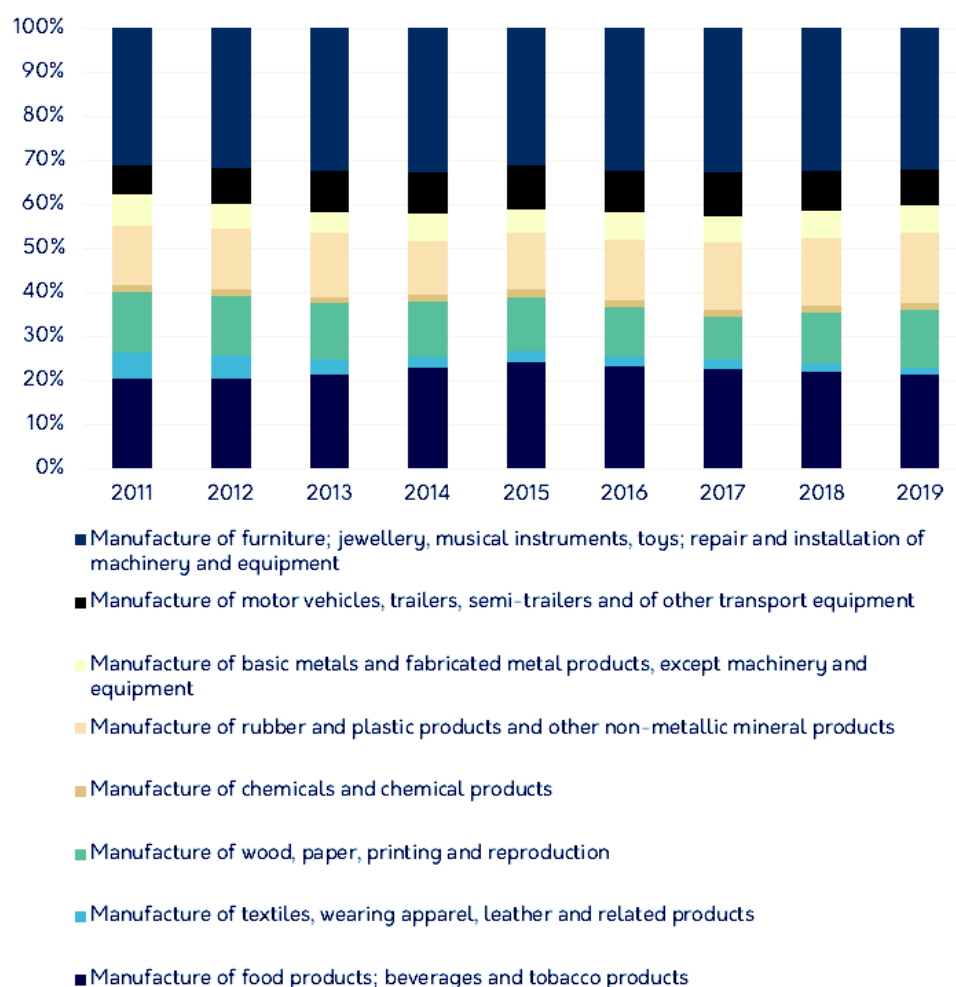
Source: Eurostat, 2020

Chart 1.42 provides a breakdown of the different components of manufacturing and their individual contributions to GVA. As seen below, over the period under review the largest growth in GVA was recorded in the manufacture of motor vehicles, trailers, semi-trailers and other transport equipment (81.4%), followed by the manufacture of rubber, plastic products and other non-metallic mineral products (79.9%). All the individual components of domestic manufacturing experienced growth over the period under review, apart from textiles, wearing apparel, leather and related products, which shrunk by 56.2% between 2011 and 2019. The largest component of Maltese manufacturing continues to be the manufacture of furniture, jewellery, musical instruments, toys; repair and installation of machinery and equipment, accounting for



25.9% of the sector's GVA in 2019, followed by the manufacture of food products, beverages and tobacco products (17.3%).

**Chart 1.42 Manufacturing gross value-added breakdown**

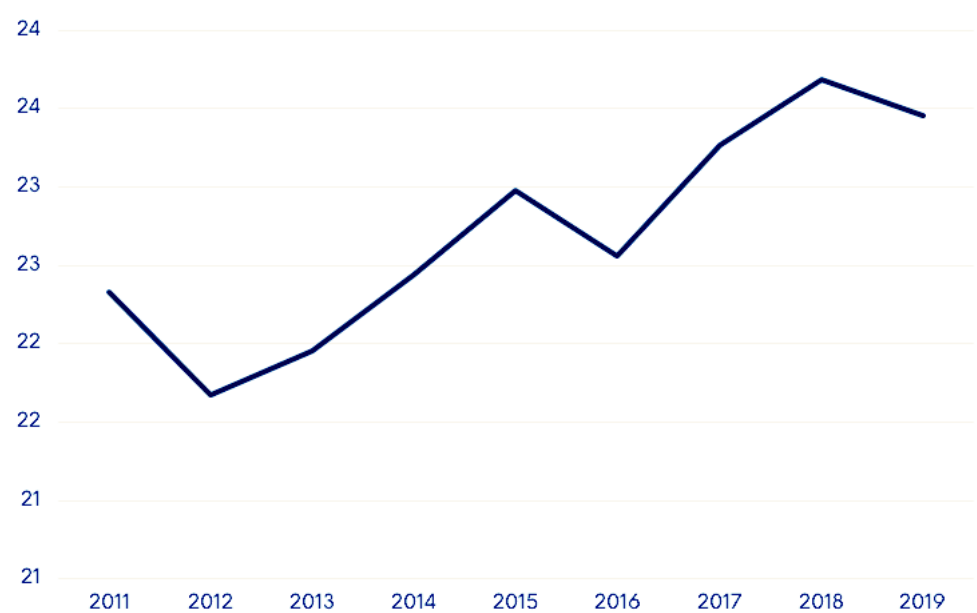


Source: Eurostat, 2020

When it comes to employment, as seen from [Chart 1.43](#) growth has been somewhat modest, with an increase of only 5.1% recorded for the period 2011 to 2019 – an annual average growth rate of 0.6%, with decreases recorded in 2012, 2016 and 2019. When considered in light of GVA growth, it is evident that the manufacturing sector is managing to generate higher levels of output and value from each worker, reflecting this shift towards higher value-added manufacturing. Predictably, the sector now accounts for an increasingly-smaller proportion of total employment in Malta – in fact,

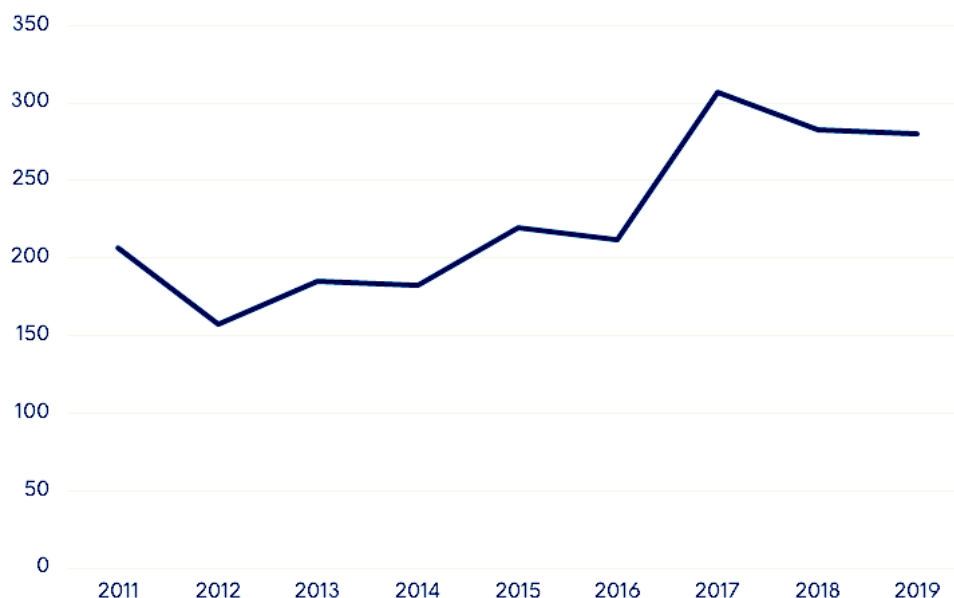
this has fallen from 13.2% in 2011 to 9.4% in 2019 (Eurostat, 2020). Nonetheless, the sector still manages to attract significant investment, gross fixed capital formation within manufacturing has grown by over 35.0% between 2011 and 2019, despite a recent levelling-off in 2018 and 2019 (See chart 1.44). In addition, foreign direct investment (FDI) has also increased in recent years, with a stock of €1.06 billion in foreign assets in the manufacturing sector as at June 2019, compared to EUR 994.7 million in June 2018 (NSO, 2020).

**Chart 1.43 Gainfully occupied population in manufacturing (thousands)**



Source: Eurostat, 2020

**Chart 1.44 Gross fixed capital formation in manufacturing (euro millions)**



*Source: Eurostat, 2020*

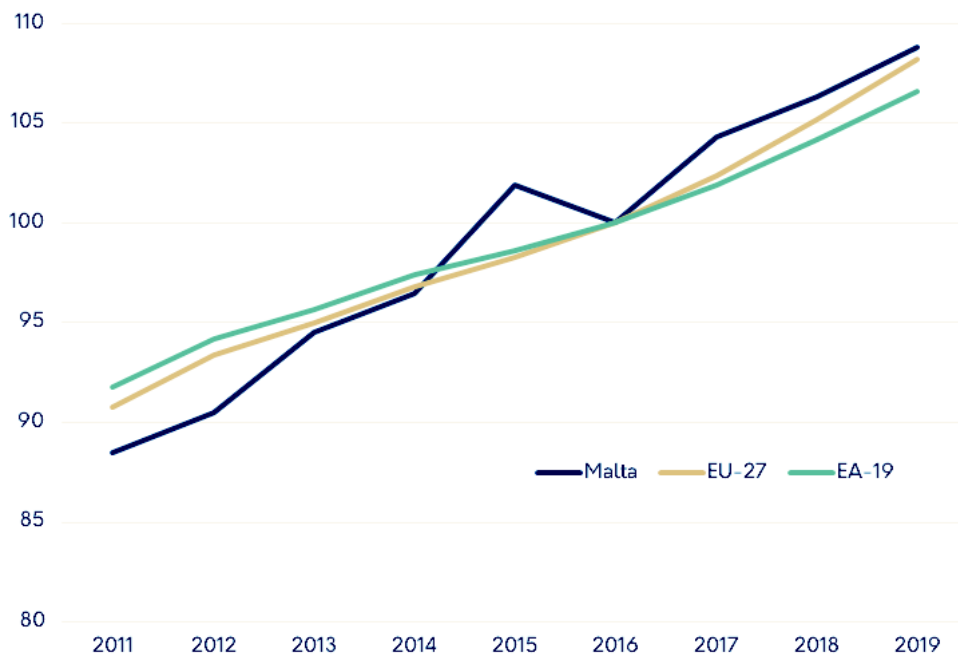
The outbreak of COVID-19 has predictably had a significant impact on business operations and conditions within the manufacturing sector, via a dampening of demand conditions due to economic slowdown, delays and difficulties in procuring raw materials from overseas, as well as production disruptions and adjustments due to social distancing requirements. The latest data indicates that industrial production during April and May 2020 fell by 7.4% and 4.6% respectively (NSO, 2020), which attests to the short-term impact of COVID-19, and it remains to be seen how long it will take for operations to return to pre-crisis levels. In effect, the pandemic has served to underline the myriad challenges faced by the manufacturing sector in Malta in the medium to long term.

A key issue is related to competitiveness, in the face of rising costs and stronger international pressures. [Chart 1.45](#) depicts the labour cost index for the manufacturing sector in Malta, relative to the EU-27 and EA-19. As seen below, Malta's labour cost index has risen significantly over the period 2011 - 2019, and is now slightly above the EU-27 and EA-19 average. Furthermore, [chart 1.46](#) also shows that Malta's output price index for manufacturing is also significantly above that reported in the EU-27 and EA-19, reflecting higher output prices for Maltese manufacturing products. Thus, rising

production costs must be tackled decisively in order to enhance the competitiveness of the domestic manufacturing sector, a challenge that is heightened by Malta's geographical realities which lead to higher transportation costs for both inputs and output.

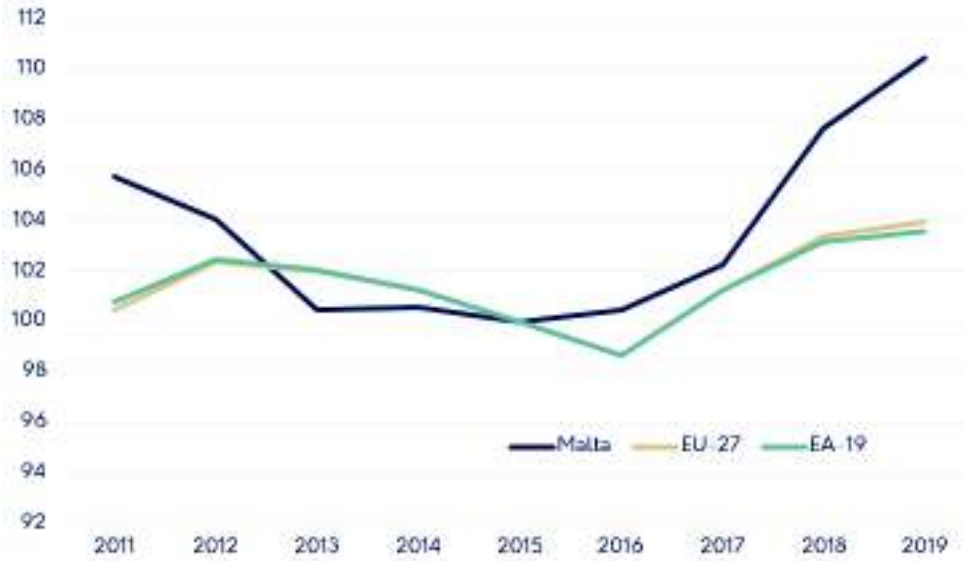
A cursory glance at [chart 1.47](#) shows that merchandise exports from Malta has gradually declined in recent years, falling by around 15.5% between 2012 and 2019, which further underscores Malta's competitiveness challenge within manufacturing. This requires significant investment in innovative technologies and a concerted effort towards greater industry-wide digitization. Despite the growing levels of domestic and foreign investment within the sector, research and development in manufacturing continues to be extremely low, as seen in [chart 1.48](#), where business expenditure on research and development has fallen in recent years despite the elevated levels of economic growth recorded. Therefore, a more concerted effort at encouraging research and development within this sector is required in order to close the competitiveness gap and ensure the survival and growth of the Maltese manufacturing sector.

**Chart 1.45 Labour cost index – Manufacturing**



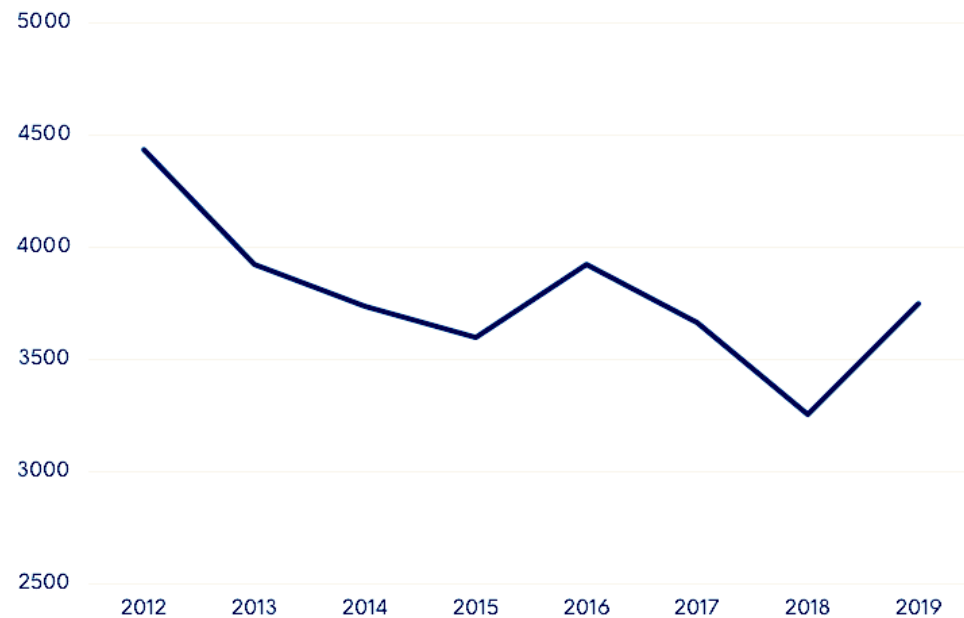
Source: Eurostat, 2020

**Chart 1.46 Output price index – Manufacturing**



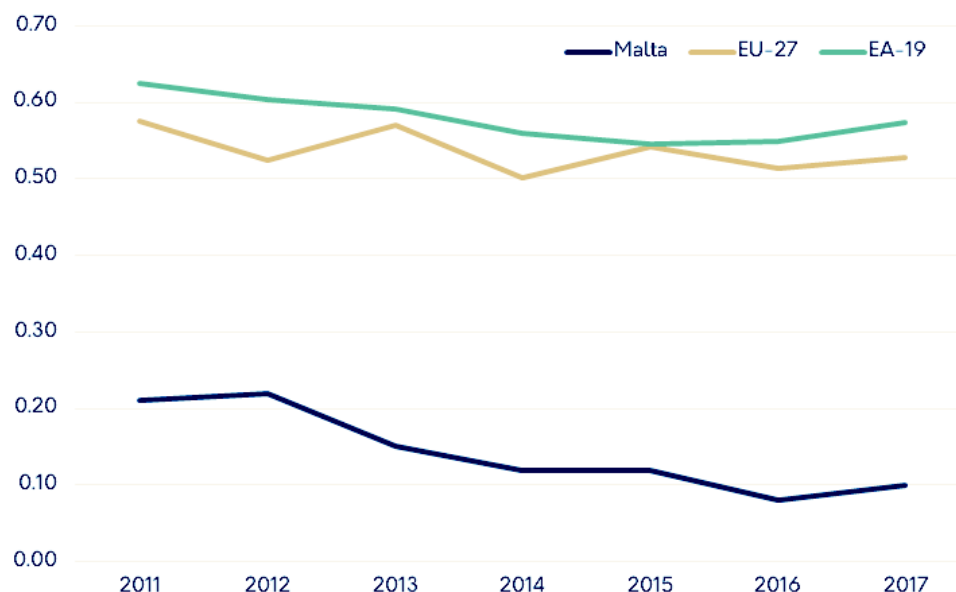
Source: Eurostat, 2020

**Chart 1.47 Exports of goods**



Source: Eurostat, 2020

**Chart 1.48 Business R&D spending – Manufacturing (% of GDP)**



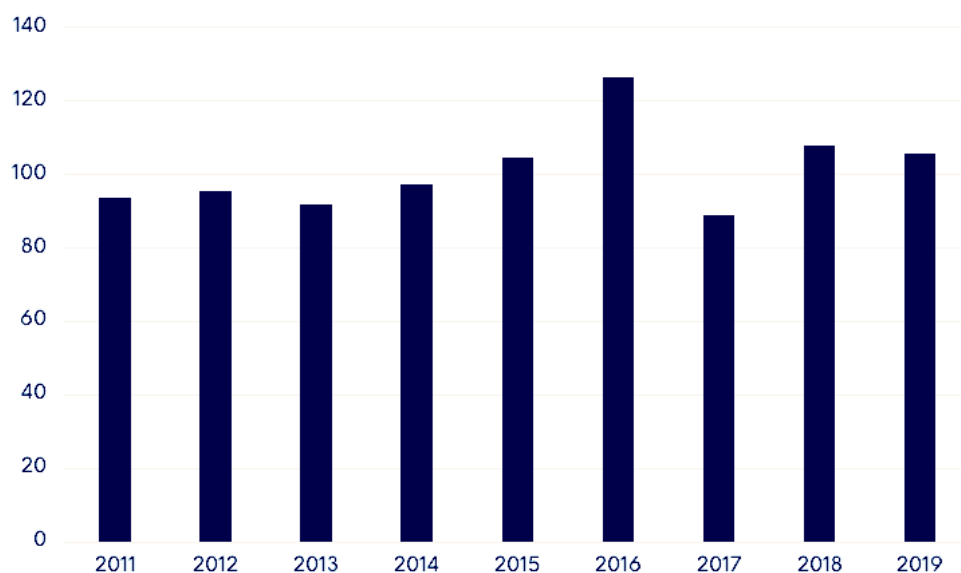
Source: Eurostat, 2020

### 1.2.7 Agriculture and Fisheries

The agriculture and fisheries sector has stagnated somewhat in recent years, as evidenced by the Gross Value Added (GVA) (See chart 1.49). Over the period 2011 to 2019 the sector's GVA grew by a modest 12.8%, despite the general economic upturn and increased demand for food products by locals, foreign residents and tourists alike. Crop and animal production, hunting and related services and forestry decreased by 1.4% over this time period, while fisheries and aquaculture grew by over 72.0% on the back of strong demand for fish and other sea-based food. In fact, as shown in chart 1.50, aquaculture production in Malta has increased significantly in recent years, growing by over 373.0% between 2011 and 2018. As a result, the composition of the sector has changed somewhat over the years, with fisheries now accounting for 29.4% of the sector's total GVA, compared to 19.3% in 2011, which reflects the growth of the fisheries sector (and in particular aquaculture) coupled with the general stagnation of other agricultural sectors like crop and animal production. As expected, overall the relative importance of agriculture and fisheries to the Maltese economy has continued to diminish, now accounting for only 0.9% of Malta's total GVA in 2019, down from 1.6% in 2011 (NSO, 2020).

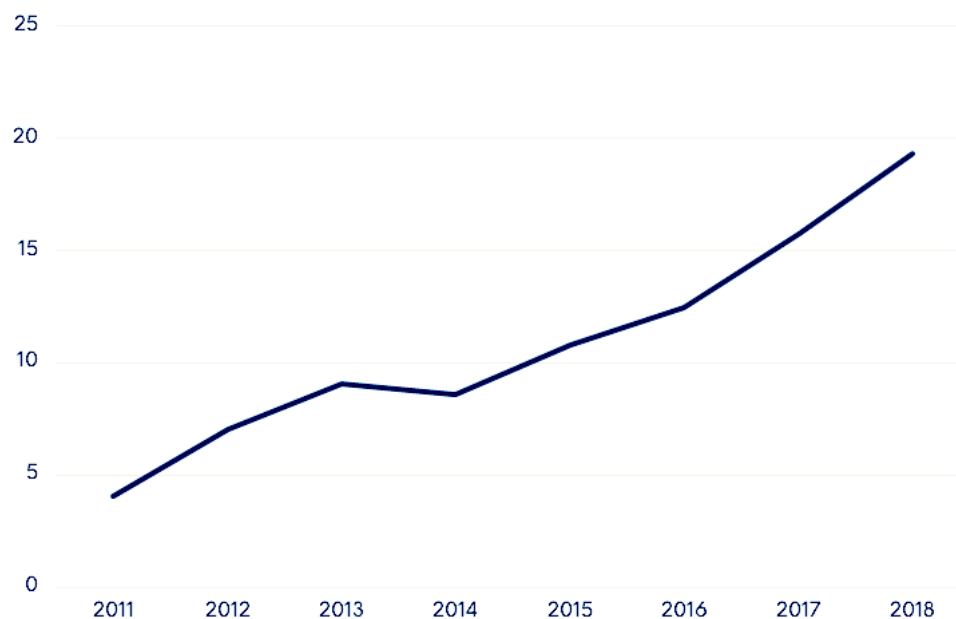
Employment within the sector has also been relatively flat, growing by 11.0% over 2011-2019, with a dip in 2013-2015 offset by sustained growth thereafter (See chart 1.51). Once again, the general patterns mimic those observed for GVA, with employment within crop, animal production and other related activities increasing by only 4.0% over this period, while employment growth in fisheries reached approximately 20.0% over 2011-2019. In total, the sector accounts for 1.4% of the gainfully occupied population in Malta, down from 1.9% in 2011.

**Chart 1.49 Gross value added – agriculture & fisheries (euro millions)**



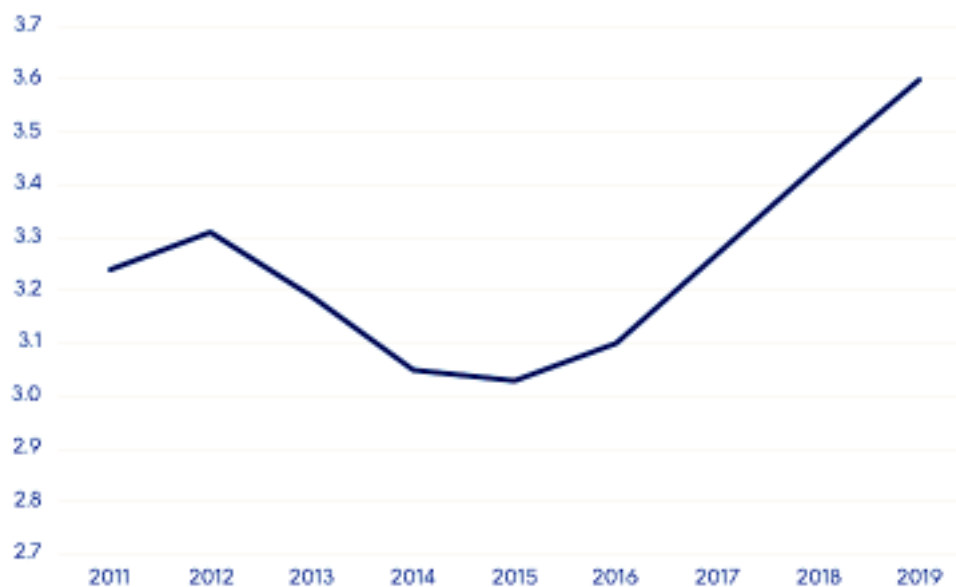
Source: Eurostat, 2020

**Chart 1.50 Production and aquaculture (thousand tonnes)**



Source: Eurostat, 2020

**Chart 1.51 Gainfully-occupied population – Agriculture & fisheries (thousand)**



Source: Eurostat, 2020

The impact of COVID-19 on the agricultural and fisheries sector has been significant, with any gains from domestic demand for local produce outweighed by reduced



demand from hotels and restaurants due to lockdown and the closure of Malta's tourism market, coupled with sluggish external demand for Maltese agricultural exports like potatoes. In the first quarter of 2020, GVA from agriculture and fisheries declined by around 5.0% relative to the same quarter in 2019, and this is expected to be much higher in subsequent months as the onset of the pandemic kicked in. Thus, even though the pandemic has brought renewed focus on the strategic importance of the domestic agricultural and fisheries sector for food security in the face of such crises, the sector faces a number of challenges on its road to recovery and longer-term prosperity.

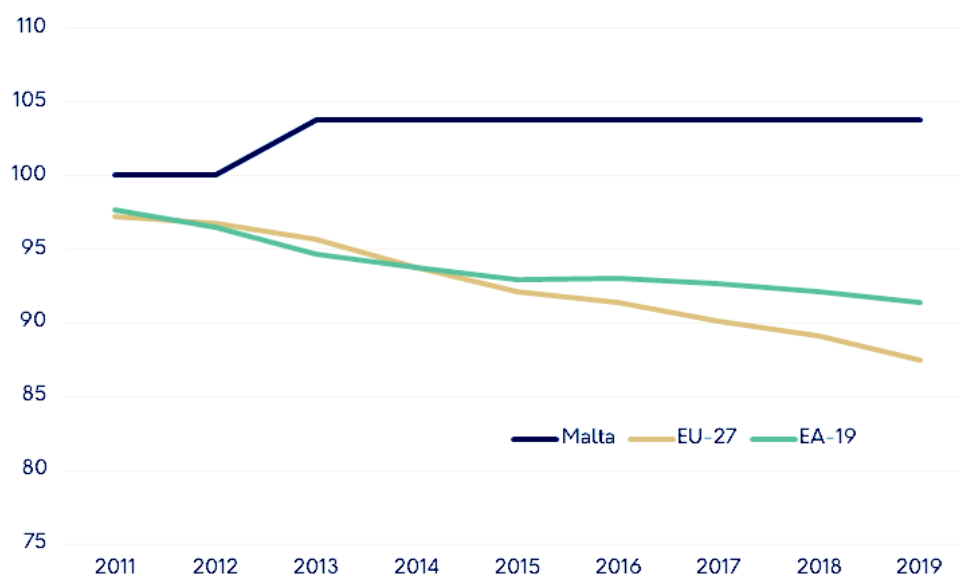
Over the years, Malta has witnessed significant consolidation within the agricultural sector, with [table 1.2](#) showing how the number of farms across all four livestock categories has fallen significantly over the period under review, as has the number of heads for each product. This is part of a concerted effort to improve the operating efficiency of domestic farms, with the Rural Development Programme focusing specifically at modernizing agricultural holdings and promoting innovation and investment in the necessary tools and knowledge. The need for such investment is particularly evident since, as seen in [chart 1.52](#), the Maltese agricultural sector is significantly more labour-intensive than its European counterparts, with the Agricultural Labour Input Index flat lining in recent years despite the drop in livestock farms and heads. Therefore, it is imperative that domestic farmers are supported through a number of investment aid measures and funding opportunities targeted specifically at new technologies that will assist in reducing the operating costs of domestic agricultural operators. Apart from this, other medium-term challenges are mainly focused around environmental sustainability. Groundwater abstraction is a perennial concern given the state of Malta's groundwater resources, although recent efforts at providing New Water to farmers for irrigation by Water Services Corporation should assist in alleviating such pressures. In addition, a key priority is to bring existing animal slurry disposal practices in line with the EU's Waste Framework Directive, together with continuous monitoring of nitrates in Maltese soil as per the Nitrates Directive, all of which may entail significant changes to existing farming practices.

**Table 1.2 Livestock Farms and Heads in Malta**

	<b>Pigs</b>		<b>Cattle</b>		<b>Goats</b>		<b>Sheep</b>	
	<i>Heads</i>	<i>Farms</i>	<i>Heads</i>	<i>Farms</i>	<i>Heads</i>	<i>Farms</i>	<i>Heads</i>	<i>Farms</i>
2011	46,287	116	15,074	322	4,938	846	11,887	1,374
2012	45,209	111	15,593	308	4,847	839	11,697	1,392
2013	49,451	105	15,220	290	4,598	819	10,930	1,384
2014	47,465	100	14,883	281	4,627	803	10,526	1,341
2015	43,634	99	15,020	266	4,937	826	11,076	1,327
2016	40,597	95	14,356	257	4,971	782	11,523	1,279
2017	34,011	94	14,184	251	5,160	757	11,736	1,257
2018	36,294	97	14,125	252	5,726	763	13,169	1,240
2019	35,477	93	13,995	248	5,593	758	13,161	1,231

Source: NSO, 2020

**Chart 1.52 Agricultural labour input index**

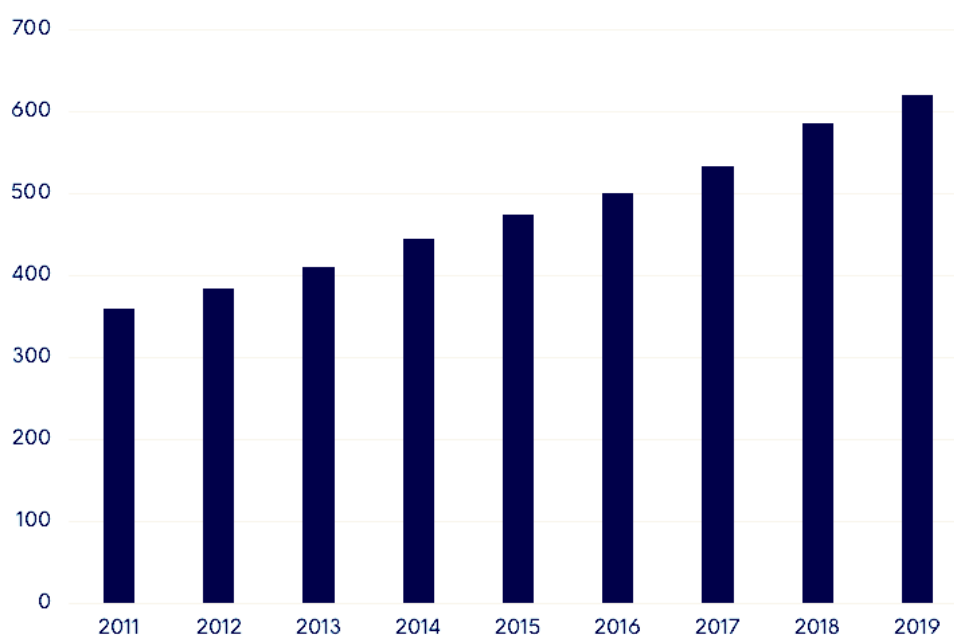


Source: Eurostat, 2020

### 1.2.8 Education

Education is a burgeoning economic sector in Malta, largely due to the presence of several English Language Training (ELT) schools for foreign students, although recent years have also seen the emergence of new tertiary education institutes setting up their operations domestically, typically affiliated with reputable foreign universities. As seen below in [chart 1.53](#), the educational sector has grown steadily in recent years, recording growth of 72.0% over the period 2011 to 2019. During this period the ELT sector fluctuated somewhat, growing significantly up to 2017, with annual growth of 13.6% in student arrivals between 2016 and 2017 (NSO, 2018), with a slight dip thereafter as student numbers subsided, reaching 83,610 in 2019 (down from 87,112 in 2018).

**Chart 1.53 Gross value added – Education (Euro millions)**

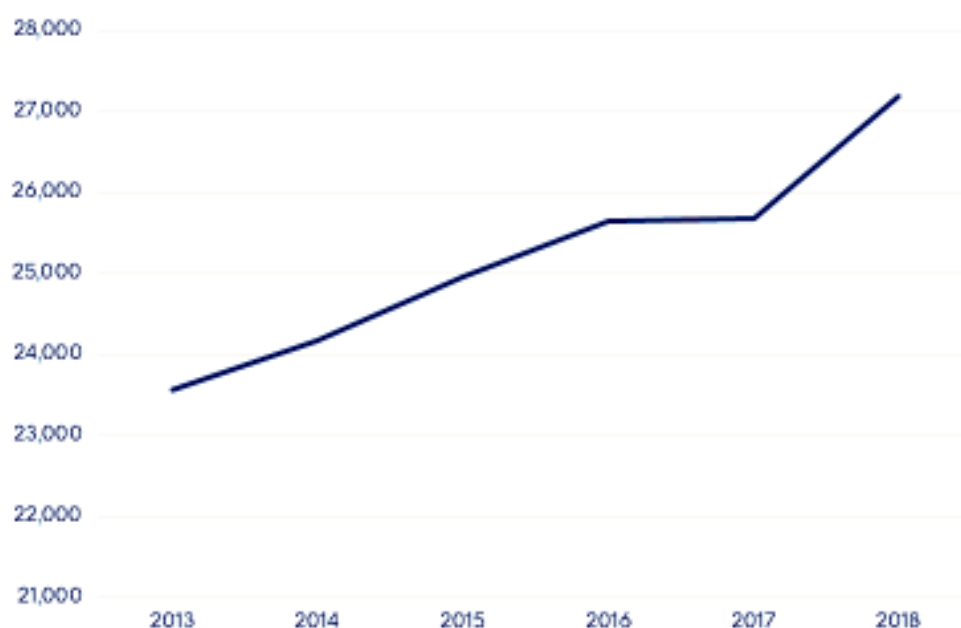


*Source: Eurostat, 2020*

At the same time, the number of students enrolled at private educational institutions at all ISCED levels in Malta has increased substantially over the period under review, as shown in [chart 1.54](#), growing by 15.3% between 2013 and 2018, relative to the overall increase in student enrolments of 4.9% over this same period. In fact, students enrolled at private institutions accounted for 33.0% of total enrolments in 2018, compared to

30.0% in 2013, which further attests to the growth in private education in Malta. This is further analysed in [table 1.3](#), which shows that private educational enrolment in Malta has increased across all ISCED levels, with particularly strong levels of growth recorded in post-secondary and tertiary institutions. Overall, the educational sector now accounts for 5.3% of Malta's total GVA, down slightly from 6.0% recorded in 2011. Employment within the educational sector has grown by almost 27.0% between 2011 and 2019, reflecting the sector's overall growth over this time period. Education now accounts for 7.7% of Malta's gainfully occupied population, down from 9.0% in 2011 ([See chart 1.55](#)).

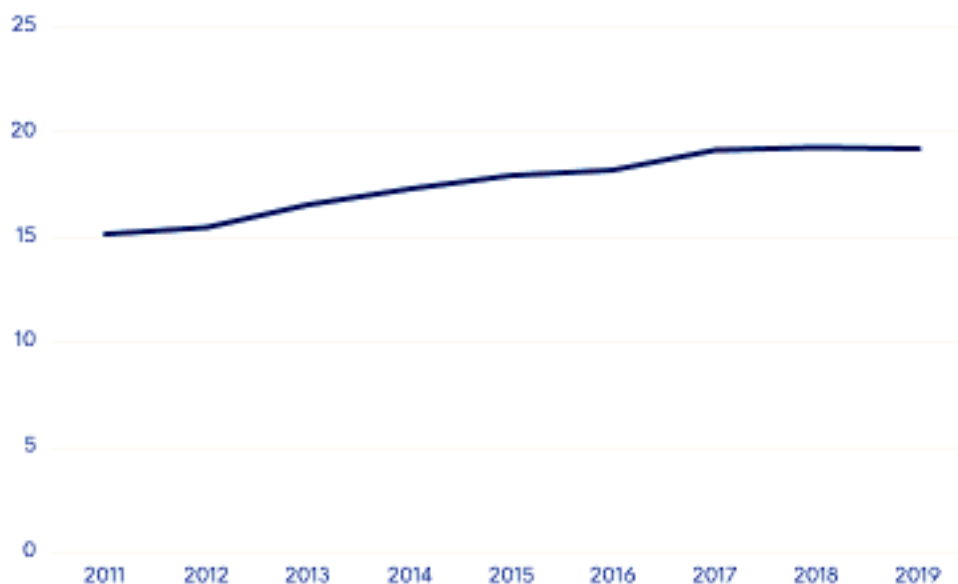
**Chart 1.54 Student enrolment at private educational institutions**



*Source: Eurostat, 2020*

**Table 1.3 Private education enrolment in Malta**

<b>ISCED11 Level</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
Primary education	10,077	10,503	10,883	11,012	11,290	11,379
Lower secondary education	5,804	5,913	5,907	5,911	5,933	5,906
Upper secondary education	5,003	5,122	5,056	5,159	4,952	5,168
Post-secondary non-tertiary education	0	0	92	41	22	151
Short-cycle tertiary education	0	0	21	207	114	652
Bachelor's or equivalent level	94	121	158	266	278	420
Master's or equivalent level	8	36	145	320	508	808
Doctoral or equivalent level	0	0	0	0	0	0

**Chart 1.55 Gainfully-occupied population – Education (thousand)**

Source: Eurostat, 2020

The education sector has been impacted by the COVID-19 crisis in a number of ways. In the wake of the pandemic and the various containment measures introduced by the government, educational institutions across all ISCED11 levels turned to online teaching and other digital technologies in order to ensure continuity, with these practices likely to persist at least partially in the near future. The ELT segment has been hit particularly hard by the crisis, with the closure of Malta's airport effectively decimating demand for such services, and short-term prospects continue to be bleak as uncertainty and fears surrounding overseas travel persist. In fact, the Federation of English Language Teaching Organisations Malta (FELTOM) reported that student arrivals are only at 9.0-10.0% of 2019 levels, with closures and redundancies likely if the situation persists. When it comes to private tertiary education institutions, short-term prospects largely depend on student appetite for online courses and programmes of study, and the institutions' ability to adapt to the new realities of online teaching, which may have an impact on profitability. The common thread for all of these educational institutions is the need to invest in digital technologies in order to stave off any severe drops in revenue over the coming months, and in turn tap into new markets and potential students, which would contribute to longer-term growth and development of the sector.

### **1.2.9 Professional Services**

Professional services encompass a wide array of key business support functions, including legal and accounting services, management consultancy, architecture and engineering activities, advertising, and other scientific, technical and research services. As seen from [chart 1.56](#), professional services have grown significantly in recent years, with growth of over 178.0% recorded between 2011 and 2019. This is unsurprising considering the elevated levels of growth recorded in other sectors like construction, financial services and iGaming, given that this sector provides a multitude of ancillary and support services for these other sectors. [Chart 1.57](#) provides a breakdown of the contribution of each individual segment to the professional services sector's overall GVA. Over the period under review the highest growth was recorded in other professional, scientific and technical activities; veterinary activities; advertising and research (372.0%), followed by architectural and engineering activities; technical testing and analysis (147.0%) and legal and accounting activities; activities of head

offices; management consultancy activities (142.0%). The sector now accounts for around 8.2% of Malta's GVA, up from 5.8% in 2011.

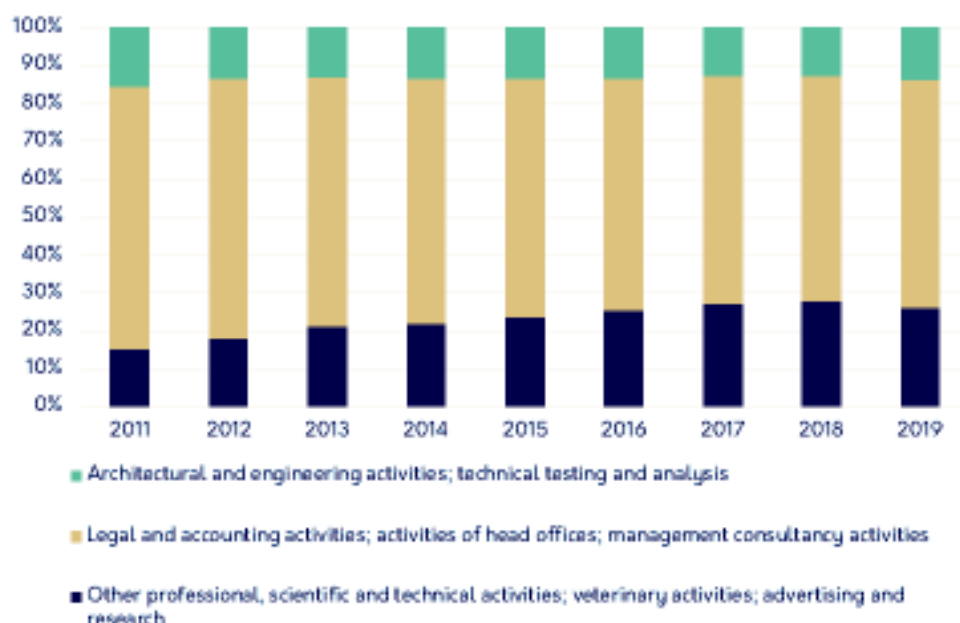
When it comes to employment, as seen in [chart 1.58](#) the gainfully occupied population within the professional services sector has grown by around 116.0% over the period 2011-2019, reflecting the aforementioned growth within the sector. Once again, the strongest growth in employment was recorded within other professional, scientific and technical activities; veterinary activities; advertising and research (184.0%), followed by legal and accounting activities; activities of head offices; management consultancy activities (109.0%) and architectural and engineering activities; technical testing and analysis (87.0%). In total, this sector now accounts for 6.8% of Malta's gainfully occupied population, up from 4.8% in 2011.

**Chart 1.56 Gross value added – Professional services (euro millions)**



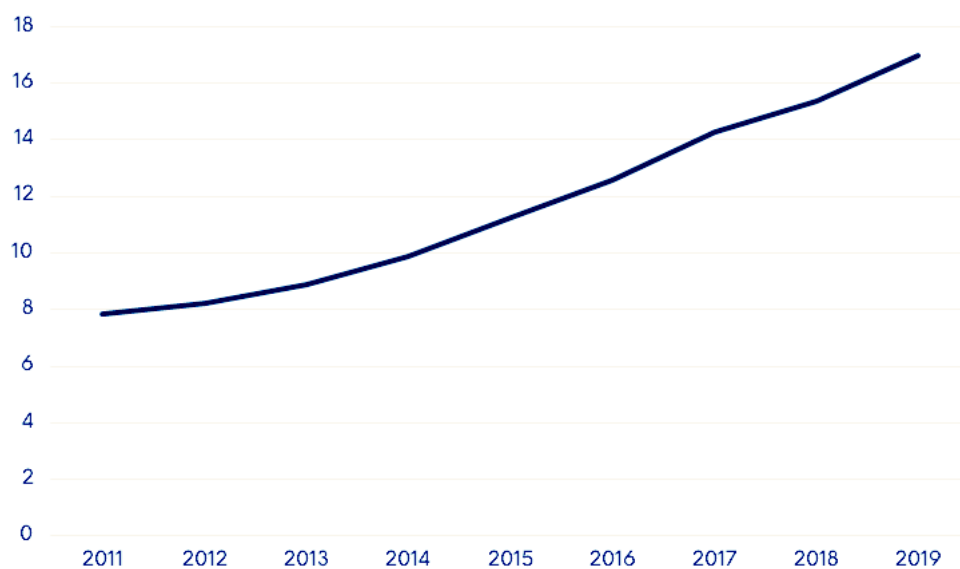
Source: Eurostat, 2020

**Chart 1.57 Professional service by type**



Source: Eurostat, 2020

**Chart 1.58 Gainfully-occupied population – Professional services (thousand)**



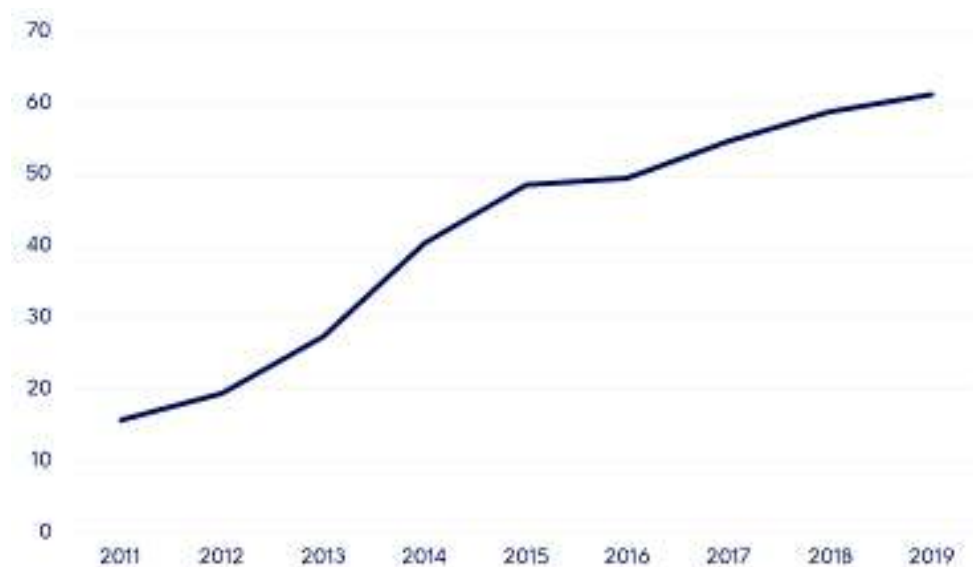
Source: Eurostat, 2020



As with the rest of the economy, the professional services sector has felt the ramifications of the economic crisis precipitated by the COVID-19 pandemic, mainly due to the slowdown in other key industries. Indeed, the Services Confidence Indicator entered negative territory at -56.8 in April 2020; by June this had worsened to -57.3, reflecting the negative short-term outlook for services as a whole, although expectations regarding future demand picked up somewhat from -54.1 in April to -16.3 in June 2020 (EC, 2020). When it comes specifically to professional services, the data indicates that in Q1 2020 total turnover dipped marginally by 0.5% relative to the same period in 2019 (Eurostat, 2020), showing that at least initially the impact of the pandemic on the sector was minimal, although data for subsequent periods may provide a better reflection of the true scope of the impact. A key strength of this sector within the context of the crisis was its ability to adapt to the new realities and adopt effective remote working practices, facilitated by the nature of the work itself.

In recent years the sector has experienced significant growth in investment, as seen in [chart 1.59](#), where we observe that gross fixed capital formation grew by 286% between 2011 and 2019, mainly fuelled by growth in intellectual products (+311.0%) and ICT equipment (+123.5%). Such investment is vital for the sector to further develop its resilience to these types of exogenous shocks, while also allowing for greater flexibility in work and reduced overheads. In the medium-to-long term, the sector's prosperity is inexorably linked to the fortunes of the rest of the economy, as well as the availability of high-skilled human capital. This latter point is of particular relevance in the current scenario given that as at December 2019 the sector employed the largest number of foreign nationals in Malta, with almost 8,000 EU-nationals and 8,846 third-country nationals (JobsPlus, 2020). In the wake of the pandemic several foreign nationals left Malta to return to their home countries – by April 2020 at least 4,700 had been repatriated, with several others following suite (Ministry for Foreign Affairs, 2020), and it remains to be seen whether these workers will return to Malta once the pandemic subsides, thus potentially exacerbating the shortage of labour within the professional services sector.

**Chart 1.59 Gross fixed capital formation – Professional services (euro millions)**



Source: Eurostat, 2020

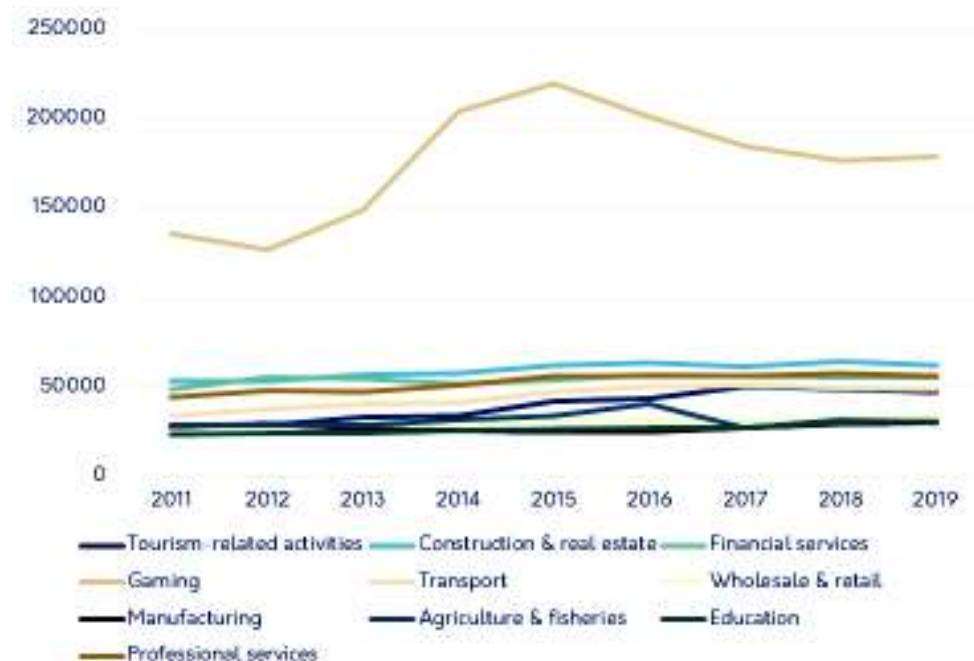
### **1.2.10 Sectoral productivity**

This section provides a detailed comparison of the economic characteristics of the key sectors in the Maltese economy, with a specific focus on productivity performance as it relates to competitiveness and overall resilience to economic shocks like the COVID-19 pandemic.

Based on an aggregate productivity level €47,701 for the entire Maltese economy in 2019, [Table 1.4](#) classifies each sector according to whether its productivity lies below (low) or above (high) this threshold, whereby productivity is defined as nominal GVA per worker in each sector. As seen below, one sector dominates the rest, namely the gaming industry, where each worker generates €176,358 of GVA per year as at 2019. In a distant second is construction and real estate (€62,717 per worker) followed by professional financial services (€57,020). At the bottom of the list is the agriculture and fisheries sector with a GVA per worker of €29,319, followed by manufacturing (€31,370) and education (€32,305). As shown in the table, it is evident that when it comes to productivity there is considerable dispersion across the different sectors, reflecting different levels of technological investment and skills within each sector, coupled with the inevitable labour-intensity of certain sectors like education and

tourism. Nonetheless, growth in productivity has been recorded across each of the sectors over the period 2011 to 2019, with tourism leading the way at 69.0%, followed by transport (42.0%) and education (36.0%). Transport warrants particular mention, since this sector would have been classified as low-productivity in 2011 but has grown sufficiently to be considered as high-productivity by 2019. Thus, it is clear that a number of sectors have been catching up in terms of their productivity levels, notably tourism which is on the borderline, although it bears mentioning that the lowest-performing sectors in terms of productivity growth over this period were agriculture and fisheries (+1.5%) and manufacturing (+10.2%), the two lowest-productivity sectors. Hence, more needs to be done in terms of understanding the key productivity challenges that exist within these sectors, as well as a carefully targeted strategy aimed at attracting new investment in physical, human and digital capital within these laggard sectors.

**Chart 1.60 Sectoral productivity (euro)**



Source: Eurostat, 2020

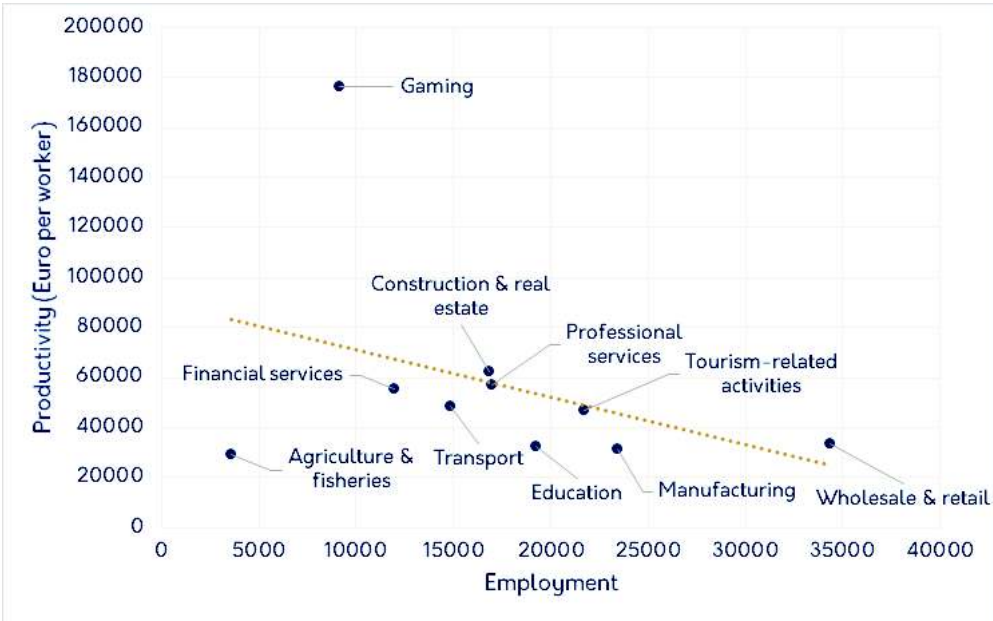
**Table 1.4 Sectoral labour productivity in Malta, 2019 (Nominal GVA per worker)**

<b>High Productivity Sectors</b>	<b>Euro/worker</b>
<b>Gaming</b>	176,358
<b>Construction and real estate</b>	62,717
<b>Professional services</b>	57,020
<b>Financial services</b>	55,765
<b>Transport</b>	48,608
 <b>Low Productivity Sectors</b>	
<b>Tourism-related activities</b>	46,976
<b>Wholesale and retail</b>	33,678
<b>Education</b>	32,305
<b>Manufacturing</b>	31,370
<b>Agriculture and fisheries</b>	29,319

*Source: Eurostat, 2020*

We now take a deeper look at sectoral productivity by analysing variations based on the size of the workforce. This relationship is depicted in [chart 1.61](#) for the year 2019, with grouping each sector according to whether they are high or low employment (based on a sectoral average of 17,203 workers as the cut-off point) and productivity. As shown below, there is a weakly-negative correlation between size of workforce and productivity, with leaner sectors like gaming and financial services having higher levels of productivity relative to larger sectors like education and manufacturing, although it is important to reiterate this relationship is not particularly strong. Nonetheless, what the diagram does suggest is that certain labour-intensive sectors with large workforces have struggled to generate higher levels of value-added, which tallies with the previous discussion on the need for further digitization in sectors like wholesale and retail as well as investment in innovative technologies in manufacturing. On the other hand, sectors like construction and real estate, gaming, financial services and professional services have successfully managed to generate significant value-added from a comparatively smaller workforce, reflecting the booming nature of economic activity within these sectors.

Chart 1.61 Employment versus productivity – 2019



Source: Eurostat, 2020

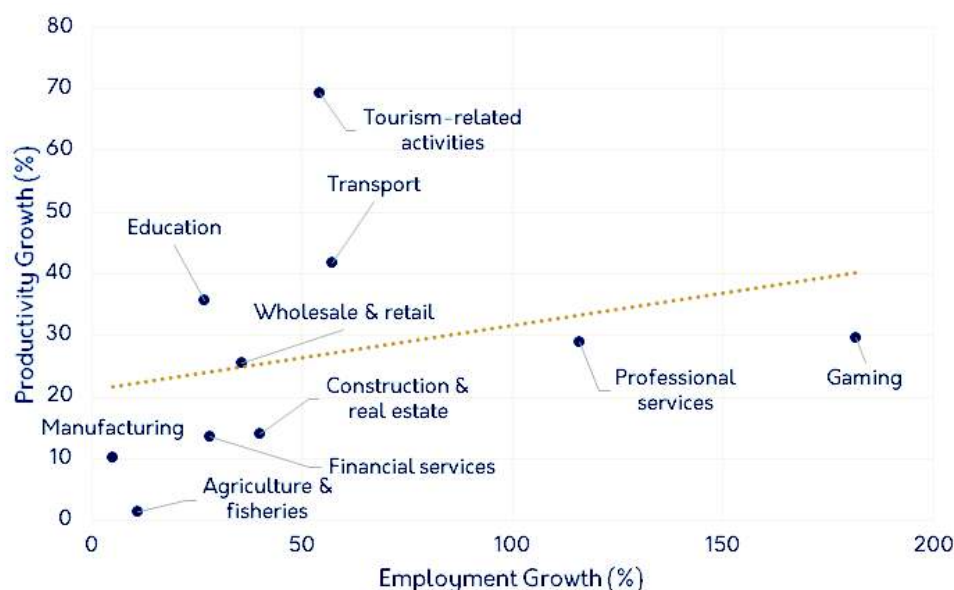
Diagram 1.1 Employment versus productivity

		Productivity	
		Low	High
Employment	High	Tourism-related activities, Wholesale & retail, Manufacturing, Education	
	Low	Agriculture & fisheries	Construction & real estate, Financial services, Gaming, Transport, Professional services

At this point, it is also worth considering the relationship between employment growth and productivity growth, in order to assess whether those sectors experiencing higher

levels of productivity growth have also led to greater job creation. This is shown in [chart 1.62](#), further classifying sectors according to whether they are high or low productivity and employment growth sectors for the period 2011 to 2019, based on national averages for both indicators.

**Chart 1.62 Employment growth versus productivity growth – 2011 – 2019**



Source: Eurostat, 2020

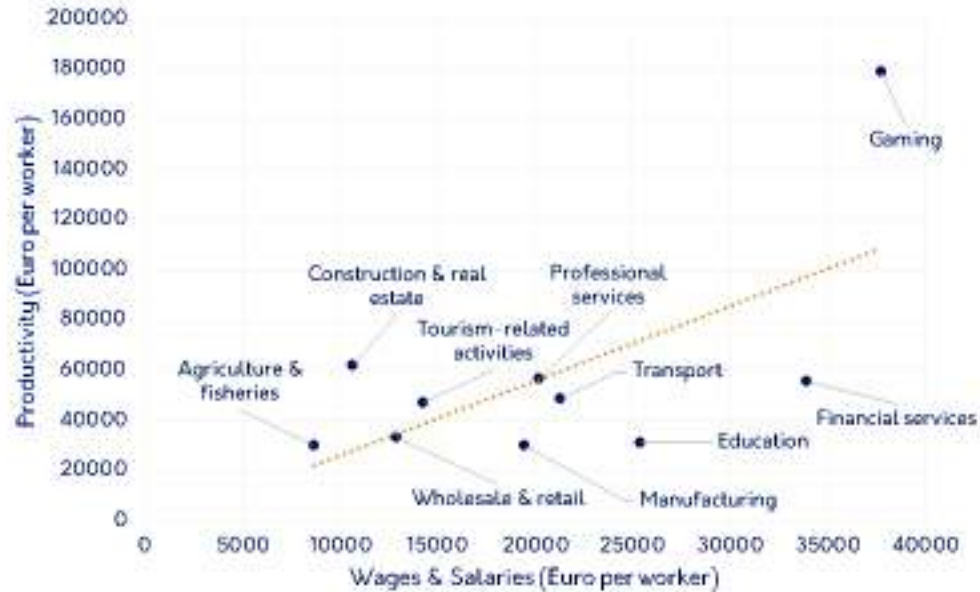
This time we observe a weakly-positive correlation between employment and productivity growth, with the findings suggesting that low productivity growth and low employment growth went hand-in-hand over the period under review. Several sectors experienced both low job creation and productivity growth, indicating that such sectors focused on consolidating existing operations, particularly in sectors like financial services and construction & real estate, where GVA growth was still high. Other sectors like gaming and professional services experienced low levels of productivity growth despite high levels of job creation, which in part reflects the fact that productivity in these sectors was already significantly high (as seen previously).

**Diagram 1.2 Employment growth versus productivity growth**

		Productivity Growth	
		Low	High
Employment Growth	High	Gaming, Professional services	Tourism-related activities, Transport
	Low	Agriculture & Fisheries, Construction & real estate, Financial services, Wholesale & retail, Manufacturing	Education

An important question is related to the wages and salaries earned by workers in each sector, and whether these move in line with productivity. [Chart 1.63](#) plots sectoral productivity against average annual wages and salaries per worker within each sector, while [diagram 1.1](#) classifies sectors according to whether they have high or low productivity and wages and salaries compared to the national averages (EUR 19,930 for average wages and salaries in Malta in 2019). In this case, we observe a clear positive correlation between wages and productivity, with the highest wages unsurprisingly concentrated in the highest productivity sectors like gaming, financial services and professional services, with low-productivity sectors like manufacturing and agriculture and fisheries by contrast having low wages. The education sector is worth highlighting, given that the sector has higher-than-average wages despite recording lower-than-average productivity, which may act as a significant obstacle to the sector's competitiveness and profitability, particularly in the pandemic survival and recovery period. On the other hand, construction and real estate are characterized by high productivity and low wages, which to some extent reflects the prevalence of low-skilled, low-paying jobs within these sectors, which nonetheless have still managed to generate high levels of value-added.

**Chart 1.63 Productivity versus wages and salaries**



Source: Eurostat, 2020

**Diagram 1.3 Productivity versus wages and salaries**

		Productivity	
		Low	High
Wages & Salaries	High	Education	Financial services, Gaming, Transport, Professional services
	Low	Tourism-related activities, Agriculture & Fisheries, Manufacturing, Wholesale & retail	Construction & real estate

Finally, we consider the returns to labour income (RLI) for each sector, defined as the value added generated by each worker for every Euro spent on wages and salaries. This ratio provides a more succinct indicator of the value extracted from the labour



force within each sector, and thus point towards potential sectoral competitiveness. The results are shown in [Table 1.5](#) for the year 2019, whereby each sector is classified as having either high or low RLI using Malta's aggregate RLI for 2019 of around €2.37.

As seen below, the construction and real estate sector has the highest RLI in Malta with €5.87 generated per Euro of wages and salaries, followed by gaming (€4.67) and agriculture and fisheries (€3.38). The classification of some sectors as being high RLI in part reflects the comparatively low wages on offer, namely when it comes to agriculture and fisheries and wholesale and retail, while for gaming and professional services the high levels of productivity more than offset the relatively high wages on offer. For construction and tourism, the combination of low wages and growing productivity has resulted in their current classification, which bodes well for competitiveness. On the other end of the scale, the lowest RLI sectors in Malta are education (€1.27), manufacturing (€1.61) and financial services (€1.64).

**Table 1.5 Returns to labour income**

<b>High Returns to Labour Income (RLI) Sectors</b>	<b>GVA per Euro of Wages &amp; Salaries, 2019 (EURO)</b>
<b>Construction and real estate</b>	5.87
<b>Gaming</b>	4.67
<b>Agriculture and fisheries</b>	3.38
<b>Tourism-related activities</b>	3.30
<b>Professional services</b>	2.82
<b>Wholesale and retail</b>	2.61
<b>Low Returns to Labour Income (RLI) Sectors</b>	
<b>Transport</b>	2.28
<b>Financial services</b>	1.64
<b>Manufacturing</b>	1.61
<b>Education</b>	1.27

The presence of financial services is perhaps somewhat surprising, possibly reflecting higher expenditure on wages for compliance and audit jobs within the sector due to the introduction of new EU-wide directives in recent years, like Solvency II, the second Payment Services Directive (PSD2) and the Insurance Distribution Directive (IDD). The

education sector's low RLI reflects the high wages paid within the sector relative to productivity levels, which may prove to be problematic within the current economic climate as demand for ELT and other private education falls. Similar arguments can also be made in relation to the manufacturing sector, even though it has both low wages and low productivity. Finally, despite recent productivity gains, the transport sector still has a relatively low RLI, although this has increased by 27.0% since 2011.

## Appendix 1.1 Policy considerations

Tourism-related activities		
<b>Challenges</b> Seasonality  Rise of private rented accommodation  Increased reliance on foreign workers, especially third-country nationals Environmental pressures including climate change	<b>Opportunities</b> Record growth in tourist numbers, all year round  New niches like events and festivals, medical tourism Ongoing investment to boost occupancy capacity  High levels of productivity & comparatively low wages	<b>Potential Targets</b> Market off-peak tourism, including culture, hiking, diving, etc. Generate awareness among tourism operators regarding sustainability Develop a holistic climate change adaptation strategy for the tourism industry Regulate and enforce standards for private rented accommodation Integrate digital technologies in the tourism product offering
<b>COVID-19 Impact</b> Closure of airport brought the industry to a complete standstill in Q2 2020. Re-opening in June 2020 ameliorated matters, but business is still lagging, with mass unemployment only prevented by government wage assistance schemes Focus is on internal tourism, aided by government voucher scheme Short-term recovery prospects are bleak, especially as infection rates pick up & mass events are cancelled. Prospect of a second wave would hamper recovery further Many foreign workers have left the country, which may result in upward wage pressures as business recovers		

Construction and real estate		
<b>Challenges</b> Public perception of industry	<b>Opportunities</b> Low interest rates	<b>Potential Targets</b> Create industry-wide KPIs for sustainable

Health and safety concerns, and prospect of significant reform in this regard	Emergence of the buy-to-rent market	construction and demolition Promote the circular economy as a tool for reducing reliance on raw materials and thus lower costs Publicly-available blacklist of any contractors with health and safety infringements
Rising raw material costs	Strong domestic home-ownership	
Waste management issues, including circular economy requirements and adequate disposal sites	Higher demand from foreign workers and expats	
<b>COVID-19 Impact</b> Impact on construction activity limited due to continuance of works even during lockdown, though rate of activity slowed down Slowdown in economic activity and job losses will inevitably lead to lower demand for housing, and thus resulting in lower house prices Downturn partially mitigated by government support schemes aimed at lowering stamp duty and income tax on property sales, although uncertainty regarding recovery and second wave will likely dampen the market		

Financial services		
<b>Challenges</b> Uncertainty regarding outcome of Moneyval report and potential grey-listing Increased regulatory oversight and compliance Lack of human resources to fill key technical positions Putative EU-wide tax on financial services Relatively low levels of value-added generated from every Euro spent on wages and salaries	<b>Opportunities</b> High levels of productivity Diverse, mature sector with significant FDI Emergence of new niches like Protected Cell Companies and captives within the insurance sector	<b>Potential Targets</b> Improved regulatory and enforcement resources for financial authorities Encourage greater investment in FinTech and InsurTech Raise awareness regarding the opportunities within finance for non-finance graduates from ICT, Mathematics, Statistics, etc.

### COVID-19 Impact

Initial impact of pandemic was limited, with business continuity ensured via swift teleworking arrangements facilitated by investment in digital technologies  
For banks, short-to-medium term impact depends on ability of highly-exposed clients to meet their debt obligations, and thus liquidity  
Increased volatility in financial markets will impact several financial service providers within trading, pensions, portfolio management, etc.  
Insurance operators may be hit by potential losses from investment returns

### Gaming

#### Challenges

Shortage of human capital in technical fields  
  
Increased regulatory oversight and compliance  
  
Moneyval report may have significant impact on payment processing

#### Opportunities

High levels of productivity and returns from labour income  
Vibrant sector with significant technological investment and intellectual property  
New, more sophisticated products facilitated through AI and Big Data  
  
Labour force flexibility via teleworking

#### Potential Targets

Promotion of responsible gaming among consumers  
Greater oversight of gaming companies in terms of AML  
  
Raise awareness regarding the opportunities within gaming across several disciplines like Economics, Finance, Statistics, etc.

### COVID-19 Impact

Teleworking assisted in softening the blow, ensuring a smooth transition and business continuity  
Weak demand, mainly due to lower incomes as well as the postponement of major sporting events and tournaments  
Bleak economic outlook likely to lead to postponement of investment until conditions improve  
Labour shortages likely to be exacerbated by the number of foreign workers who have left Malta in the wake of the pandemic

### Transport

#### Challenges

EU Mobility Package will lead to higher freight costs

#### Opportunities

Online shopping and ecommerce have boosted courier services and freight transportation

#### Potential Targets

Greater focus on environmental sustainability & development of long-term

<p>Emissions limits are getting progressively stricter</p> <p>Proposed taxes (e.g. EU carbon tax, shipping tax) would lead to further cost increases</p> <p>Ongoing debate regarding electrification and banning of fossil fuel vehicles</p> <p>Significant increase in wages &amp; salaries in recent years</p>	<p>International trade and openness are key economic pillars for Malta</p> <p>Use of advanced technologies to improve logistics and efficiency of transportation</p> <p>High levels of labour productivity</p>	<p>industry strategies in this regard</p> <p>Invest in new digital tools to drive efficiency gains</p> <p>Ensure that port infrastructure in Malta facilitates lean shipping operations</p>
<p><b>COVID-19 Impact</b></p> <p>Significant impact due to reduced air and sea travel</p> <p>Shipping and freight transportation assumed even greater importance to ensure the provision of essential supplies</p> <p>Weak economic conditions likely to dampen demand for freight transportation</p> <p>Several airlines (including Air Malta) are experiencing huge difficulties, with mass layoffs and redundancies.</p>		

Wholesale and retail		
<p><b>Challenges</b></p> <p>Strong competition from e-commerce websites and other sellers abroad</p> <p>Weak domestic e-commerce sales and low utilization rates</p> <p>High dependency on foreign workers</p> <p>Rising rent costs for floor space</p> <p>Low levels of productivity</p>	<p><b>Opportunities</b></p> <p>Emergence of low-cost, direct marketing channels for customer engagement like social media</p> <p>Population growth in Malta above the EU average, fuelled by increase in foreign workers, as well as record tourist arrivals</p>	<p><b>Potential Targets</b></p> <p>Improved use of existing e-commerce facilities to drive sales</p> <p>Invest in new digital technologies to improve back-end operations and efficiency and target new markets</p>
<p><b>COVID-19 Impact</b></p> <p>Temporary closure of retail outlets had significant impact on sales</p> <p>Continued economic uncertainty likely to dampen demand in the short-term, with both business and consumer confidence low</p>		

Some operators pivoted rapidly towards online sales; others lagged behind due to lack of online infrastructure  
Wage supplement and voucher scheme by the government intended to soften the blow of the crisis

Manufacturing		
<b>Challenges</b> Low productivity levels       Modest growth over the period 2011-2019, despite booming economic conditions High labour costs relative to EU-27 and EA-19  Output price index significantly above EU average, undermining competitiveness Merchandise exports have fallen in recent years Low R&D expenditure	<b>Opportunities</b> Significant growth in emerging sectors like the manufacture of motor vehicles, trailers, semi-trailers and other transport equipment, and the manufacture of rubber, plastic products and other non-metallic mineral products High levels of gross fixed capital formation, coupled with growth in FDI  Proportion of workforce with upper secondary and tertiary education is increasing	<b>Potential Targets</b> Target new niche markets, particularly abroad, with assistance from government and Malta Enterprise     Invest in new digital technologies to improve overall efficiency  Invest in R&D, including via collaborations with the University of Malta
<b>COVID-19 Impact</b> Delays in raw materials shipments and procurement, and social distancing measures, had significant initial impact on business operations and continuity Weak demand conditions and continued uncertainty will dampen demand for manufacturing products, both domestically and abroad, and may lead to postponement of investment		

Agriculture and fisheries		
<b>Challenges</b> Low levels of growth, particularly in crop and animal production, despite significant	<b>Opportunities</b> Aquaculture production has increased significantly in recent years	<b>Potential Targets</b> Direct marketing and selling of agricultural produce to Maltese consumers via online media

<p>economic expansion in Malta</p> <p>Low levels of productivity; very labour intensive relative to the EU average</p> <p>Difficulty in attracting new farmers to the sector due to nature of the work and low earnings</p> <p>Depletion of groundwater resources leading to higher abstraction costs</p> <p>Current waste slurry disposal practices in breach of EU directives</p>	<p>Rural Development Programme aimed at modernizing agricultural holdings and promoting investment, innovation and knowledge sharing</p>	<p>Increased investment in both physical and human capital within the sector, and promotion of organic farming</p> <p>Greater focus on the use of digital and automation tools to improve efficiency and attractiveness of sector</p> <p>Expand production of New Water for irrigation purposes</p> <p>Promote and implement circular economy solutions to slurry management</p>
<p><b>COVID-19 Impact</b></p> <p>Increased consumer demand for domestic produce outweighed by drop in purchases from restaurants and hotels due to lockdown</p> <p>Massive drop in exports of Maltese produce like potatoes, with prices and earnings plummeting</p> <p>Growing recognition of the importance of sector to domestic food security</p>		

Education		
<p><b>Challenges</b></p> <p>Plateau and subsequent drop in ELT student arrivals between 2017-2019</p> <p>Rising accommodation costs for foreign students</p> <p>Significant increase in wages and salaries in recent years</p>	<p><b>Opportunities</b></p> <p>Increased potential for online tuition</p> <p>Emergence of new tertiary education institutes setting up their operations domestically, typically affiliated with reputable foreign universities</p> <p>Growth in number of foreign workers and expats creates higher demand for private education</p>	<p><b>Potential Targets</b></p> <p>Invest in digital technologies for improved in-class teaching as well as the provision of online courses and tuition</p> <p>Market the ELT sector in new countries to diversify demand</p> <p>Actively promote Malta as a prime destination for education</p>

Low levels of productivity	Ongoing Brexit uncertainty will increase demand for tertiary education in English, particularly among third-country nationals	
<b>COVID-19 Impact</b> Collapse in ELT student arrivals due to lockdown and continued uncertainty likely to keep numbers low, with redundancies a growing possibility Short-to-medium term prospects for the sector depend on effective deployment of online resources and student appetite for distance learning		

Professional services		
<b>Challenges</b> High wage growth in recent years  Lack of human capital availability  High reliance on foreign workers	<b>Opportunities</b> High levels of investment in intellectual products and ICT equipment  Significant growth in recent years across all sub-sectors, particularly in other professional, scientific and technical activities; veterinary activities; advertising and research	<b>Potential Targets</b> Continued investment in digitization to improve workforce flexibility and operating efficiency  Establish the Maltese Islands as a centre of excellence for the provision of these professional services, particularly in light of Brexit
<b>COVID-19 Impact</b> Initial impact was small, but subsequent impact likely to be much larger due to exposure to other sectors like construction, gaming and financial services Remote working transition was relatively smooth, due to high levels of investment in enabling technologies Medium-term prospects linked to those of the rest of the economy – Services Confidence Indicator has plummeted		



# Chapter 2

## The economic impact of the COVID-19 pandemic



## **2.1 Short Term: A scenario-based analysis of the impact on the Maltese economy of Covid-19 for 2020: An application of input-output analysis**

The current extraordinary and unanticipated health and economic crisis is one which has influenced the day to day activities of most Maltese citizens at a very rapid pace and one which is having a heterogeneous impact on the various sectors across the economy. Drastic measures have been undertaken since the emergence of the COVID-19 pandemic over the months of March to June 2020, ranging from social distancing and the banning of public events, to shutdowns, lockdowns and restrictions on numerous activities. Following a decline in the number of active cases in June 2020 several of these measures had begun to ease, as policymakers proceeded to progressively lift them and reopen certain sectors of the economy. Although at the time of writing this report there are only a handful of published statistics on how the economy has responded to the crises, over this period, it is clear that household behaviour and spending patterns have been affected, and, that the wide closures or slowdown of economic activity experienced by firms may have triggered a decline in employment conditions, an increase in firms' liquidity needs and significant market disruptions (ECB, 2020).

Given the importance of tourism related activities within the Maltese economy, which contribute to approximately 12.0% of total gross value added, taking into account direct and indirect effects, and roughly 17.0% also accounting for the induced effects (Cassar et.al., 2016), the travel restrictions put in place locally and within several of the countries which account for the largest share of inbound tourism, together with the increased fear (and possibility) of a second wave emerging, will likely result in a significant deterioration of tourism demand over 2020. The impact of a substantial decline in tourism expenditure would inevitably create multiple ripple effects across the various other sectors of the economy which have strong linkages to tourism activities. It is important to note that the tourism sector over the recent years has expanded at a very rapid pace as the number of inbound tourists increased from 1.8 million in 2015 to 2.8 million in 2019. The retail trade sector will mostly likely also be significantly affected given a simultaneous decline in tourism expenditure coupled with an overall possible decline in household consumption expenditure. Another likely effect of the crisis pertains to the impact that it will have on firms operating in export-oriented manufacturing sectors as a result of an anticipated contraction in the global economy and the respective decline in trade flows, as well as possible disruptions to supply chains resulting from the measures implemented to mitigate the spread of Covid-19.

Furthermore, the persistence of high levels of uncertainty in relation to when the national and indeed the global economy will effectively bounce back coupled with a decline in anticipated revenues by firms will likely also lead to a notable fall in investment. All these factors suggest that the Maltese economy over 2020 is expected to experience a significant demand side shock.

The effect that the COVID-19 pandemic, and the respective global economic response to the pandemic itself, over 2020, will certainly, going forward, result in a very different economic reality when compared to that experienced by the Maltese economy in recent years. As discussed in this chapter of the report numerous economic sectors are expected to be negatively affected by current events in the short-term and possibly longer. Indeed, forecasts presented by various reputable national and international institutions and rating agencies between April 2020 and July 2020, such as those presented by the European Commission, the Ministry for Finance and Financial Services, the Central Bank of Malta, the International Monetary Fund and Fitch Ratings have all put forward forecasts<sup>1</sup> anticipating an economic contraction for 2020, ranging from a minimum of 2.8%<sup>2</sup> to a maximum of 6.9%<sup>3</sup>. On average, forecasts presented in July portray a markedly worse economic outlook than those presented at the earlier stages of the pandemic, in April 2020. It should also be noted the analysis put forward by these institutions focuses on aggregate components of the macro economy and omits to put forward an assessment of the possible effect that the pandemic may have on specific sectors in the economy.

As briefly discussed in Section 1.2 of this report, in order to appropriately formulate a policy strategy aimed at addressing the challenges ahead, given the multifaceted nature of the impact that the Covid-19 pandemic will have on the economy, it is important that assessment of the possible sector specific effects is also undertaken. As recommended by the ECB (2020), given the high uncertainty surrounding the economic impact of the COVID-19 pandemic, an analysis which aims to understand its impact on the economy should be undertaken on the basis of alternative scenarios. This approach is recommended in view of the high level of uncertainty surrounding the developments of the pandemic in particular the need for, and the effectiveness of

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<sup>1</sup> It should however be noted that the various forecasts may not be stickily comparable due to the differences in the availability of data across the forecasting exercises and the fact that they may be based on different methodologies.

<sup>2</sup> Put forward the IMF World Economic Outlook published in April 2020.

<sup>3</sup> Put forward by Fitch Ratings in July 2020.

containment measures (especially given the possible volatility in terms of the number of recorded infected cases a country may experience over time), and the possible emergence of medical treatments and solutions. Indeed, such uncertainties can be illustrated effectively via a scenario analysis, based on broad descriptions for a number of factors, such as the impact on tourism demand, consumer demand, health considerations and the impact on global trade, which would be assumed to characterise various aspects of the uncertainty surrounding the impact of the COVID-19 pandemic and thus allow for their economic impact.

The scenario-based analysis presented in this section will thus estimate the impact of three assumed scenarios on the economy, presenting an analysis in terms of changes in the level of output production and gross value added generated compared to the levels actualised in 2019. In order to undertake this short-run analysis, the Leontief demand driven input-output model is employed (Miller and Blair, 2009). This model may be defined as a fixed price general static equilibrium model and it has been extensively utilised in the literature to undertake impact analysis especially in the short run. It should be noted that this specific input-output model is not particularly well suited for a medium run impact analysis given that it does not allow to model for any supply side properties of the economy and does not exhibit any dynamic characteristics. A significant advantage of this input-output model is that the resulting scenario estimates will capture not only the direct effects of the assumed final demand but also the indirect effects on production. These estimates acknowledge the fact that a decline in demand for a sector's output has a greater impact on the economy than just the direct impact on the sectors production since there are wider knock on effects on other industries. If there is a decrease in demand, and thus output, for a particular product or service, there will also be a decrease in demand on their suppliers and so on down the supply chain, resulting in a further decline in production, this is the indirect effect. Furthermore, given that this methodology allows for the transmission of shocks across the existing interindustry linkages, even those sectors which are not directly influenced by the assumed shock to final demand, will implicitly also be affected because of their interlinkages to the industries which will be shocked. This implies that the full magnitude of the shock across all sectors would be captured and measured, even from those sectors which are not initially directly affected as a result of the assumed scenario-based decline in final demand.



### 2.1.1 The Leontief demand driven model

The input-output model utilised for the analysis undertaken is the Leontief demand driven model (Miller and Blair, 2009) which is a deterministic type of model. In input-output analysis the economy is broken into sectors (or industries) and the flow of goods and services among sectors or industries is registered to indicate systematically the relations among them. By decomposing an economy into finer units (sectors), input-output techniques are capable of tracing out effects undetected in traditional macroeconomic analysis, which focuses on the changes of aggregate variables rather than the effect of these changes on the composition, across the various sectors, of the aggregate variable. Input-output methodology was originally put forward by Nobel Laureate Wassily Leontief (1936) and has since been applied to numerous fields of economic research such as:

- The study of structural change - Blair, P.D. and Wyckoff A.W., (1989). The changing structure of the US economy. An input-output analysis. Cited in: Miller R.E., Polenske K.R. and Rose A.Z. (eds.), *Frontiers of Input-Output Analysis*. Oxford University Press, New York, pp. 293-307.
- Tourism industry analysis - World Travel & Tourism Council, (2015). *Methodology for producing the 2015 WTTC/ Oxford Economics Travel & Tourism Economic Impact Research*. Published by Oxford Economics, March 2015.
- Industry multiplier analysis - Cassar, I. P., & Rapa, N. (2018). Estimates of input-output multipliers for the Maltese economy based on the symmetric input-output table for 2010. *Xjenza*, 6(2), 70-85.
- Scenario Analysis – Santos (2020). Using input-output analysis to model the impact of pandemic mitigation and suppression measures on the workforce. *Sustainable Production and Consumption*, Volume 23, July 2020, pages 249-255.

The application of this modelling framework requires the use of a symmetric input output table (SIOT). A SIOT records the economy's inter-industry transactions via the disaggregation of the economic activity into a number of individual 'n' sectors or industries representing the various producing sectors of the economy. The core data required to populate the Leontief demand driven model essentially consists of the flows of products from each of the 'n' producing sectors to each of the 'n' sectors purchasing input requirements in order to undertake the production of output. The flow of products

amongst the ‘n’ producing sectors of the economy is what is referred to as inter-industry flows (or transactions) – for example, €1 million worth of products sold from the agricultural sector to manufacturing sector. The input-output table is therefore a dataset which essentially traces the monetary values of the numerous transactions amongst the pairs of sectors for a given year.

Generally, an SIOT which is going to be applied for input-output analysis consists of three main components, a domestic intermediate consumption component, a final demand (net of imports) component and a primary inputs component. The domestic intermediate consumption component of an industry-by-industry SIOT describes the uses of goods and services required by each industry in order to produce its output (net of imports). The final demand (or final use) component net of imports, illustrates the purchases of output made by the main classifications of final demand, namely household consumption expenditure, government consumption expenditure, gross capital formation and exports from the domestic producing sectors. The final component of the SIOT is referred to as the primary inputs’ component. This last component is composed of the gross value added generated by each industry, the imports of goods and services purchased by each industry and the taxes less subsidies on products attributable to the purchases of inputs by each industry, which are required in order to convert the valuation of the intermediary inputs from basic prices to purchasers’ prices.

As described in further detail within [appendix 2.2](#) the solution to the Leontief demand driven model<sup>4</sup> may be obtained by applying the following equation expressed in matrix algebra notation:

$$x = (I - A)^{-1} f = L f$$

The solution to the Leontief demand driven model therefore implies that, given the Leontief inverse matrix, the amount of total output ‘x’ produced is determined solely by the structure of final demand, ‘f’. Final demand (or final use) vector illustrates the purchases of output made by the main classifications of final demand. The first step for the estimation of the impact of the Covid-19 pandemic on the Maltese economy for

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<sup>4</sup> The model employed is referred to as the Open Leontief demand driven model (Miller and Blair, 2009). It was decided not to employ the closed Leontief demand driven model given that it is clear that the Covid-19 pandemic will alter income-expenditure patterns in 2020. This implies that utilizing the closed Leontief demand driven model would have resulted in employing the rather implausible assumption that these patterns have remained constant since the reference year of the SIOT.

2020 (i.e. the short term) would thus entail generating the balance equation of the Leontief demand driven model, on the basis of an SIOT for the Maltese economy. Secondly it would require the construction of a scenario-based level of final demand, for each sector under consideration, for each scenario being modelled. The final step would entail the post multiplication of the scenario-based vectors of final demand to obtained Leontief Inverse Matrix which would generate a vector of output yielding the simultaneous impact on production levels, on all sectors, of the entire assumed scenario. In order to quantify the resulting levels of sectoral output, into gross value added (GVA), the assumption of sector specific constant GVA to output ratios, for the year of 2019, was employed. Furthermore, in order to undertake the scenario-based analysis these sectoral ratios were assumed to remain constant between 2019 and 2020.

### **2.1.2 Data employed and scenario Identification process**

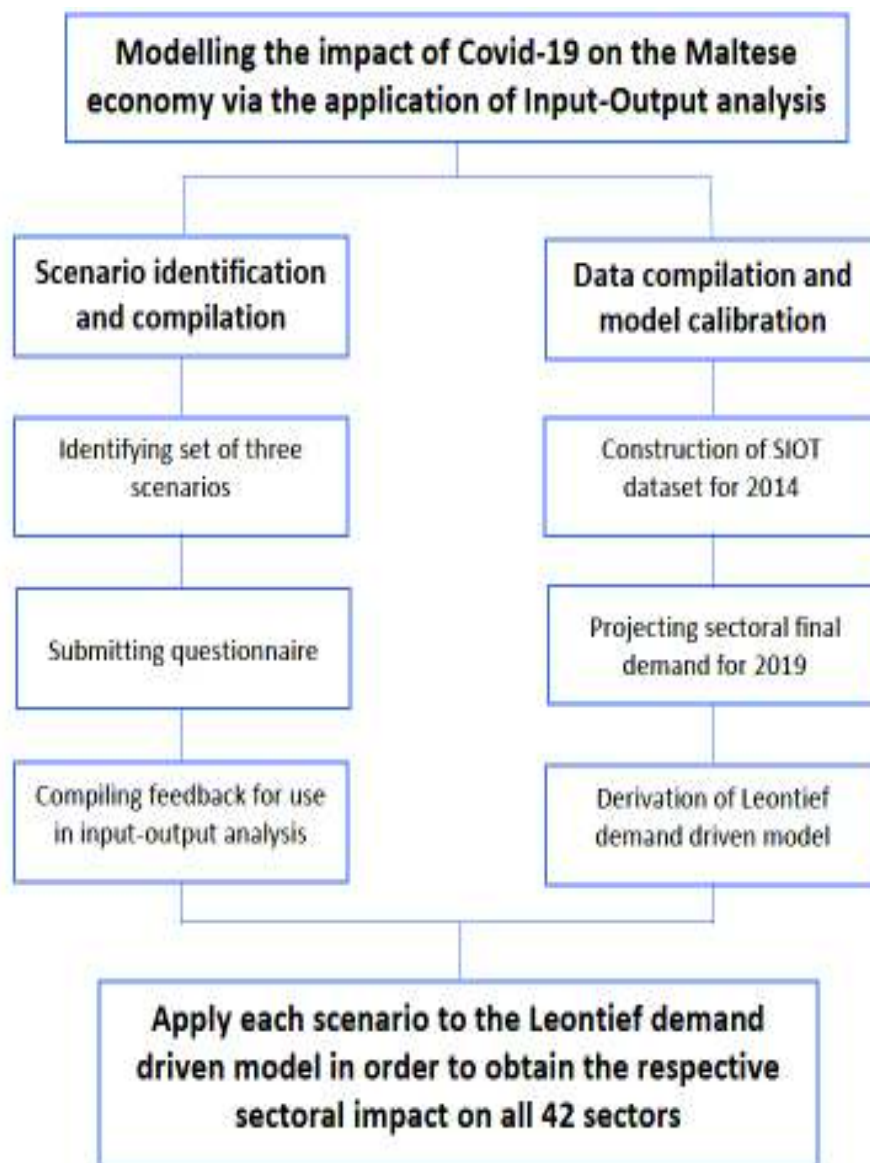
The application of input-output techniques generally requires the utilization of a SIOT. As previously noted, a SIOT is an observed dataset illustrating the inter-industry transactions for a specific geographic region measured for a particular time period (usually one year) and which is generally recorded in monetary terms. The analysis in this study is based on an industry-by-industry SIOT for the reference year of 2014, which was constructed by application of the RAS input-output matrix updating methodology<sup>5</sup> (Miller and Blair, 2009) applied to the latest SIOT published (in May 2016) for the Maltese Economy by the National Statistics Office of Malta, which is that of the reference year for 2010. It should be noted that input from the National Accounts Unit of the NSO was crucial for identification of the additional data required to apply this method and thus generate an SIOT for the reference year of 2014. The resulting SIOT for Malta for 2014 has a 42 industry-by-industry level of disaggregation which follows in large part the classification according to the European Statistical Classification of Economic Activities (NACE)<sup>6</sup> Rev.2. The sectoral classification employed is presented in [appendix 2.3](#)

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<sup>5</sup> Refer to appendix 2.1 for detailed explanation of how the SIOT for 2014 was constructed.

<sup>6</sup> The European Statistical Classification of Economic Activities (NACE) Rev 2.

**Diagram 2.1: Approach undertaken to implement the scenario-based impact analysis**



*Source: Authors*

As discussed in [appendix 2.1](#) the compilation process of the SIOT for 2014 allowed for the derivation of the matrix of technical coefficients (A), which as explained in [appendix 2.2](#), is a key matrix required for the derivation of the Leontief Inverse Matrix. The Leontief Inverse Matrix is assumed to represent and capture the inter-industry linkages across the Maltese economy, which are unpinned by the structure of the



economy in 2014<sup>7</sup>. As shown in [diagram 2.1](#), the final step required to complete the input-output and data compilation stage process and thus to be able to apply the impact analysis is that of projecting<sup>8</sup> a vector of sectoral final demand for the 42 sectors for 2019. Since this study aims to assess the possible impact of the Covid-19 pandemic on the Maltese economy (in 2020), the impact of the pandemic had to be quantified in relation to the levels of sectoral output generated in 2019. In order to apply the Leontief demand driven model, a vector of final demand for 2019, which would allow for the sectoral modelling of the various identified scenarios, was required. This vector was projected on the assumption that sectoral final demand between 2014 and 2019 grew at the same pace as sectoral output<sup>9,10</sup>.

The scenario identification and compilation process, which is illustrated in [diagram 2.1](#), necessitated three distinct steps. The first step entailed the identification of three scenarios which would capture the possible implications of the Covid-19 pandemic on the economy, and thus the respective criteria which would characterise the various scenarios. These scenarios, which are summarised in Table 3.1 were identified based on the expert judgement of the authors of this report and on the feedback received from various stakeholders forming part of the NPB. A more detailed explanation of these scenarios is presented in [box 2.1](#).

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<sup>7</sup> It is the opinion of the authors of this study that there were no major technological shifts or significant shocks to the economy between 2014 and 2019 which could give cause to a widespread change in production processes. Therefore, the assumption of fixed technical coefficients across these two time periods is indeed a plausible one, and thus should allow for the applicability of the Leontief demand driven model.

<sup>8</sup> The vector for final demand by sector for all 42 sectors for 2019 had to be estimated given that it is not available from the NSO.

<sup>9</sup> This assumption was employed on the basis that the final demand component on average, across all 42 sectors of the SIOT, for the Maltese economy, accounts for approximately 63.8% of output production. It should also be noted that the time series for sectoral output growth was kindly provided by the NSO.

<sup>10</sup> A sensitivity analysis was carried out to compare the aggregate level of output obtained from the post multiplication of the projected vector of final demand for 2019 with the Leontief inverse based on the SIOT for 2014 and the difference in the level of aggregate output obtained compared to observed total output for 2019 was that of 3.6% (as a % of the observed total output level).

**Table 2.1: The three selected scenarios**

Criteria	Scenario 1	Scenario 2	Scenario 3
Contraction in Consumer Demand	10%	20%	30%
Health Considerations	Risk of illness and spread is very low and fully contained with the vaccine available in fourth quarter of 2020.	Risk of illness and spread is low to moderate (partially contained). Information is made public that vaccine would be available at end of first quarter 2021.	Risk of a second wave and spread is higher as of July 2020 than registered so far. Information is made public that the vaccine would only be available in mid-2021.
Tourism	Limited travel in safe corridors as of early July 2020. Open for all destinations with minimal restrictions as of September 2020. Airport has been reopened but some restrictions still remain which make travel an inconvenience. Stabilization of tourism activity is expected to take 18 months.	Despite airport opening in early July restrictions make traveling within safe corridor destinations difficult for the next 24 months.	Open in early July (as in scenario 1) but a number of key strategic airports to remain inaccessible until end 2020. Stabilization of tourism activity post Covid-19 is expected to take 24 months.
Global Trade Decline in 2020	10%	20%	30%

Source: Authors

### Box 2.1 Description of Scenarios

This box provides an explanation of why the three scenarios presented in Table 3.1 were chosen. In this first instance, a three-scenario approach was deemed as a reasonable method for evaluating different scenarios of how COVID-19 could impact on the selected criteria, namely on consumer demand, health consideration, tourism and global trade decline in 2020. These criteria are particularly relevant for the Maltese economy given the high level of consumer demand that has fuelled economic growth in recent years. Second, the health effects of COVID-19 are directly related to economic activity in that if the virus spreads, health authorities react by restricting economic activity to prevent contagion. Third, an economy like Malta depends heavily on tourism, and hence tourism inevitably features as one of the criteria. Finally, given the openness of Malta's economy, any decline in global trade is *a priori* expected to impact trade between Malta and the rest of the world. This is particularly relevant both in terms of exports and imports with Malta having one of the highest levels of trade.

It should be noted that the scenarios do not incorporate the responses that Government policy is taking or may take to mitigate the effects of COVID-19 and the restrictive measures that have been applied since its outbreak to prevent contagion. Those measures and their effectiveness are discussed at length and analysed in Section 1.1 and include measures adopted at EU level as well. However, we are here capturing short-term scenarios and hence both the criteria and the predicted scenarios are deemed realistic enough and particularly relevant to the Maltese Islands.

As stated, health considerations are particularly important, and under Scenario 1 the risk of illness and spread is very low and fully contained with the vaccine available in fourth quarter of 2020. This is somewhat optimistic given recent turn of events and the availability of a vaccine in the fourth quarter appears unlikely. In Scenario 2, the risk of illness and spread is assumed to be low to moderate (partially contained) with a vaccine being rolled out at end of first quarter 2021. This Scenario appears more realistic, but it should be stressed that as winter approaches this has raised fears that coronavirus will surge when the seasons change, possibly leading to a further wave of the virus that is even bigger than what we have experienced so far. However, predicting what a COVID winter will look like is complex and uncertainty reigns - there are reasons both to be worried and to be reassured. Indeed, how bad the winter will be is dependent not only on the coronavirus, but on what happens to all the other winter related sickness, our own behaviour, and the success or failures of Government policy. There is also the relatively new field of science showing one viral infection can potentially block another one, with still unknown implications for coronavirus. All this uncertainty explains why in Scenario 3 a risk of a second wave and spread that is higher as of July 2020 than registered so far, is assumed. Under this Scenario a vaccine would only be available in mid-2021

Now if we take consumer demand, Scenario 1 represents a somewhat optimistic scenario with demand falling by 10 per cent, with demand falling by 20 and 30 per cent respectively in Scenarios 2 and 3. Scenario 3 may be deemed as unlikely given the high levels of demand that have characterised consumption patterns in the Maltese economy in recent years. Nonetheless, it makes sense to consider all three scenarios given the high number of individuals put on furlough since the outbreak of the pandemic and the high levels of employment in the accommodation and hospitality sector.

Insofar as tourism is concerned, Scenario 1 represents limited travel in safe corridors as of early July 2020, open for all destinations with minimal restrictions as of September 2020. Airport has been reopened but some restrictions still remain which make travel an inconvenience. Stabilisation of tourism activity would be expected to take 18 months. Again, given the very recent experience and the increase in COVID-19 cases following the opening of the airport (though it must be stressed that a direct correlation has not been scientifically proved), this Scenario is now appearing increasingly unrealistic and hence Scenario 2 which assumes that travelling within safe corridor destinations is difficult for the next 24 months, is now closer to the real situation. Under Scenario 3, despite the airport opening in early July, a number of key strategic airports are assumed to remain inaccessible until end 2020. With stabilisation of tourism activity post Covid-19 expected to take 24 months. The latter is now appearing more realistic given that operators are expecting reduced tourism flows in the winter months and the first quarter of 2021.

The assumed global trade decline scenarios are consistent with assumptions being made by international organisations such as the World Bank and the International Monetary Fund and anywhere between 10 and 20 per cent is deemed very realistic. The decline in global trade obviously impacts economies that are highly dependent on trade as is the case with the Maltese economy.

The next step entailed the formulation of the assumed impact that these scenarios would have on the final demand of those sectors<sup>11</sup> mostly and directly impacted by the COVID-19 pandemic. To this end a questionnaire<sup>12</sup> was put forward to the various institutions which are linked to the NPB<sup>13</sup>. This questionnaire<sup>14</sup> requested the various institutions to provide estimates of the anticipated decline in final demand that specific selected sectors may experience over 2020, on the basis of the three scenarios identified. Each institution was expected to provide the required estimates for those

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<sup>11</sup> The list of selected sectors may be observed in appendix 2.5.

<sup>12</sup> The questionnaire may be found in appendix 2.4.

<sup>13</sup> Representatives from the following institutions were asked to fill in the questionnaire: The Malta Council for economic and social development (MCESD), the General Workers Union (GWU), the Union Haddiema Magħqudin (UHM), Forum Unions Maltin, the Malta Employers Association (MEA), the Malta Chamber of Commerce, the Malta Chamber of SMEs, The Malta Hotels and Restaurants Association (MHRA), The Ministry for Finance and Financial Services, and the Central Bank of Malta.

<sup>14</sup> It should be noted that the questionnaire was distributed and had to be completed throughout the month of June 2020.

sectors/industries which are within the main area of competence and expertise of the respective institution. The final selected assumed decline in final demand per sector for each scenario<sup>15</sup> was then compiled on the basis of a sector specific weighting system<sup>16</sup>, which was applied to the estimates received within the completed questionnaires from the various institutions. Although the various policies and measures put forward to counteract the negative economic impact of the pandemic on the economy, which are discussed in Section 1.1 of this report, are not directly modelled into the framework employed, the input from the various institutions in relation to the sectoral impact of the pandemic is assumed to implicitly embody their expectations relating to the effectiveness of such measures at the time the questionnaire was distributed.

### **2.1.3 Results of scenario-based analysis**

This section presents the results obtained from the scenario-based impact analysis for the three modelled scenarios. The results presented in this section compare the scenario-based estimates obtained in relation to the observed values of the corresponding figures actualised in 2019<sup>17</sup>. The section shall commence with an overview of the respective impact of each assumed scenario on the aggregate level of output production and gross value added generated in the economy. A sectoral analysis will follow, which describes the sectoral impact of each scenario, on both output production and GVA generated. Subsequently, an analysis in terms of the decline in sector specific GVA is put forward in order to gain a better understanding of the relative magnitude pertaining to the sectoral impact resulting from each scenario. It should be noted that the sectoral analysis presented in this section illustrates the impact of the assumed shock to final demand, based on each specific scenario applied<sup>18</sup>, which is occurring across all sectors simultaneously. Moreover, given that the resulting estimates are obtained via the application of the Leontief demand driven model this implies that the resulting impact encompass not only the direct impact on

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<sup>15</sup> The resulting assumed decline in final demand per sector, based on the feedback received from the various stakeholders which took part in the questionnaire which incorporates their significant sectoral expert knowledge and insight is presented in appendix 2.5.

<sup>16</sup> The sector specific weighting system was based on the authors' expert judgment in relation to the assumed sector specific knowledge of the respective institutions. Due to issues of confidentiality the applied weighting system cannot be published.

<sup>17</sup> Figures obtained from the NSO.

<sup>18</sup> Refer to appendix 2.5 for the scenario specific assumed contraction in sectoral final demand.

production (and GVA) as a result of the assumed shock in final demand, but also the indirect effects on production (and resulting effects on GVA generated) which are underpinned by the various interindustry linkages across the production structure of the Maltese economy.

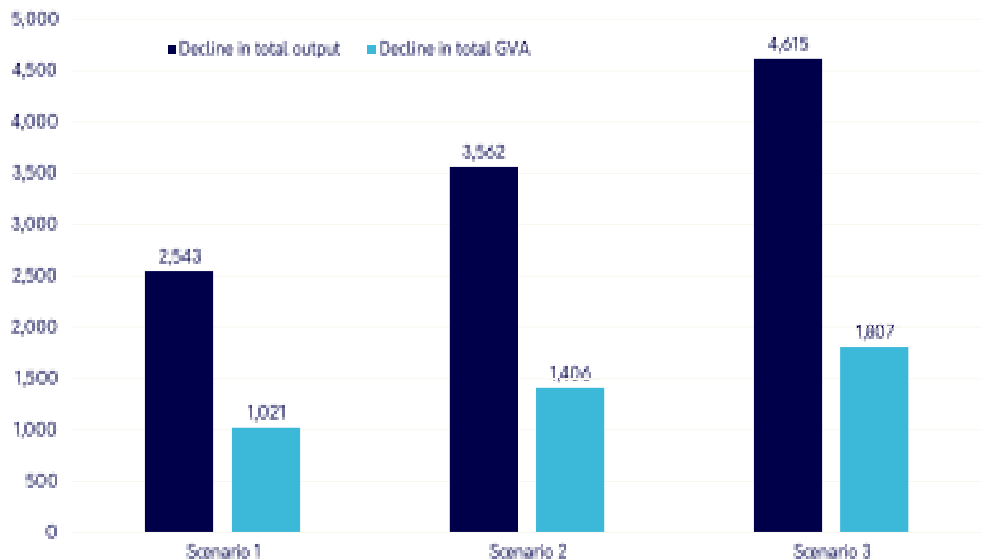
#### **2.1.3.1 Impact on aggregate output and GVA**

The resulting estimates from the scenario-based impact analysis indicate that the Maltese economy, in the aggregate, could potentially experience a decline in total GVA within the range of 8.7% (scenario 1) and 15.3% (scenario 3) in 2020 compared to the levels actualised in 2019. This equates to a loss in the amount of GVA generated in the economy of between 1.0 billion euro (scenario 1) and 1.8 billion euro (scenario 3). Output production, which is composed of the production of both intermediary goods and services<sup>19</sup> and goods and services for use in final demand, is estimated to decline between 7.5% (scenario 1) and 13.6% (scenario 3) in 2020. This equates to a loss in output production of between 2.5 billion euro and 4.6 billion euro between 2019 and 2020. [Chart 2.1](#) and [Chart 2.2](#) put forward the resulting aggregate estimates for all three scenarios in level and in percentage terms, respectively. These estimates were obtained by aggregating the individual sectoral results for each scenario applied.

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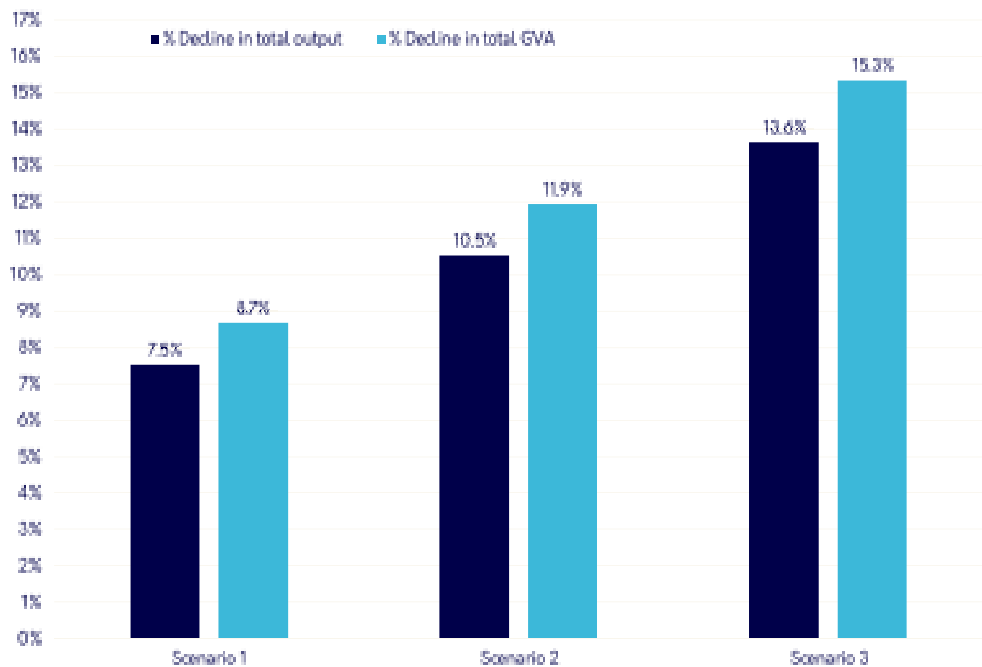
<sup>19</sup> Intermediary goods are goods produced by one firm/industry which are utilised as inputs in the production process of another firm/industry.

**Chart 2.1: Scenario based impact analysis of the Covid-19 pandemic on the aggregate levels of output and GVA (Million Euro)**



Source: Authors

**Chart 2.2: Scenario based impact analysis of the Covid-19 pandemic on aggregate output and GVA (Percentage Terms)**

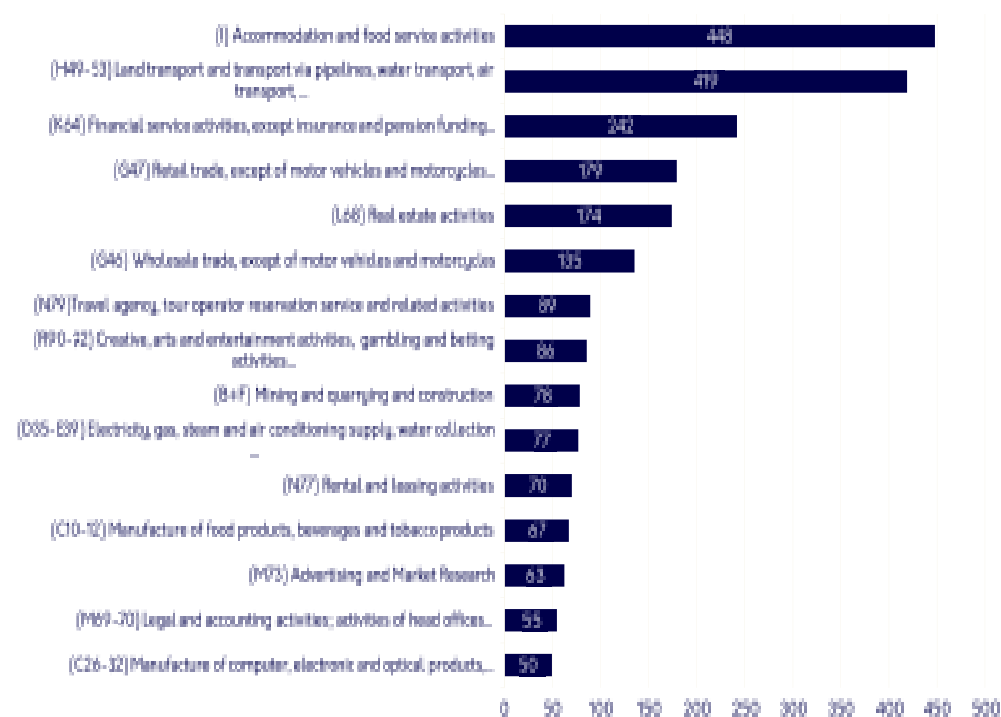


Source: Authors

### 2.1.3.2 Sectoral analysis of impact on output production and gross value added

**Chart 2.3** illustrates the impact on the level of output production, in million euro, of the 15 sectors which are estimated to experience the largest decline in output production (in absolute terms) based on scenario 1. The corresponding estimates for all 42 sectors, generated on the basis of the three scenarios, are provided in [appendix 2.6](#). From **chart 2.3** it may be observed that the sector expected to experience the largest decline in output production, compared to the levels generated in 2019, at 448 million euro, is the (I) Accommodation and food service activities sector, followed by, the (H49-53) Transport and storage activities sector and the (K64) Financial services sector (except insurance and pension funding), at 419 million euro and 242 million euro respectively.

**Chart 2.3 Decline in output levels based on scenario 1 (Top 15 sectors) in million Euro**



Source: Authors



**Chart 2.4** illustrates the impact on the level of GVA, in million euro, of the 15 sectors which are estimated to experience the largest decline in GVA (in absolute terms) based on scenario 1. The corresponding estimates for all 42 sectors, generated on the basis of the three scenarios are provided in [appendix 2.7](#). From [chart 2.4](#) it may be observed that the sector expected to experience the largest decline in GVA relative to the level generated in 2019, at €182.0 million, is the (I) Accommodation and food service activities sector, followed by the (H49-53) Transport storage activities sector and the (L68) Real estate activities sector at €131.0 million and €124.0 million, respectively.

**Chart 2.4 Decline in gross value added (GVA) levels based on scenario 1 (Top 15 sectors) in million Euro**

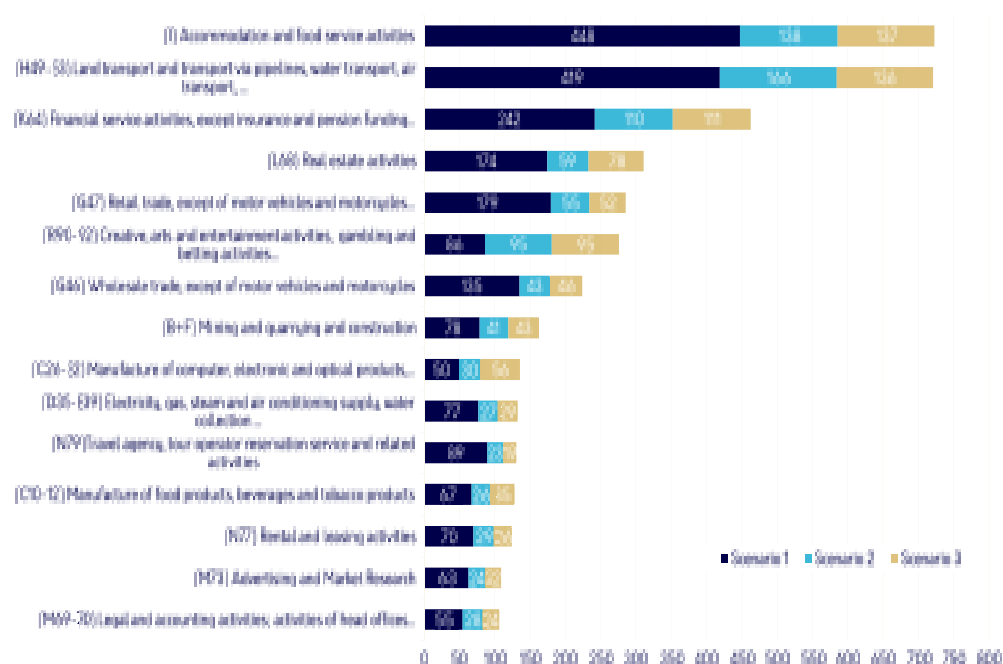


Source: Authors

**Chart 2.5** illustrates the impact on the level of output production, in million euro, on the top 15 sectors which are estimated to experience the largest decline in output production (in absolute terms) based on scenario 3. This chart provides a disaggregation of the corresponding loss in output production resulting from the occurrence of each scenario. For example, on the basis of scenario 3 the sector

expected to experience the largest decline in output production, compared 2019, at €723.0 million, is the (I) Accommodation and food service activities sector. From [chart 2.5](#) it may be observed that €448 million of this loss would be the estimated impact of scenario 1 materialising, an additional loss of €138.0 million would be expected if scenario 2 were to materialise bringing the total to €586.0 million and a further €137.0 million in loss of output would be expected if, on the other hand, scenario 3 were to materialise, the total impact would amount to a loss of €723.0 million. This analysis therefore provides a range of the possible impact on the (I) Accommodation and food service activities sector of between €448.0 million and €723.0 million in terms of loss in production over the range of specified scenarios. The corresponding estimates for all 42 sectors, generated on the basis of the three scenarios, are provided in [appendix 2.6](#). Similarly, [chart 2.6](#) illustrates the impact on GVA, in million euro, on the top 15 sectors which are estimated to experience the largest decline in GVA (in absolute terms), based on scenario 3.

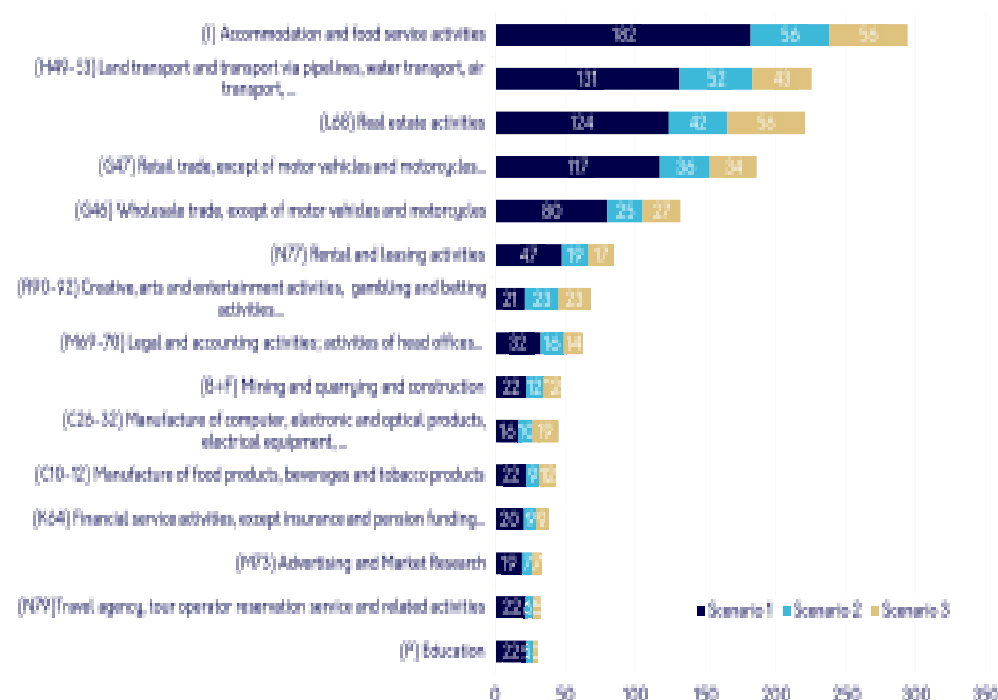
**Chart 2.5 Decline in output levels across the three scenarios (Top 15 sectors) in million Euro**



Source: Authors

From [chart 2.6](#) it may thus be noted that the (I) Accommodation and food service activities sector is estimated to experience a decline in GVA of €182 million if scenario 1 were to materialise, an additional loss of €56 million is estimated to occur if scenario 2 were to materialise and a further decline in GVA of €56 million if scenario 3 were to materialise, amounting to a total decline in GVA of €294 million euro.

**Chart 2.6 Decline in GVA across the three scenarios (Top 15 sectors) in million Euro**



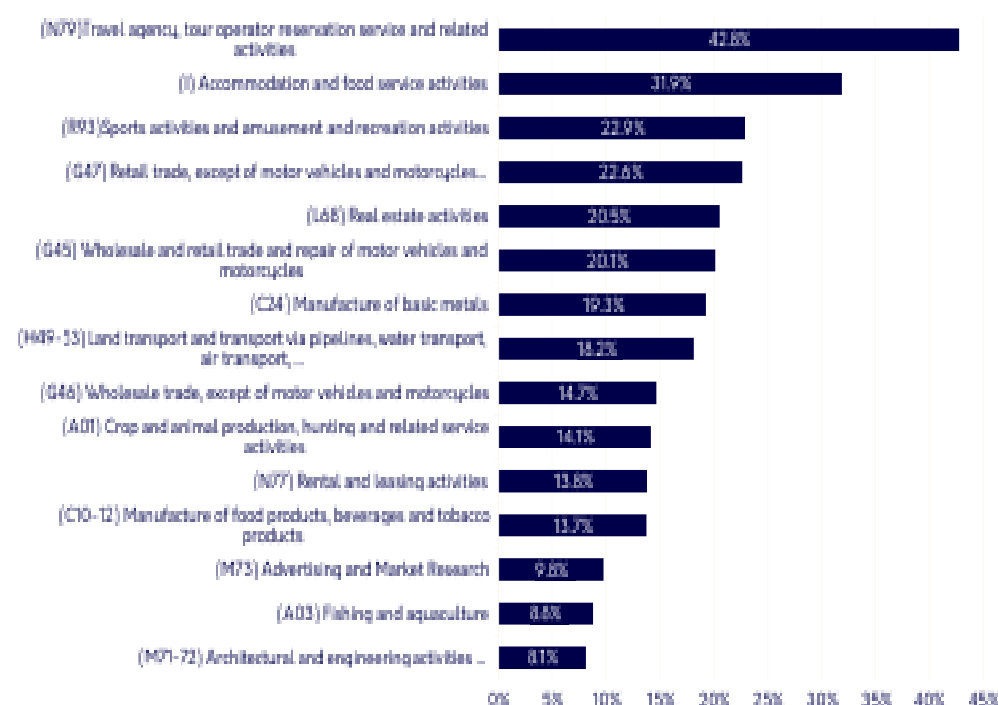
Source: Authors

### 2.1.3.3 Relative impact on sector specific levels of Gross Value Added

In order to gain a better understanding of the relative magnitude and impact that each scenario is estimated to have across the 42 sectors it is important from a policy formation perspective to also assess how each estimated loss in GVA relates to the sectors own level of GVA generated. This ratio could provide an insight into the relative degree of struggle and respective challenges that each specific sector may experience over 2020 as a result of the COVID-19 pandemic. [Chart 2.7](#) and [chart 2.8](#), illustrate

the top 15 sectors<sup>20</sup> which are estimated to experience the largest percentage decline in the generation of their own sector specific level of GVA, compared to that generated in 2019, based on scenario 1 and scenario 3, respectively.

**Chart 2.7 Decline in sectoral GVA based on scenario 1 (Top 15 sectors) in percentage terms**



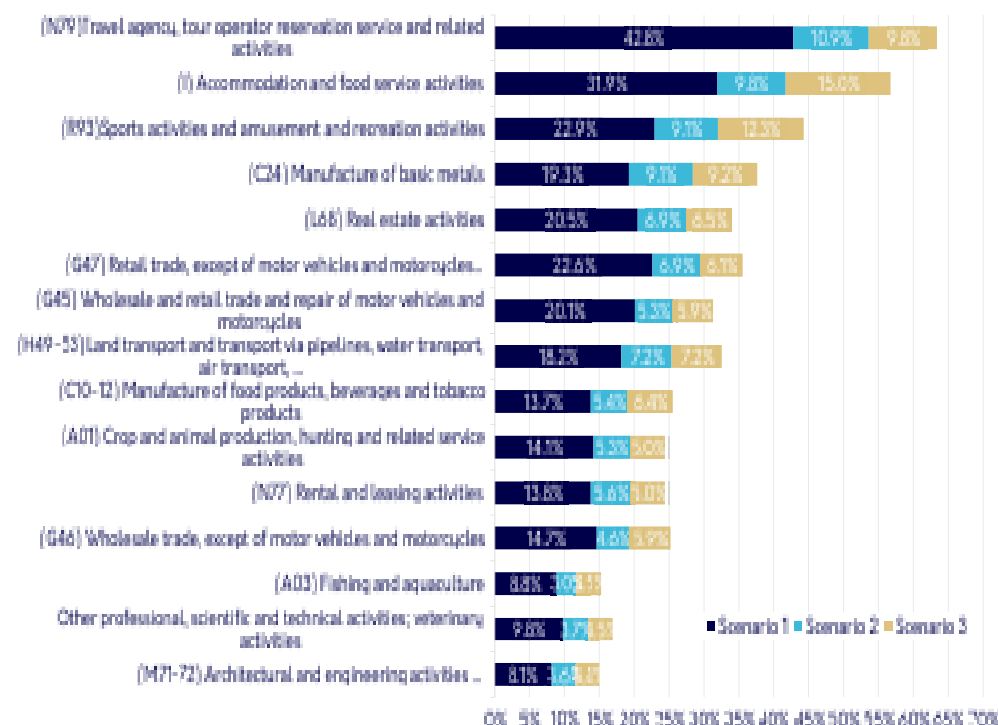
Source: Authors

The (N79) travel agency, tour operator reservation service and related activities sector, the (I) Accommodation and food service activities and the (R93) Sports activities and amusement and recreation activities are the three sectors which are estimated to experience the largest percentage decline in their own levels of GVA, based on all three scenarios put forward. From [chart 2.7](#), it may be observed that based on scenario 1 these three sectors are estimated to experience a contraction in GVA of approximately 42.8%, 31.9% and 22.9%, respectively. However, extending this analysis to the other two scenarios, it may be noted that for these three sectors (N79, I and R93), the decline in GVA would increase to 53.7%, 41.7% and 32%, respectively if scenario 2 were to materialise. If on the other hand, scenario 3 were to materialise,

<sup>20</sup> The results for all 42 sectors are presented in appendix 2.8

the decline in GVA these sectors (N79, I and R93) would equate to 63.5%, 56.7% and 44.3%, respectively. The estimates provided in [appendix 2.8](#) provide the estimated impact that the Covid-19 pandemic, in terms of the relative generation of sectoral GVA obtained on the basis of the three specified scenarios across all 42 sectors/industries, which characterise the Maltese economy on the basis of the SIOT.

**Chart 2.8 Decline in sectoral GVA across the three scenarios (Top 20 sectors) in percentage terms**



Source: Authors

#### 2.1.3.4 Main conclusions from the scenario-based impact analysis

The results obtained from the scenario-based analysis indicate that over 2020 the Maltese economy may experience a contraction in aggregate GVA ranging between 8.7% and 15.3%. It should be noted that notwithstanding the various assumptions and limitations of both the modelling framework and the data employed for this analysis, the anticipated negative shock to the economy will likely be of a magnitude which is unprecedented in Maltese history post the Second World War. Extending the analysis put forward to estimate the impact on GDP is possible, once we recognise that GDP is

the sum of GVA, which on average between 2000 and 2019 accounted for 87.8%<sup>21</sup> of total GDP, and taxes less subsidies on products. Estimates of taxes less subsidies on products were projected by employing the robust<sup>22</sup> assumption that taxes less subsidies on products followed the same trajectory as output production over the three scenarios. The resulting estimates for the impact of the Covid-19 pandemic on GDP indicate a contraction in real GDP<sup>23</sup> ranging between 8.6% and 15.1%<sup>24</sup>. These estimates indicate that the negative impact of the Maltese economy will be of a far greater magnitude than that experienced in 2009 as a result of the global financial crisis, whereby real GDP had contracted by solely 2.5%<sup>25</sup>.

From the sectoral results put forward in this section and presented within [appendices 2.6, 2.7 and 2.8](#) it is clear that irrespective of which scenario is being assessed the resulting impact of the Covid-19 pandemic is going to have a heterogeneous impact across the various industries/sectors of the economy. The sectors of the economy which are expected, on average, to be the most impacted are those sectors which are directly related to tourism activities or indeed sectors which exhibit strong interindustry linkages to those sectors involved in tourism related activities. It should be noted that whereas, in absolute terms, some sectors are estimated to incur significant declines in output production and GVA, it may be the case that in relation to the size of the sector itself, such level declines may result in having only a relatively minor impact on the sector itself<sup>26</sup>. Conversely, there are a number of sectors, such as, for example, the (R93) sports activities and amusement and recreation activities sector, the (C24) manufacture of basic metals sector, the (A03) fishing and aquaculture sector and (A01) Crop and animal production, hunting and related service activities sector, which

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<sup>21</sup> Statistic calculated on the basis of data obtained from the AMECO database of the European Commission.

<sup>22</sup> Given the uncertainty surrounding several aspects pertaining to various developments pertaining to the component of taxes less subsidies on products, this robust assumption was employed and deemed plausible on the basis of a resulting Pearson product moment correlation coefficient amounting to 0.99, which was obtained between the datasets of taxes less subsidies on products and output production, for the period covering 1995 and 2019, for the Maltese economy.

<sup>23</sup> The estimates obtained may be viewed as a change in real GDP given that only two periods are being assessed and that the Leontief demand driven model applied is a quantity model as such prices are assumed fixed.

<sup>24</sup> A contraction of 8.6% on the basis of scenario 1, 11.7% on the basis of scenario 2 and 15.3% based on scenario 3.

<sup>25</sup> Statistic calculated on the basis of data obtained from the Central Bank of Malta historical annual database.

<sup>26</sup> For example, the (K64) Financial services (except insurance and pension funding) sector the €22 million decline estimated for scenario 1 which equates to a sectoral contraction in GVA of 4.3%.

although in level terms, compared to other sectors, might not seem to have been impacted significantly by the respective scenario, once we account for the relative size of the sector may actually be experiencing a significant contraction in their respective economic activity. There are also number of sectors for which no shock to final demand was directly modelled within the scenario analysis<sup>27</sup>, but which are nonetheless anticipated to experience sizeable declines in output and GVA. This is due to the strong interindustry linkages that these sectors exhibit with those sectors directly impacted by the COVID-19 pandemic within the scenario-based analysis. Such sectors include the (N78) Employment activities sector and the (N80-82) Security and Other Administrative activities sector.

## **2.2 Medium term: A scenario-based analysis of the impact of Covid-19 on potential output: A production function approach**

The analysis put forward in section 2.1 aimed to assess the sectoral impact of the COVID-19 Pandemic in the short run utilising a scenario-based analysis applied to a Leontief input-output modelling framework. This framework is well suited to capture demand side shocks in the short run, but due to its underlying assumptions and limitations it is not appropriate for a medium-term assessment of the impact on the economy as a result of possible supply side shocks which could stem from the COVID-19 pandemic. Shocks can take the form of either demand or supply side shocks. Examples of demand side shocks include a temporary loss in consumer confidence (a negative shock) leading to lower level of consumption, or a temporary increase in the demand for tourism demand (i.e. an increase export; a positive shock). These shocks are generally short-term effects and do not change the equilibrium growth path or the trajectory of potential output growth of an economy. However, unlike demand side shocks, there are many types of supply side shocks which can lead to more permanent effects, since they may influence the labour force, capital formation and productivity (Kennedy et al. 2006). Such shocks would indeed have the capacity to impact the trajectory of potential output in the medium to long term.

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<sup>27</sup> Refer to appendix 2.5.

According to the European Commission (COM, 2014), potential output<sup>28</sup> constitutes the best composite indicator of the aggregate supply side capacity of an economy and is usually defined as the highest level of output achievable without generating inflationary pressures in factor markets. The trajectory of potential output growth is largely driven by productivity and employment growth. Productivity, as will be discussed in more detail within chapter 4 is contingent on the size of physical capital stock (which itself depends on credit conditions and the investment environment), the state of technological progress, and the education level of the labour force (human capital). Employment growth on the other hand reflects population growth and dynamics (which are underpinned by migration, mortality rates and birth rates,) the age composition of the population, the participation rates of the various age groups, and the efficiency of the labour market (Kennedy et al. 2006). Although the resulting medium-term impact of COVID-19 on the Maltese economy is still surrounded by a high degree of uncertainty, a number of likely supply side shocks may be identified:

- Reduced hours of work, rising unemployment and lower employment growth resulting from a decline in domestic and foreign final demand
- Decline in the size of the labour force as a result of rising negative net migration in response to lower final demand.
- Possible decline in the labour supply as a result of the various measures introduced to mitigate the spread of COVID-19, and the expected decline in net migration flows as a result of the anticipated drop in economic activity coupled with the high uncertainty surrounding the period of time that the effects of COVID-19 will persist at a global level.
- Possible lower levels of productivity as a result of the various measures introduced to mitigate the spread of COVID-19.
- Lower levels of capital stock and capital productivity as a result of a decline in both private and public sector investment. Private investment is likely to decline in response to the increased level of uncertainty, whilst public sector investment, may decline, as a result of likely deterioration of the governments' fiscal stance as a result of the impact and the respective response, to the COVID-19 pandemic.

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<sup>28</sup> It should be noted that the generation of potential output growth estimates is a key component required for the analysis of the output gap, which provides an indication of the degree of overheating or slack, relative to the economy's growth potential.



- Disruptions to firms' supply chains thus lowering productive capacity or leading to a rise in the cost of production.

The materialisation of these supply side shocks would insignificantly increase the likelihood of the Maltese economy facing a decline in both its potential output level and the rate of growth of its potential output. This would imply that the economy could experience a decline in its underlying capacity to support an economic expansion (and the respective economic recovery) as well as potentially leading to an increased likelihood of inflationary pressures being generated in response to the eventuality of positive demand side shocks over the medium term. To this end, this section of the report puts forward a scenario-based analysis of the possible impact that COVID--19 may have on the trajectory of potential output and potential output growth over 2020-2023 for the Maltese economy. In order to achieve this goal, a baseline forecast for potential output growth which was estimated prior to the materialisation of the COVID-19 pandemic, over 2020-2023, will be compared to a set of scenario-based trajectories for potential output estimates, which do incorporate the assumed impact that the pandemic will have on the supply side of the economy. The difference between the baseline trajectory and scenario-based estimates generated should capture the implicit impact on the supply side of the economy caused by the COVID-19 pandemic, over the medium term.

### **2.2.1 Assessing impact of Covid-19 on the Maltese Economy in the Medium Term**

The chosen baseline trajectory for potential output growth over 2020-2023 is based, in large part, on the estimation exercise undertaken by the Ministry for Finance and Financial Services (MFIN) in the preparation for the Draft Budgetary Plan for 2020, which was submitted to the European Commission on 15 October 2019, hence in advance of emergence of the COVID-19 pandemic. Given that there are numerous methodologies<sup>29</sup> that can be applied for the estimation of potential output, in order for the estimation of the loss in terms of potential output growth (and levels) to be of significance, it was necessary that the scenario-based trajectories for potential output, which do incorporate the assumed effects of the pandemic on the supply side of the

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<sup>29</sup> For an overview of alternate methodologies pertaining to the estimation of potential output please refer to Cerra, Valerie and Saxena, Sweta Chaman, *Alternative Methods of Estimating Potential Output and Output Gap: An Application to Sweden* (March 2000). IMF Working Paper No. 00/59.

economy, followed the same methodology as that applied by the MFIN. The methodology applied by the MFIN is the EU Commission potential output and output gap methodology<sup>30</sup> which is a methodology applied by all EU member states within the context of the fiscal surveillance process of the Stability and Growth Pact (COM, 2014) and is widely recognised as a state of the art methodology. There are however a number of important limitations which should be recognised in relation to its application and thus a degree of caution is warranted in using such estimates for policy purposes. COM (2014) notes that a limitation of this framework is that there is a key element of uncertainty surrounding the estimation of potential output growth given that such estimates are indeed not directly observable. Furthermore, as is discussed in Grech and Micallef (2015), estimating potential output has always been a challenge to policy makers, especially in economies facing the aftermath of significant medium to long terms supply side shocks. Notwithstanding these limitations and considerations, the COM (2014) however notes that, whilst mindful of the frameworks underlying uncertainties, the potential growth and output gap forecasts produced, by the ECOFIN Council approved production function methodology, have been providing essential information to policy makers since their initial release in 2002. A brief summary of the EU Commission potential output and output gap methodology is provided in **box 2.2**.

**Box 2.2 Summary of EU Commission potential output and output gap potential output and output gap methodology<sup>31,32</sup>**

Potential output growth constitutes a summary indicator of the economy's capacity to generate sustainable, non-inflationary, growth whilst the output gap is an indication of the degree of overheating or slack relative to this growth potential. The measurement of potential output plays a crucial role as an operational surveillance tool for assessing the cyclical position of the economy and its productive capacity, which is an essential ingredient in the fiscal surveillance process. Estimating the output gap is difficult since potential output growth is not directly observable whilst

<sup>30</sup> It should be noted that the application of this methodology for the purpose of this report was possible thanks to the assistance of Mr. Wayne Apap, Senior Economics Officer at the Economic Policy Department (EPD) within the Ministry for Finance and Financial Services (MFIN).

<sup>31</sup> Prepared Mr Wayne Apap, Senior Economics Officer, at the Economic Policy Department (EPD) at the Ministry for Finance and Financial Services under the editorial supervision of Dr Ian P. Cassar.

<sup>32</sup> Further information on the European Commission's commonly agreed method to estimate potential output and the output gap can be found in the Commission's Economic Paper 535 titled 'The Production Function Methodology for Calculating Potential Growth Rates & Output Gaps', published in 2014.

[https://ec.europa.eu/economy\\_finance/publications/economic\\_paper/2014/pdf/ecp535\\_en.pdf](https://ec.europa.eu/economy_finance/publications/economic_paper/2014/pdf/ecp535_en.pdf)

actual GDP is subject to significant historical/forecast revisions. Being unobservable, the measurement of potential output and the output gap is a controversial topic and no consensus exists in the economic literature on the appropriate methodology to be used for this purpose. Indeed, potential output can only be derived from either a purely statistical approach or from a full econometric analysis.

Currently the European commission employs an economic approach to estimate potential output that consists of a production function methodology for all Member States. This approach focuses on the supply potential of an economy. The preference for an economic, as opposed to a statistical approach, on the part of European commission was driven by a number of considerations. One major advantage of using an economic estimation method is that is capable of giving a direct link to economic theory and assumptions are based on economic theory. In addition, the economic approach tries to overcome a number of serious statistical problems associated with the availability of only short time-series for several Member States.

With a production function approach, potential output can be represented by a combination of factor inputs - labour and capital - multiplied with the technological level or total factor productivity (TFP). Specifically, output ( $Y$ ) is underpinned by a combination of factor inputs – labour ( $L$ ) and the capital stock ( $K$ ), corrected for the degree of respective excess capacity ( $U_L$ ,  $U_K$ ) and adjusted for the level of respective efficiency ( $E_L$ ,  $E_K$ ). Given that the Commission's commonly agreed methodology assumes a Cobb-Douglas production function specification with constant returns to scale, potential output can be characterised as follows:

$$Y = (U_L L E_L)^\alpha (U_K K E_K)^{1-\alpha}$$

$$Y = (TFP)(L)^\alpha (K)^{1-\alpha}$$

where total factor productivity ( $TFP$ ), is set equal to:

$$TFP = (E_L^\alpha E_K^{1-\alpha})(U_L^\alpha U_K^{1-\alpha})$$

With this specification, it is necessary to estimate the trend components of the individual production factors, except capital (the capital stock is not de-trended). Therefore, estimating potential output amounts to removing the cyclical component from both labour and TFP.

### **Labour**

The measure employed for labour input is defined in terms of hours. Potential employment is a function of the population of working age (*POPW*), trend participation rate (*PARTS*), the non-accelerating inflation rate of unemployment (*NAWRU*) and the average annual hours worked per person employed (*HOURLST*):

$$L_t^P = POPW_t * PARTS_t * (1 - NAWRU_t) * HOURLST_t$$

### **Capital**

The capital accumulation is determined by the investment to potential output ratio (*iypot*):

$$I_t = iypot_t * YPOT_t$$

In terms of the measurement of the capital stock, the perpetual inventory method is used which accumulates annually all investments, whilst discounting a fraction of the existing stock via an annual depreciation rate.

$$K_t = I_t + (1 - dep)K_{t-1}$$

### **TFP**

Within the production function framework, potential output refers to the level of output which can be produced with a 'normal' level of efficiency of factor inputs, with this trend efficiency level being measured using a bivariate Kalman filter model which exploits the link between the TFP cycle and the degree of capacity utilization.

$$TFP = (E_L^\alpha E_K^{1-\alpha})(U_L^\alpha U_K^{1-\alpha})$$

### **Estimation of Malta's potential output and the output gap**

Malta's potential output growth along with the estimates presented within this document, are estimated by employing the commonly agreed production function methodology that is used by the European Commission in estimating potential output. The only minor adjustment involves the utilization of a differential forecast for the exogenous variables required as an input by the framework.

The application of the EU Commission's potential output and output gap methodology requires the input of several exogenous variables, namely, real GDP growth, real investment growth, employment growth, the unemployment rate, the rate of wage inflation, and the growth in average hours worked. It was therefore necessary to specify an estimate for each of these variables, across the entire time horizon for each scenario in order to capture the possible range of implications that the COVID-19 pandemic could have on the supply side of the economy. A similar approach to section 2.1 was adopted and three scenarios were employed, a mild, a medium and a severe scenario. Once again, utilising three scenarios was considered adequate given the unprecedented high levels of uncertainty surrounding these macroeconomic variables over the forecast horizon. The assumed estimates employed for the modelling framework's exogenous variables, over each time horizon, are provided in [appendix 2.9](#). It should be noted that the figures for real GDP growth in 2020 over the three scenarios were obtained from the scenario based short term analysis put forward in section 2.1. The estimates for real GDP growth over the remainder of the forecast horizon, as well as for all for the other variables over the entire forecast horizon are consistent with the scenario developments described in [box 2.1](#) and are based solely on the expert judgement of the authors of this report which take into account all available published statistical data and policy related information up till the cut of date for the scenario analysis presented in this chapter of the report, which was set for 14 August 2020. The assumed trajectory for real GDP, in level terms, employed for all three scenarios is illustrated in [chart 2.8](#).

- **Mild Scenario**

This scenario assumes the actualisation of the factors underpinning scenario 1, which were discussed in **box 2.1**, as well as the respective contraction in real GDP of 8.6% over 2020. Underpinning this scenario is the expectation that the Maltese economy will manage to recover fully from the COVID-19 pandemic in the year 2022. This scenario implicitly assumes that the real GDP level, the real investment level, average hours work, the employment level and the unemployment rate, all return to their respective actualised levels for 2019, in 2022. In 2023, the economy is assumed to return to the average economic growth path prior COVID-19 and actualise a real GDP growth rate of 7.0%<sup>33</sup>. Investment is assumed to accelerate significantly in 2023, as uncertainty is anticipated to decline in the face of a more stable global economy, a sizeable pick up in tourism demand, coupled also with a higher level of domestic demand. The trajectory for wage inflation over the entire forecast horizon is assumed to be consistent with the anticipated developments within the other exogenous variables and the underlying scenario.

- **Medium Scenario**

This scenario assumes the actualisation of the factors underpinning scenario 2 discussed in **box 2.1**, as well as the corresponding contraction in real GDP of 11.7% over 2020. Underpinning this scenario is the expectation that the Maltese economy recovers fully from the COVID-19 pandemic in the year 2023. This scenario therefore assumes that the real GDP level, the real investment level, average hours work, the employment level and the unemployment rate, all return to their respective actualised levels for 2019 in the year 2023. The trajectory for wage inflation over the entire forecast horizon is assumed to be consistent with the anticipated developments within the other exogenous variables and the underlying scenario.

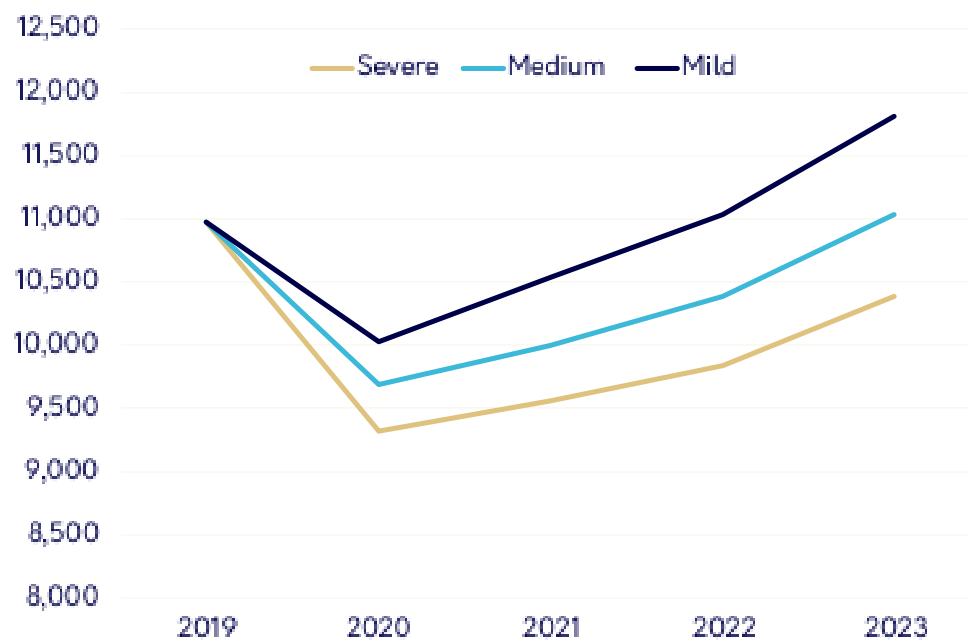
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<sup>33</sup> The average real GDP growth for the Maltese economy between 2013 and 2019 amounts to approximately 7.0%.

- **Severe Scenario**

This scenario assumes the materialisation of the factors described in scenario 3, presented in **box 2.1**, as well as the corresponding contraction in real GDP over 2020 of 15.1%. Underpinning this scenario is the expectation that the Maltese economy would not have completely recovered from the COVID-19 pandemic over the entire medium-term horizon. This scenario therefore assumes that the real GDP level, the real investment level, average hours worked, the employment level and the unemployment rate, do not return to their respective actualised levels generated for 2019 by 2023. The trajectory for wage inflation over the entire forecast horizon is assumed to be consistent with the anticipated developments within the other exogenous variables and the underlying scenario.

**Chart 2.9 Assumed trajectory of Real GDP between 2020 and 2023 on the basis of the three scenarios (in million euro)**



Source: Authors

## 2.2.2 Results and discussion

Following the identification of the required exogenous variables, presented in [appendix 2.9](#), it was subsequently possible to apply the EU Commission potential output and output gap methodology for each of the three respective scenarios. As described in the previous subsection, this would allow for the estimation of the growth rate (and level) of potential output between 2020 and 2023 associated to each scenario. Once this process was undertaken, it was possible to estimate the decline in the level of potential output and potential output growth associated to the impact of COVID-19 on the supply side of the economy in the medium term utilising as a baseline the corresponding estimates generated by the MFIN prior to the event of the COVID-19 pandemic. It is important to note that the comparative analysis presented in this section crucially depends on the underlying assumptions employed for each scenario. This analysis should be therefore evaluated with a degree of caution especially given the unprecedented uncertainty surrounding the developments and economic impact of the COVID-19 pandemic and the fact that the potential output estimates generated by the methodology employed are subject to significant volatility.

### 2.2.2.1 Impact on the level of potential output in the medium term

In comparison with the baseline level of potential output, the scenario-based levels of potential output are estimated to all be notably lower, over the entire medium-term horizon. As is observable from [chart 2.9](#), on the basis of the mild scenario, potential output is expected to be 5.5% lower in 2020 compared to the baseline scenario. Over the medium-term this discrepancy is expected to increase steadily such that in 2023 potential output is estimated to be 9.9% lower than the baseline level of potential output. The resulting estimates for the medium and severe scenarios indicate that this discrepancy would increase to 8.1% and 10.6% respectively, for 2020. Analysing the accumulated discrepancy in the generation of potential output over the time horizon, estimated for the severe scenario, indicates that the level of potential output in 2023 could potentially be 20% lower than the baseline. Although the resulting decline in potential output levels, relative to the baseline, varies depending on the respective scenario<sup>34</sup>, from the analysis undertaken it is clear that the impact over time of the

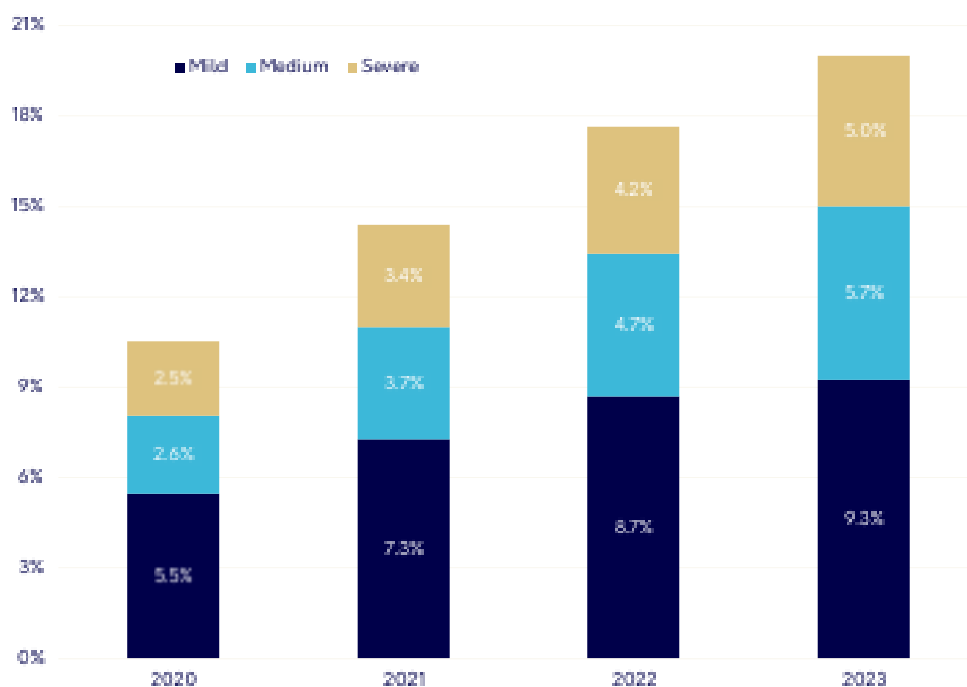
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<sup>34</sup> The full set of results are presented in appendix 2.10.



pandemic on the supply side of the economy, would nonetheless result in a permanent effect on the economy's productive capacity in the medium term. Even on the basis of the mild scenario, which assumes that the economy will recover from the COVID--19 pandemic in 2022, the level of potential output in 2023 is nonetheless 9.3% lower than the baseline.

**Chart 2.10 Decline in the level of potential output compared to pre Covid-19 MFIN estimates (as a % of MFIN estimates)**



Source: Authors, MFIN

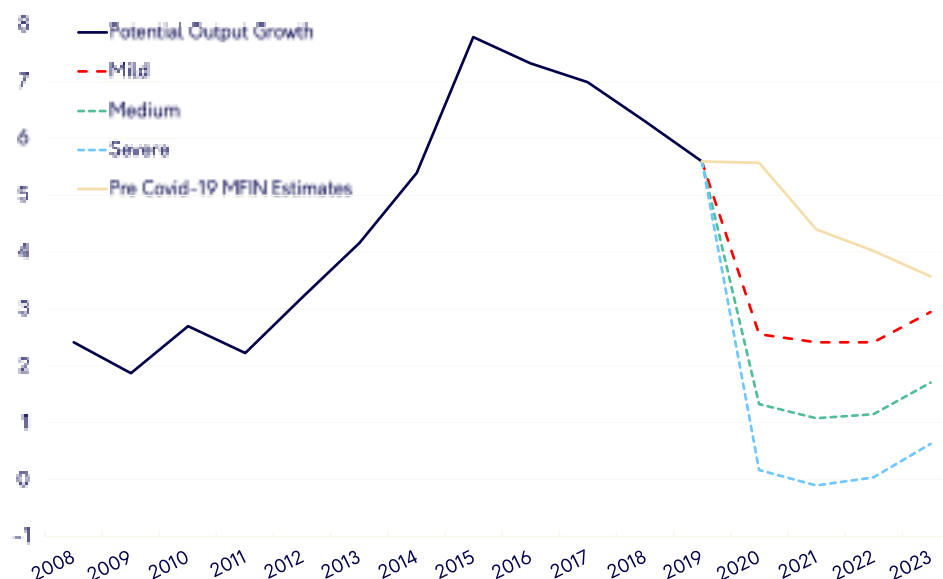
#### 2.2.2.2 Impact on potential output growth in the medium term

As previously explained, potential output growth constitutes a summary indicator of the economy's capacity to generate sustainable non-inflationary growth. The growth rate in potential output is conventionally the starting point for thinking about how fast an economy can grow over the medium term. A decline in potential output growth in the medium terms implies that the economy's capacity to generate GDP growth, at least without causing unintended inflationary pressures in factor markets, will also decline.

**Chart 2.10** illustrates the trajectory for potential output growth over the medium term

(2020-2023) for all three scenarios, as well as for the baseline trajectory. The resulting estimates are presented in [appendix 2.10](#).

**Chart 2.10 Potential output growth trajectory (%)**



Source: Authors, MFN.

As expected, the rate of growth in potential output over 2020 is estimated to decline, by varying degrees, across all three scenarios relative to the baseline growth rate in potential output of 5.6%. The baseline scenario estimates a gradual tapering off from potential output growth over the medium term from the 5.6% in 2020, to roughly 3.6% over 2023. In the mild scenario, potential output in 2020 is estimated to expand by 2.6%, and to thereafter decelerate by 0.2 percentage points over 2021 and remain stable at the 2.4% mark even in 2022, prior to expanding by 2.9% in 2023. In the medium scenario, potential output growth in 2020 is estimated to expand by 1.3% and to thereafter decelerate marginally over 2021 and 2022, prior to subsequently expand by 1.7% in 2023. Estimates for the medium scenario therefore imply that potential output growth over the entire time horizon will be below the rate of potential output growth estimated for 2009, at 1.9%, which is the last year in which the Maltese economy experienced an economic contraction. In relation to the severe scenario, it is estimated that in 2020 potential output will expand by a marginal 0.2% and that it would remain relatively stagnant over 2021 and 2022, prior to expanding by solely 0.6% in

2023. It should be noted that even in the scenarios in which the economy is assumed to recover from the COVID-19 pandemic in the medium term, the mild scenario (in 2022) and the medium scenario (in 2023) the trajectory of potential output growth has been permanently altered as a result of the assumed impact of COVID-19 on the supply side of the economy. The mild scenario does however suggest a degree of convergence relative to the baseline which would occur the year after the economy is assumed to have recovered.

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## Appendix 2.1 Compilation process of the SIOT for 2014

The resulting SIOT for the reference year of 2014 utilised for this study was derived by applying the input-output RAS matrix updating methodology (Miller and Blair, 2009) to the SIOT for 2010 published by the NSO. This updating procedure was undertaken utilizing PYIO which is a dedicated software for the application of such methodologies (Nazara et. al., 2003). Updating techniques are widely utilised in input-output analysis to overcome the expensive cost of producing new tables from surveys and other methods. Updating an input-output table can be done using either non-survey or partial-survey methods. The chosen technique, known as the bi-proportional or RAS method is a partial survey technique and it is commonly utilised for updating national SIOTs (Miller and Blair, 2009). This method finds a new input coefficient matrix  $A$ , for period  $t$  given the prior  $A$  matrix in period 0 and some additional information for period  $t$ . The period  $t$  information needed are the sectoral allocation of intermediate output, sectoral allocation of intermediate input and sectoral output. It should be noted at this point that these inputs formulated together with input from the experts at the National Accounts Unit at National Statistics Office of Malta for the reference year of 2014. Given that an SIOT for the reference year of 2015 was scheduled to be published by the NSO by the end of 2020 it was decided that the SIOT to be constructed for the purpose of this study was going to be for the reference year of 2014. Once the required additional information for time  $t$  was identified the general structure of the RAS methodology<sup>35</sup> was applied as follows:

$$A^{2n} = [R^n \dots R^1]A(0)[S^1 \dots S^n]$$

where  $A(0)$  is the prior matrix to be adjusted using a series of adjustment coefficients represented in  $[R^n \dots R^1]$  and  $[S^1 \dots S^n]$ . The computation method itself involves series of iterations up to the point where the absolute difference between the row (and column) sums of transaction (the  $AX$  matrix) matrix and the values of the vectors representing the sectoral allocation of intermediate output and sectoral allocation of intermediate input are less than 0.001. This convergence criterion is generally assumed to suffice for any reasonable application of the RAS method (Nazara et.al., 2003). It should be noted that PYIO allows for the updating of both the technical coefficients matrix (the  $A$  matrix) and the intermediate consumption matrix in monetary values.

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<sup>35</sup> Refer to Miller and Blair (2009) for a more detailed exposition of this technique.

## Appendix 2.2 The Leontief demand driven model

The recorded transfer payments within an SIOT portray a set of systematic relations which may then be represented as a large set of linear equations. Each of these linear equations ultimately illustrates the distribution of each industry's output throughout the whole of the economy. Given the underlying structure of a SIOT a set of general input output equations can be formulated which reflect the condition of equilibrium between total demand and total supply for each industry such that:

$$x_i = \sum_{j=1}^n x_{ij} + f_i \quad i, j = 1, \dots, n.$$

Where total production  $x_i$  for each sector  $i$  may be expressed as a function of  $x_{ij}$  which denotes the value of sales from sector  $i$  to sector  $j$  and  $f_i$  which denotes the amount of sales from sector  $i$  to final demand.

Once the SIOT has been defined as a set of input output equations it is possible to derive what are known as input (or technical) coefficients which form the core of the Leontief Demand Driven model and represent actual flows of products to and from the numerous industries.

The open Leontief demand driven model applied within this study follows the methodology presented within Miller and Blair (2009) as well employed in Cassar and Rapa (2018). At the core of the Leontief demand driven model is the concept of technical coefficients denoted by ' $a_{ij}$ '.

$$a_{ij} = z_{ij} / x_j \quad i, j = 1, \dots, n$$

Technical coefficients may thus be derived from the ratio of the inputs produced by sector  $i$  purchased by industry  $j$ ,  $z_{ij}$ , to the total input used by sector  $j$ ,  $x_j$ . Technical coefficients show, for each industry in the economy, the proportional value of inputs purchased from all sectors in the economy (including itself) per monetary unit of output. On the basis of this definition of what technical coefficients represent within the input-output system we can now derive, utilizing matrix algebra notation, a matrix of technical coefficients as follows:

$$A = Z \hat{x}^{-1}$$

Where  $Z$  denotes an  $(n \times n)$  matrix of inter-industry flows (obtained from the domestic intermediate consumption matrix),  $x$  denotes an  $(n \times 1)$  column vector of output such that  $\hat{x}^{-1}$  represents the inverse of the diagonal matrix obtained from vector  $x$ , and  $A$

represents the matrix of technical coefficients. Each column of the matrix of technical coefficients,  $A$ , also known as the direct input coefficient matrix. The technical coefficients matrix is viewed as a means with which to analyse the direct inter-industry linkages that tie the economy together since it shows for each individual sector the direct effects on output in terms of the additional demand for input requirements that is generated by an increase in the value of output by one monetary unit.

The solution to the Leontief demand driven model<sup>36</sup> may be obtained by applying the following equation expressed in matrix algebra notation:

$$x = (I - A)^{-1} f = L f$$

The solution to the input-output system implies that, for a given Leontief Inverse the amount of total output  $x$  produced in the economy is determined solely by the structure of final demand,  $f$ , where  $f$  is a column vector ( $n \times 1$ ) of total final demand absorbed by each of the  $n$  sectors in the economy. Within input-output literature the inverse of the matrix  $(I - A)$ , the technology matrix, is referred to as the Leontief inverse matrix (or multiplier matrix) and it is this matrix which incorporates the interindustry linkages in terms of the direct and indirect effects on production across all sectors.

$$L = (I - A)^{-1}$$

The elements within Leontief inverse matrix incorporate the notion that increases in final demand have a larger impact on the production of output than solely the initial additional output produced (direct production effects) required to supply the exogenous increase in final demand. The Leontief inverse thus incorporates the concept that the production process required to produce a unit of output for use by final demand, also requires the production of output by other industries for use as intermediate inputs. Furthermore, the production of these additional intermediate inputs requires subsequent increased rounds of production since output has to be produced to satisfy the second round of input requirements. All these rounds of additional increases in output are referred to as the indirect production effects of an exogenous increase in final demand on total output production. (Miller and Blair, 2009) Similarly, an assumed

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<sup>36</sup> The model employed is referred to as the Open Leontief demand driven model (Miller and Blair, 2009). It was decided not to employ the closed Leontief demand driven model given that it is clear that the Covid-19 pandemic will alter income-expenditure patterns in 2020. This implies that utilizing the closed Leontief demand driven model would have resulted in employing the rather implausible assumption that these patterns have remained constant since the reference year of the SIOT.

decline in the final demand for a particular would lead to a fall in output which via the balance equation of the demand driven model would capture both the resulting fall in output as a result of the direct and indirect effects on production.

$$\Delta x = (I - A)^{-1} \Delta f$$

Through the application of the balance equation of the Leontief demand driven model and substituting the original column vector of final demand with a column vector of final demand which incorporates the specific assumed scenario it is therefore possible to undertake a sectoral specific scenario analysis and generate an estimate of the amount of output, from all industries, required to sustain any specific level of final demand, in one or indeed all industries.

The results obtained from this model should be evaluated within the context of the several noteworthy assumptions and limitations inherent in the application of the Leontief demand driven model which are discussed in detail within Miller and Blair (2009) and Leontief (1986).

### Appendix 2.3 Detailed description of SIOT 2014 sectoral classification

NACE Rev.2	Industry
A01	Crop and animal production, hunting and related service activities
A02	Forestry and logging
A03	Fishing and aquaculture
C10-12	Manufacture of food products, beverages and tobacco products
C13-15	Manufacture of textiles, wearing apparel and leather products
C16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
C17-22	Manufacture of paper and paper products, printing and reproduction of recorded media, manufacture of coke and refined petroleum products, chemical products, basic pharmaceutical products and pharmaceutical preparations and rubber and plastic products
C23	Manufacture of other non-metallic mineral products
C24	Manufacture of basic metals

C25	Manufacture of fabricated metal products, except machinery and equipment
C26-32	Manufacture of computer, electronic and optical products, electrical equipment, machinery and equipment, motor vehicles, trailers and semi-trailers, Other transport equipment and of furniture; other manufacturing
C33	Repair and installation of machinery and equipment
D35-E39	Electricity, gas, steam and air conditioning supply, water collection, treatment and supply, sewerage; waste collection, treatment and disposal activities; materials recovery; remediation activities and other waste management services
B+F	Mining and quarrying and construction
G45	Wholesale and retail trade and repair of motor vehicles and motorcycles
G46	Wholesale trade, except of motor vehicles and motorcycles
G47	Retail trade, except of motor vehicles and motorcycles
H49-53	Land transport and transport via pipelines, water transport, air transport, warehousing and support activities for transportation and postal and courier activities
I	Accommodation and food service activities
J58-63	Publishing activities, motion picture, video and television programme production, sound recording and music publishing activities; programming and broadcasting activities, Telecommunications, computer programming, consultancy and related activities; and information service activities
K64	Financial service activities, except insurance and pension funding
K65	Insurance, reinsurance and pension funding, except compulsory social security
K66	Activities auxiliary to financial services and insurance activities
L68	Real estate activities
M69-70	Legal and accounting activities; activities of head offices; management consultancy activities
M71-72	Architectural and engineering activities; technical testing and analysis



M73	Advertising and Market Research
M74-75	Other professional, scientific and technical activities; veterinary activities
N77	Rental and leasing activities
N78	Employment activities
N79	Travel agency, tour operator reservation service and related activities
N80-82	Security and Other Administrative activities
O	Public administration and defence; compulsory social security
P	Education
Q86	Human health activities
Q87-88	Social work activities
R90-92	Creative, arts and entertainment activities; libraries, archives, museums and other cultural activities; gambling and betting activities
R93	Sports activities and amusement and recreation activities
S94	Activities of membership organisations
S95	Repair of computers and personal and household goods
S96	Other personal service activities
T, U	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use and of extra-territorial organisations and bodies

## Appendix 2.4 Questionnaire

### Questionnaire on behalf of the National Productivity Board

The NPB is in the process of preparing its second Annual Report which will be published later in September this year. A small group of researchers, namely, Dr Philip von Brockdorff, Dr Ian P. Cassar and Dr Stephanie Fabri have been tasked with the preparation of this Report. In order to be able to establish a number of medium- to long- term economic proposals, one of the tasks involves the quantification of the economic impact of the current Covid-19 Pandemic in terms of the specific sectoral effects and respective ripple effects across all sectors of economy as a response to this economic shock.

To this end, it would be highly appreciated if you could fill in the following questionnaire. Your organisation will be asked to provide estimates of the anticipated decline in demand that specific sectors may face over 2020 on the basis of three specific economic scenarios. Kindly note that each institution is only expected to provide such estimates for those sectors which are within the areas of competence and expertise of the respective organisation.

The cooperation of your organisation in providing the required information is critical for the compilation of the report and hence you are kindly urged to spend the necessary time to provide as realistic feedback as possible.

If you would like the information you provide to remain confidential kindly indicate this by ticking the respective box at the beginning of the questionnaire. Should you have any queries in relation to this questionnaire kindly contact Dr Ian P. Cassar on [ian.p.cassar@um.edu.mt](mailto:ian.p.cassar@um.edu.mt).

## Scenarios

Criteria	Scenario 1	Scenario 2	Scenario 3
Contraction in Consumer Demand	10%	20%	30%
Health Considerations	Risk of illness and spread is very low and fully contained with the vaccine available in fourth quarter of 2020.	Risk of illness and spread is low to moderate (partially contained). Information is made public that vaccine would be available at end of first quarter 2021.	Risk of a second wave and spread is higher as of June 2020 than registered so far. Information is made public that the vaccine would only be available in mid-2021.
Tourism	Limited travel in safe corridors as of early July 2020. Open for all destinations with minimal restrictions as of September 2020. Airport has been reopened but some restrictions still remain which make travel an inconvenience. Stabilization of tourism activity is expected to take 18 months.	Despite airport opening in early July restrictions make traveling within safe corridor destinations difficult for the next 24 months.	Open in early July (as in scenario 1) but a number of key strategic airports to remain inaccessible until end 2020. Stabilization of tourism activity post Covid-19 is expected to take 24 months.
Global Trade Decline in 2020	10%	20%	30%

## Questionnaire

Name of Organisation: \_\_\_\_\_

Name of Representative: \_\_\_\_\_

Do you provide consent to the authors of the report to reference having been in contact with your organisation as part of the consultation process to generate the respective sectoral impact scenarios? (Mark with an X)

Yes ☐ No ☐

Do you provide consent to the authors of the report to publish the specific estimates your organisation has provided in this questionnaire? (Mark with an X)

Yes ☐ No ☐

Do you provide consent to the authors of the report to publish the specific estimates your organization has provided in this questionnaire, clearly identifying your organisation as the source? (Mark with an X)

Yes ☐ No ☐

For each of the three scenarios described, kindly indicate the direct loss in final demand i.e aggregated loss in sales as a result of the anticipated fall in household consumption, investment, Government spending, tourism and exports of goods and services, in percentage terms, (e.g. 10% = 10% lower compared to 2019), that your organisation anticipates will occur in each of the following sectors. Should your organisation not be in a position to provide an estimate for the specific sector, please leave blank or insert N/A.

Specific Economic Activity	Scenario		
	1	2	3
Crop and animal production			
Fishing and aquaculture			
Manufacture of food products, beverages and tobacco products			
Manufacture of chemical products, basic pharmaceutical products and pharmaceutical, paper and paper products, printing and reproduction of recorded media, preparations and rubber and plastic products manufacture			
Manufacture of computer, electronic and optical products, electrical equipment, machinery and equipment n.e.c.			
Construction, mining and quarrying			
Real estate activities			
Wholesale and retail trade and repair of motor vehicles and motorcycles			
Wholesale trade, except of motor vehicles and motorcycles			
Retail trade, except of motor vehicles and motorcycles			
Air transport, land transport and transport via pipelines, water transport, warehousing and support activities for transportation and postal and courier activities			
Accommodation and food service activities			
Rental and leasing activities			
Travel agency, tour operator reservation service and related activities			
Sports activities and amusement and recreation activities			
English language schools			
I-gaming, and other gambling and betting activities			
Financial service activities, except insurance and pension funding			
Insurance, reinsurance and pension funding,			
Legal and accounting activities; activities of head offices; management consultancy			
Architectural and engineering activities; technical testing and analysis			
Advertising and research, other professional, scientific and technical activities			

**Appendix 2.5 Scenario based impact on sectoral final demand (decline in percentage terms) based on questionnaire feedback.**

NACE REV. 2	Industry	Scenario 1	Scenario 2	Scenario 3
		% Loss in final demand	% Loss in final demand	% Loss in final demand
A01-02	Crop and animal production	-6	-9	-13
A03	Fishing and aquaculture	-8	-11	-17
C10-12	Manufacture of food products, beverages ...	-4	-7	-13
C17-22	Manufacture of chemical products, basic pharmaceutical products...	-3	-5	-7
C26-32	Manufacture of computer, electronic and optical products, electrical equipment...	-4	-7	-12
B+F	Construction, mining and quarrying	-1	-2	-4
L68	Real estate activities	-9	-12	-16
G45	Wholesale and retail trade and repair of motor vehicles and motorcycles	-22	-27	-33
G46	Wholesale trade, except of motor vehicles and motorcycles	-20	-25	-30
G47	Retail trade, except of motor vehicles and motorcycles	-23	-30	-36
H49-53	Air transport, land transport and transport via pipelines, water transport, ...	-22	-30	-37
I	Accommodation and food service activities	-33	-44	-54
N77	Rental and leasing activities	-22	-30	-38
N79	Travel agency, tour operator reservation service and related activities	-46	-57	-67
R93	Sports activities and amusement and recreation activities	-24	-33	-49
P	Education activities *	-3	-4	-5
R90-92	Creative, arts and entertainment activities; gambling and betting activities, ...	-1	-3	-4
K64	Financial service activities, except insurance and pension funding	-4	-6	-8
K65	Insurance, reinsurance and pension funding,	-5	-7	-9
M69-70	Legal and accounting activities; activities of head offices; management consultancy	-3	-6	-8
M71-72	Architectural and engineering activities; technical testing and analysis	-6	-9	-12
M73	Advertising and Market Research	-12	-17	-21
M74-75	Other professional, scientific and technical activities; veterinary activities	-12	-17	-21

\* It should be noted that the questionnaire enquired about the impact on English Language Schools (ELS). The resulting impact was estimated as follows: -50% for Scenario 1, - 61% for Scenario 2 and -67% for Scenario 3. However, on the basis of shares of ELS activities ,within the context of the total P, Education activities sector , these percentages were converted into the impact on entire P sector which are thus presented in this table.

**Appendix 2.6 Scenario based impact analysis on output production (Million Euro).**

NACE code	Industry	Scenario 1		Scenario 2		Scenario 3	
		Million Euro	Rank	Million Euro	Rank	Million Euro	Rank
A01	Crop and animal production, hunting ...	20.8	21	28.6	22	38.0	21
A02	Forestry and logging	0.0	41	0.0	41	0.0	41
A03	Fishing and aquaculture	20.0	23	26.7	24	40.1	20
C10-12	Manufacture of food products, beverages ...	67.0	12	93.3	12	128.4	12
C13_15	Manufacture of textiles, wearing apparel ...	0.6	37	0.8	37	1.0	37
C16	Manufacture of wood and of products ...	1.0	36	1.4	36	1.9	35
C17-22	Manufacture of paper and paper products, ...	28.7	18	44.8	17	62.3	17
C23	Manufacture of other non-metallic mineral ...	7.5	30	10.9	30	14.7	30
C24	Manufacture of basic metals	0.1	40	0.2	40	0.3	40
C25	Manufacture of fabricated metal products, ...	7.0	31	10.1	31	13.7	31
C26-32	Manufacture of computer, electronic ...	49.6	15	79.7	15	136.0	9
C33	Repair and installation of machinery ...	9.9	28	13.7	29	17.5	29
D35-E39	Electricity, gas, steam and air conditioning ...	76.9	10	103.8	10	132.4	10
B+F	Mining and quarrying and construction	78.3	9	119.3	8	162.2	8
G45	Wholesale and retail trade and repair ...	32.5	16	41.1	18	50.9	19
G46	Wholesale trade, except of motor vehicles ...	135.3	6	177.8	7	223.9	7
G47	Retail trade, except of motor vehicles ...	179.2	4	233.8	4	285.4	5
H49-53	Land transport and transport via pipelines, ...	418.8	2	584.7	2	720.6	2
I	Accommodation and food service activities	447.6	1	585.6	1	723.0	1
J58-63	Publishing activities, motion picture, video ...	29.4	17	47.9	16	66.4	16
K64	Financial service activities, except insurance ...	241.8	3	352.1	3	462.8	3
K65	Insurance, reinsurance and pension funding ...	15.1	25	21.2	25	28.7	25
K66	Activities auxiliary to financial services ...	9.5	29	13.8	28	18.2	28
L68	Real estate activities	174.2	5	232.9	5	311.0	4
M69-70	Legal and accounting activities; ...	54.6	14	82.1	14	106.4	15
M71-72	Architectural and engineering activities; ...	20.0	22	28.8	21	37.4	22
M73	Advertising and Market Research	62.7	13	86.3	13	108.8	14
M74-75	Other professional, scientific and technical ...	12.5	27	17.6	27	22.5	27
N77	Rental and leasing activities	70.0	11	98.6	11	124.1	13
N78	Employment activities	14.4	26	19.9	26	25.3	26
N79	Travel agency, tour operator ...	89.4	7	112.1	9	130.7	11
N80-82	Security and investigation activities; ...	19.4	24	26.9	23	34.8	24
O	Public administration and defence ...	6.3	32	8.6	32	10.8	32
P	Education	26.0	19	32.1	20	36.1	23
Q86	Human health activities	0.2	39	0.3	39	0.4	39
Q87-88	Social work activities	0.2	38	0.3	38	0.4	38
R90-92	Creative, arts and entertainment activities; ...	85.9	8	180.9	6	275.9	6
R93	Sports activities and amusement ...	25.0	20	35.0	19	51.4	18
S94	Activities of membership organisations	1.0	35	1.4	35	1.8	36
S95	Repair of computers and personal ...	1.6	34	2.2	34	2.8	34
S96	Other personal service activities	3.6	33	4.8	33	5.9	33
T,U	Activities of households as employers; ...	0.0	41	0.0	41	0.0	41

**Appendix 2.7 Scenario based impact analysis on gross value added (Million Euro).**

NACE code	Industry	Scenario 1		Scenario 2		Scenario 3	
		Million Euro	Rank	Million Euro	Rank	Million Euro	Rank
A01	Crop and animal production, hunting ...	10.5	23	14.5	23	19.3	23
A02	Forestry and logging	0.0	41	0.0	41	0.0	41
A03	Fishing and aquaculture	2.7	30	3.6	30	5.5	30
C10-12	Manufacture of food products, beverages ...	22.4	8	31.1	10	42.9	11
C13_15	Manufacture of textiles, wearing apparel ...	0.2	37	0.3	37	0.4	37
C16	Manufacture of wood and of products ...	0.4	36	0.6	36	0.8	36
C17-22	Manufacture of paper and paper products, ...	10.9	21	17.0	21	23.6	20
C23	Manufacture of other non-metallic mineral ...	2.2	31	3.2	31	4.4	31
C24	Manufacture of basic metals	0.1	40	0.1	40	0.2	40
C25	Manufacture of fabricated metal products, ...	2.1	32	3.1	32	4.1	32
C26-32	Manufacture of computer, electronic ...	16.5	16	26.4	14	45.1	10
C33	Repair and installation of machinery ...	3.4	28	4.7	28	5.9	28
D35-E39	Electricity, gas, steam and air conditioning ...	15.4	17	20.8	17	26.6	17
B+F	Mining and quarrying and construction	22.3	9	34.0	9	46.2	9
G45	Wholesale and retail trade and repair ...	18.6	15	23.5	16	29.1	16
G46	Wholesale trade, except of motor vehicles ...	79.9	5	105.1	5	132.3	5
G47	Retail trade, except of motor vehicles ...	117.3	4	153.0	4	186.7	4
H49-53	Land transport and transport via pipelines, ...	131.3	2	183.3	2	225.9	2
I	Accommodation and food service activities	182.2	1	238.3	1	294.3	1
J58-63	Publishing activities, motion picture, video ...	11.0	20	18.0	18	25.0	19
K64	Financial service activities, except insurance ...	19.9	13	28.9	11	38.0	12
K65	Insurance, reinsurance and pension funding ...	5.2	25	7.3	25	9.9	25
K66	Activities auxiliary to financial services ...	2.9	29	4.3	29	5.6	29
L68	Real estate activities	123.8	3	165.5	3	221.1	3
M69-70	Legal and accounting activities; ...	32.2	7	48.4	7	62.7	8
M71-72	Architectural and engineering activities; ...	10.9	22	15.6	22	20.3	22
M73	Advertising and Market Research	19.0	14	26.2	15	33.0	13
M74-75	Other professional, scientific and technical ...	3.5	27	4.9	27	6.3	27
N77	Rental and leasing activities	47.4	6	66.8	6	84.1	6
N78	Employment activities	9.9	24	13.7	24	17.4	24
N79	Travel agency, tour operator ...	22.0	11	27.5	12	32.1	14
N80-82	Security and investigation activities; ...	12.8	18	17.7	19	22.9	21
O	Public administration and defence ...	3.7	26	5.0	26	6.4	26
P	Education	22.0	10	27.1	13	30.5	15
Q86	Human health activities	0.1	39	0.2	39	0.3	38
Q87-88	Social work activities	0.1	38	0.2	38	0.2	39
R90-92	Creative, arts and entertainment activities; ...	21.1	12	44.5	8	67.8	7
R93	Sports activities and amusement ...	12.2	19	17.0	20	25.0	18
S94	Activities of membership organisations	0.6	35	0.8	35	1.1	35
S95	Repair of computers and personal ...	0.6	34	0.9	34	1.1	34
S96	Other personal service activities	2.1	33	2.8	33	3.4	33
T,U	Activities of households as employers; ...	0.0	41	0.0	41	0.0	41



**Appendix 2.8 Scenario based impact analysis on each sector's own GVA generated (percentage terms of each sectors' own GVA).**

NACE code	Industry	Scenario 1		Scenario 2		Scenario 3	
		% Decline	Rank	% Decline	Rank	% Decline	Rank
A01	Crop and animal production, hunting ...	14.1%	10	19.4%	9	25.9%	10
A02	Forestry and logging	0.0%	41	0.0%	41	0.0%	41
A03	Fishing and aquaculture	8.8%	14	11.8%	14	17.7%	13
C10-12	Manufacture of food products, beverages ...	13.7%	12	19.1%	12	26.3%	9
C13_15	Manufacture of textiles, wearing apparel ...	1.5%	35	2.1%	37	2.7%	37
C16	Manufacture of wood and of products ...	6.9%	17	9.7%	17	13.1%	16
C17-22	Manufacture of paper and paper products, ...	5.2%	21	8.1%	21	11.3%	19
C23	Manufacture of other non-metallic mineral ...	3.9%	30	5.7%	29	7.6%	29
C24	Manufacture of basic metals	19.3%	7	28.4%	5	40.7%	4
C25	Manufacture of fabricated metal products, ...	4.4%	27	6.4%	27	8.7%	25
C26-32	Manufacture of computer, electronic ...	4.5%	26	7.3%	23	12.4%	18
C33	Repair and installation of machinery ...	4.0%	29	5.6%	30	7.1%	30
D35-E39	Electricity, gas, steam and air conditioning ...	7.6%	16	10.2%	16	13.1%	17
B+F	Mining and quarrying and construction	4.9%	23	7.5%	22	10.2%	23
G45	Wholesale and retail trade and repair ...	20.1%	6	25.5%	7	31.5%	7
G46	Wholesale trade, except of motor vehicles ...	14.7%	9	19.3%	11	24.3%	12
G47	Retail trade, except of motor vehicles ...	22.6%	4	29.5%	4	36.0%	6
H49-53	Land transport and transport via pipelines, ...	18.2%	8	25.4%	8	31.3%	8
I	Accommodation and food service activities	31.9%	2	41.7%	2	51.5%	2
J58-63	Publishing activities, motion picture, video ...	1.4%	36	2.3%	36	3.2%	36
K64	Financial service activities, except insurance ...	4.3%	28	6.3%	28	8.3%	28
K65	Insurance, reinsurance and pension funding ...	5.0%	22	6.9%	24	9.4%	24
K66	Activities auxiliary to financial services ...	3.0%	33	4.3%	32	5.7%	31
L68	Real estate activities	20.5%	5	27.4%	6	36.7%	5
M69-70	Legal and accounting activities; ...	5.5%	20	8.3%	20	10.8%	22
M71-72	Architectural and engineering activities; ...	8.1%	15	11.7%	15	15.1%	15
M73	Advertising and Market Research	9.8%	13	13.5%	13	17.0%	14
M74-75	Other professional, scientific and technical ...	6.1%	19	8.6%	18	11.0%	20
N77	Rental and leasing activities	13.8%	11	19.4%	10	24.4%	11
N78	Employment activities	6.2%	18	8.5%	19	10.8%	21
N79	Travel agency, tour operator ...	42.8%	1	53.6%	1	62.5%	1
N80-82	Security and investigation activities; ...	4.8%	25	6.6%	26	8.5%	26
O	Public administration and defence ...	0.6%	38	0.8%	38	1.0%	38
P	Education	3.5%	31	4.4%	31	4.9%	33
Q86	Human health activities	0.0%	40	0.0%	40	0.1%	40
Q87-88	Social work activities	0.1%	39	0.1%	39	0.1%	39
R90-92	Creative, arts and entertainment activities; ...	1.3%	37	2.8%	35	4.2%	34
R93	Sports activities and amusement ...	22.9%	3	32.1%	3	47.1%	3
S94	Activities of membership organisations	2.3%	34	3.2%	34	4.1%	35
S95	Repair of computers and personal ...	4.8%	24	6.7%	25	8.5%	27
S96	Other personal service activities	3.1%	32	4.1%	33	5.1%	32
T,U	Activities of households as employers; ...	0.0%	41	0.0%	41	0.0%	41

## Appendix 2.9 Assumptions employed for estimation of Potential output

Mild Scenario					
	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
<b>Real GDP</b>	4.4	-8.6	5.0	4.8	7.0
<b>Real Investment</b>	7.2	-9.0	8.5	7.0	15.0
<b>Employment</b>	5.7	-5.0	4.0	3.5	4.0
<b>Unemployment rate</b>	3.4	6.0	5.0	3.5	3.4
<b>wage inflation</b>	7.6	-2.0	6.0	5.0	6.0
<b>hours worked</b>	0.0	-11.5	7.0	5.6	0.0
Medium Scenario					
	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
<b>Real GDP</b>	4.4	-11.7	3.2	3.9	6.2
<b>Real Investment</b>	7.2	-13.0	7.0	6.5	12.0
<b>Employment</b>	5.7	-6.5	3.0	2.5	3.5
<b>Unemployment rate</b>	3.4	6.5	5.5	4.0	3.5
<b>wage inflation</b>	7.6	-2.2	5.0	4.5	5.5
<b>hours worked</b>	0.0	-12.5	6.5	4.6	3.1
Severe Scenario					
	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>
<b>Real GDP</b>	4.4	-15.1	2.6	3.0	5.5
<b>Real Investment</b>	7.2	-18.0	6.0	5.0	8.0
<b>Employment</b>	5.7	-8.0	2.5	2.0	2.5
<b>Unemployment rate</b>	3.4	7.0	6.0	4.5	4.0
<b>wage inflation</b>	7.6	-2.5	4.0	3.5	4.5
<b>hours worked</b>	0.0	-13.5	5.5	3.6	2.1

**Appendix 2.10 Scenario based analysis of the impact on potential output levels and growth in the medium run**

**Table 2.2 Decline in the level of potential output compared to pre Covid-19 MFN estimates (as a % of MFN estimates)**

<b>Year</b>	<b>Mild</b>	<b>Medium</b>	<b>Severe</b>
2020	5.5	8.1	10.5
2021	7.3	11.0	14.4
2022	8.7	13.4	17.7
2023	9.3	15.0	20.0

**Table 2.3 Comparison of potential output growth estimates**

<b>Year</b>	<b>MFN Autumn 2019</b>	<b>Mild</b>	<b>Medium</b>	<b>Severe</b>
2020	5.6	2.6	1.3	0.2
2021	4.4	2.4	1.1	-0.1
2022	4.0	2.4	1.2	0.0
2023	3.6	2.9	1.7	0.6

# Chapter 3

A comparative analysis of the key drivers of competitiveness



### **3.1 Defining National Competitiveness**

Competitiveness is an area which remains at the top of the agenda among researchers and practitioners. This is because of its importance for economic growth and prosperity. In line with the expansive amount of research in relation to the area, the World Economic Forum (WEF) stipulates that that competitive countries are more likely to grow in a sustainable and inclusive manner, enabling both social and economic growth.

The concept of competitiveness is complex and multidimensional. In fact, national-level competitiveness, has been interpreted and defined by different scholars and practitioners in different ways (Kharlamova & Vertelieva, 2013). There are numerous interrelated elements that compose the economic ecosystem, each of which may have an influence on competitiveness.

In the business environment, the notion of competitiveness is very straightforward. For the private sector, competitiveness revolves around profitability and market share. Conversely, at a national level, the notion of competitiveness goes beyond the idea of economic growth and performance. An important aspect of competitiveness that seems to be reaching a consensus among academics, practitioners, businesses, and politicians worldwide is the importance of economic quality and a long-term approach in competitiveness. That is, competitiveness is not only related to the economic performance of a country but also to social well-being and environmental growth for both the present and future generation (Porter, Delgado, Ketels, & Stern, 2008). This is based on the fact that it is only through social and environmental growth that people can be productive and prosper.

Based on the importance of both quality and quantity in the notion of competitiveness, for the purpose of this study we define competitiveness as the “expected level of output per working-age individual that is supported by the overall quality of a country as a place to do business” (Delgado, Ketels, Porter, & Stern, 2012, pg. 1). As the authors themselves explain, this definition goes beyond the simple measure of national productivity and thus GDP growth. It endorses the idea that the quality of life of people is in itself an important element to make a country competitive, productive, and attractive for investment purposes.

The analysis in this section is important in terms of productivity as national productivity and competitiveness are intertwined. In fact, some reports have treated productivity as a proxy to national competitiveness (Moon, Rugman, & Verbeke, 1998; Wilson, Lindbergh, & Graff, 2014). In fact, Porter (2004) defines competitiveness as the “the productivity with which a nation uses its human, capital, and natural resources” (pg.19). While productivity is a key enabler of competitiveness, the higher the productivity is the higher the competitiveness will be. However, productivity depends on the other key enablers that constitute competitiveness, such as investment in technology, human capital, health, market efficiency, competition, and so on. For example, higher competition and innovation drives business leaders to be more efficient and productive, human capital is also known to enhance productivity (CMA, 2015; Dostie, 2014).

In line with this definition, in this section we shall be looking at different factors that determine competitiveness. The competitiveness enablers reviewed in this section include factor (input) conditions, which include human capital and social infrastructure, physical infrastructure, and ease of doing business. The analysis of factor conditions is followed by an analysis of institutional quality, monetary and fiscal policy, market conditions, and innovation. Following this analysis, an overview of Malta’s overall competitiveness and sustainable competitiveness is provided. The analysis of these different components involves a comparison between Malta, the EU-27 countries, and EA-19 countries. In each section the main challenges and opportunities for Malta are outlined, including those that have emerged as a result of COVID-19.

The overall aim of this section is to take stock on where Malta stands in terms of its competitiveness and potential productivity. The challenges and opportunities identified throughout the different sections of this chapter will be used to develop area specific policy considerations. These policy considerations are designed to complement the overarching recommendations outlined in the final chapter. These challenges and opportunities reinforce and expand upon the analysis, challenges, and opportunities outlined in last year’s National Productivity Board (NPB) report for Malta.

### **3.2 Factor (Input) Conditions**

The quality and quantity of factor inputs are the building blocks and foundation of economic productivity and value added. Typically factor inputs range from natural endowments, human capital, capital investment, and entrepreneurial activity. Because



of the size, absence of natural resources and geographical location of the Maltese economy, the quantity of factor inputs in Malta is limited. This implies that the quality of human capital, infrastructure, and ease of doing business remain imperative for the country's competitiveness. These elements will be analysed in this section.

### **3.2.1 Human Capital and Social Infrastructure**

The World Bank defines human capital as the “the knowledge, skills, and health that people accumulate throughout their lives, enabling them to realize their potential as productive members of society” (World Bank, 2018, pg. 50). This comprehensive definition shall be adopted for this report. Evidence has consistently shown that both the quality and quantity of human capital is likely to lead to economic growth and prosperity (Neira, Vázquez, & Portela, 2009; Pelinescu, 2015; Wilson & Briscoe, 2004). Compared to larger countries, the role of human capital is especially crucial for Malta's competitiveness. As a result of the inherent disadvantages, small countries need to remain competitive by maximizing the quality and quantity of their workforce as opposed to their physical capital. The role of human capital becomes even more important within the context of knowledge-intensive industries. These industries generate high value added and depend heavily on the quality of the workforce.

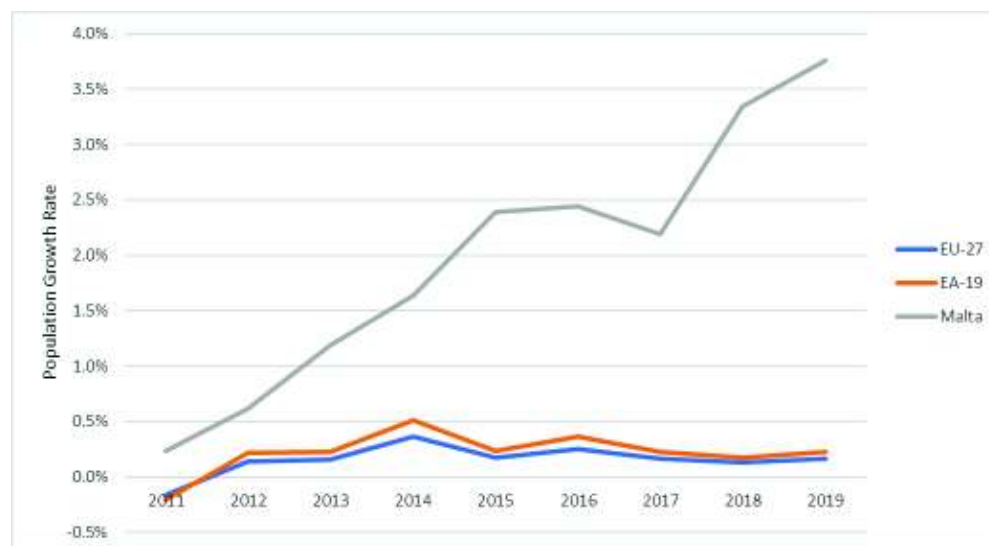
As outlined by the definition of the World Bank, the quality of human capital is not only based on the educational levels of the society but also on its health. Now, more than ever, with the COVID-19 situation, we have come to realize that economies depend on the health of its societies.

This section outlines the demographics of the Maltese population to understand the structure of the economic supply from a labour perspective (section 3.2.1.1). This is followed by an analysis of the main health (section 3.2.1.2) and education indicators (section 3.2.1.3). The section proceeds with an analysis of the Human Capital Index published by the World Bank (section 3.2.1.4).

### 3.2.1.1 Demographics

A snapshot analysis of the demographic situation in Malta is important to provide a background on the supply of total human capital. The quality of human capital is then analysed through health and education indicators. Eurostat data shows that as at January 2019, the total population in Malta stood at 493,559. It is evident that since 2011, the population in Malta has gone through a significant growth (See chart 3.1). The significant increase in growth is especially evident when comparing it to the average annual growth rate in the Euro Area (EA-19) and EU average (EU-27). Between 2017 and 2019, on average the population growth registered in Malta was 3.1% compared to 0.2% average growth in EA-19 and EU-27 during the same period. On average, the rate of population growth for Malta was lower between 2011 and 2013 (0.7%) and between 2014 and 2017 (2.2%). The increase in population growth was also accompanied by an increase in GDP per capita (PPP) (See chart 3.2).

**Chart 3.1 Population Growth Comparison: Malta, EU, and EA**



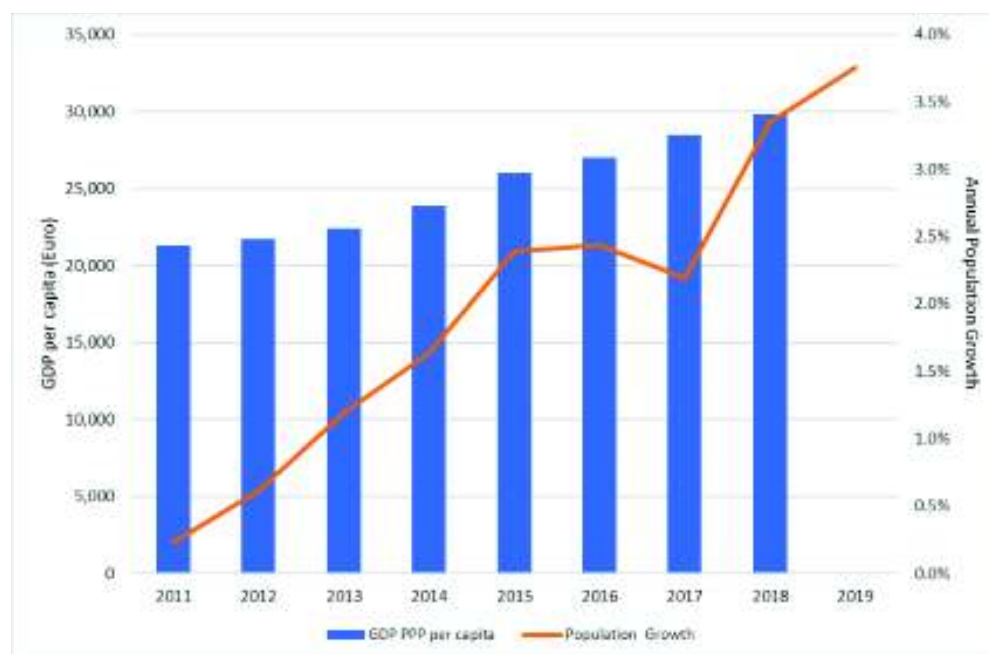
Source: Eurostat (2020)

An important element that has changed the dynamics of the population of Malta, especially over the recent years, is the influx of foreign workers. As indicated in chart 3.3, Malta's immigration rate since 2011 has always been higher than that of the EU-27 average rate, with the latter retaining a rate per 1000 inhabitants below 10. However, the gap has widened over the years, with Malta's rate increasing significantly



in 2017 and 2018. In 2017, the immigration rate per 1000 inhabitants exceeded 40, while in 2018 it exceeded 50, the highest rates in the EU. As at 2018, the number of foreign workers registered in Malta stood at 55,280<sup>37</sup>. The increase in immigration has been important to address the issue of labour shortages as a result of the full employment situation in the island. The increase in immigration rate was a main contributor to the economic growth registered in Malta over the recent years (IMF, 2020a).

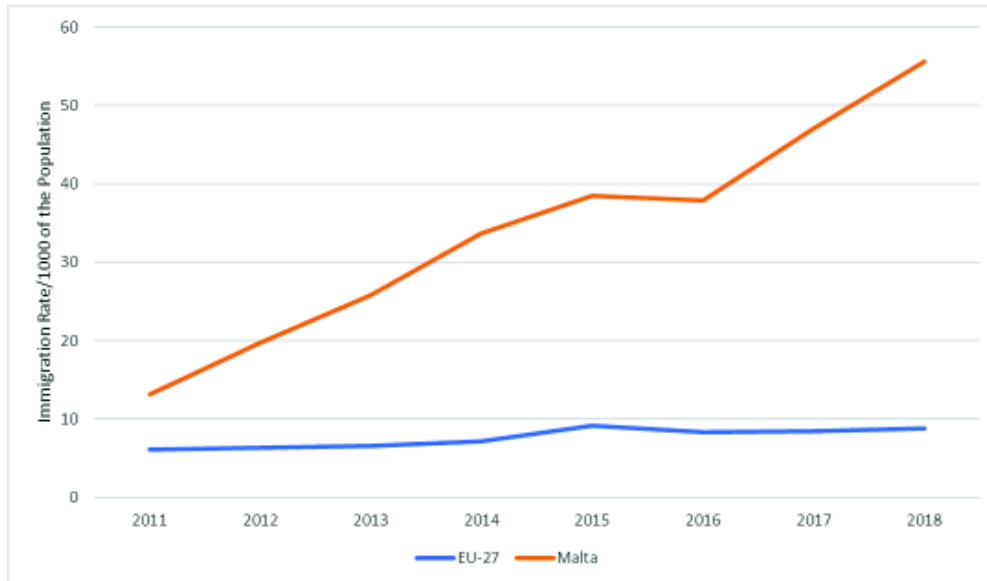
**Chart 3.2 Malta's Population Growth & GDP per capita (PPP)**



Source: Eurostat (2020)

<sup>37</sup> <https://jobsplus.gov.mt/resources/publication-statistics-mt-mt-en-gb/labour-market-information/foreigners-data>

**Chart 3.3 Immigration Rate**

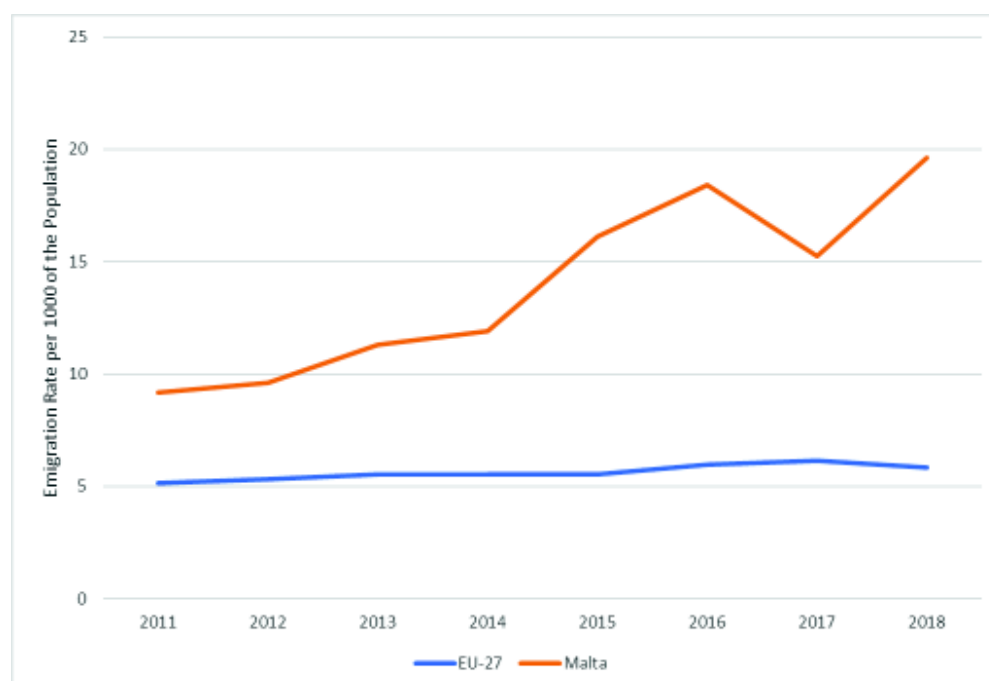


Source: Eurostat (2020)

According to a study by Jobsplus, the National Commission for Further and Higher Education, and Malta Enterprise, while all sectors are experiencing an increase in foreign employment, the highest increases were attributed to the accommodation and food service sectors, followed by administrative and support services (Jobsplus, NCFHE, & ME, 2017). As a result of this influx, evidence indicate that Maltese workers are upgrading into higher skill occupations. Still, at least during the pre-COVID-19 situation, labour shortages in Malta remained a challenge, especially with regards to specific jobs as highlighted later in this report (IMF, 2020a).

In comparison with the EU-27 average, Malta did not only experience a high immigration rate but also a high emigration rate (See chart 3.4). The EU-27 average rate over the years stood between 5 and 6. Malta's rate exceeded 9 for the years under review. Since 2015, the emigration rate exceeded 15 per thousand inhabitants. While between 2017 and 2018, Malta experienced a sharp increase in the emigration rate, from just over 15 to almost 20.

**Chart 3.4 Emigration Rate**

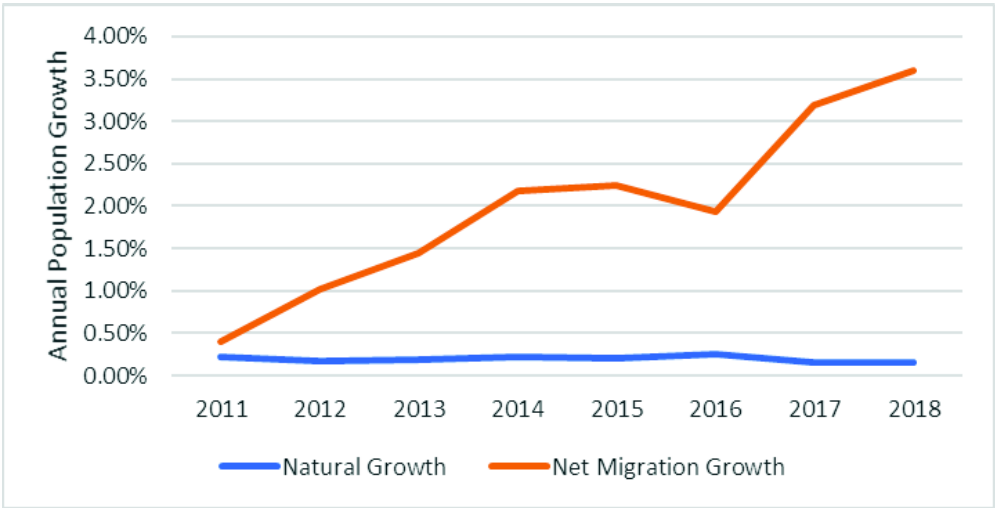


Source: Eurostat (2020)

The high immigration and emigration may be a result of high labour mobility, and thus the more people go to work in Malta, the more movement there is likely to be. In fact, a study conducted by the Central Bank of Malta for the period 2002-2017 indicates that the length of stay of foreign workers is short, on average 3.5 years (Borg, 2019). The increase in Malta's population is mainly generated by an increase in net migration (See chart 3.5). Indeed, despite the high rates of both immigration and emigration, the former remains higher. Foreign workers are increasingly attracted to come to work in Malta. The chart also indicates that the natural growth rate for Malta is very low.

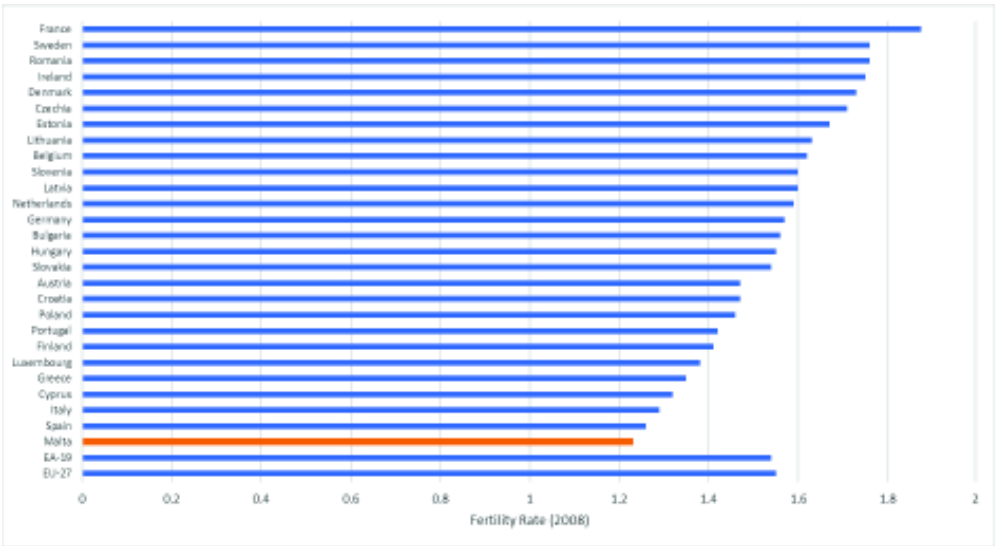
Malta has registered the lowest fertility rate across the EU (See chart 3.6). At the same time, the fertility rate in Malta has declined at a fast rate over the period 2011-2018, while that of the EU-27 and EA-19 averages has remained rather stable across the same period (See chart 3.7).

**Chart 3.5 Population Growth Structure, Malta – 2011-2018**



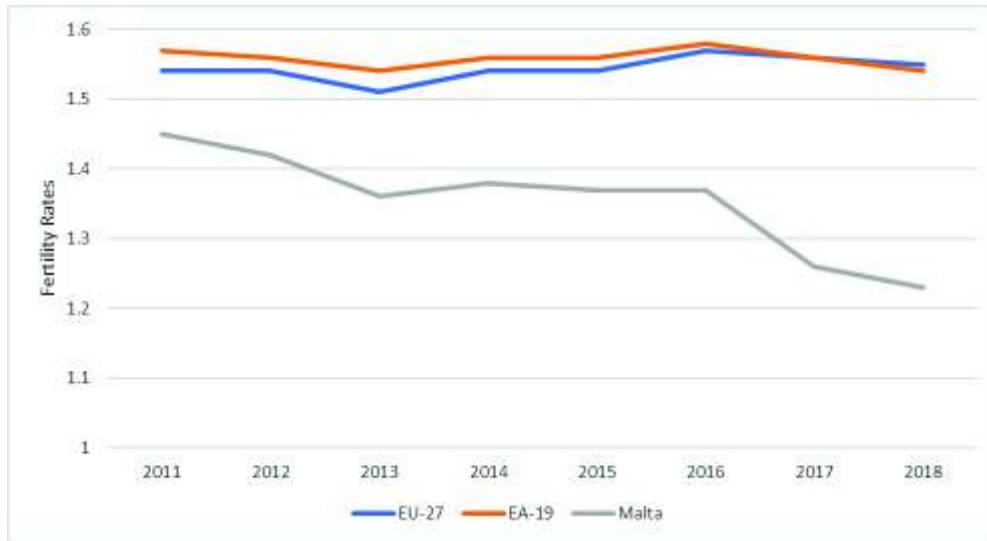
Source: Eurostat (2020)

**Chart 3.6 Fertility Rates across the EU**



Source: Eurostat (2020)

**Chart 3.7 Fertility Rates Time Trends**



Source: Eurostat (2020)

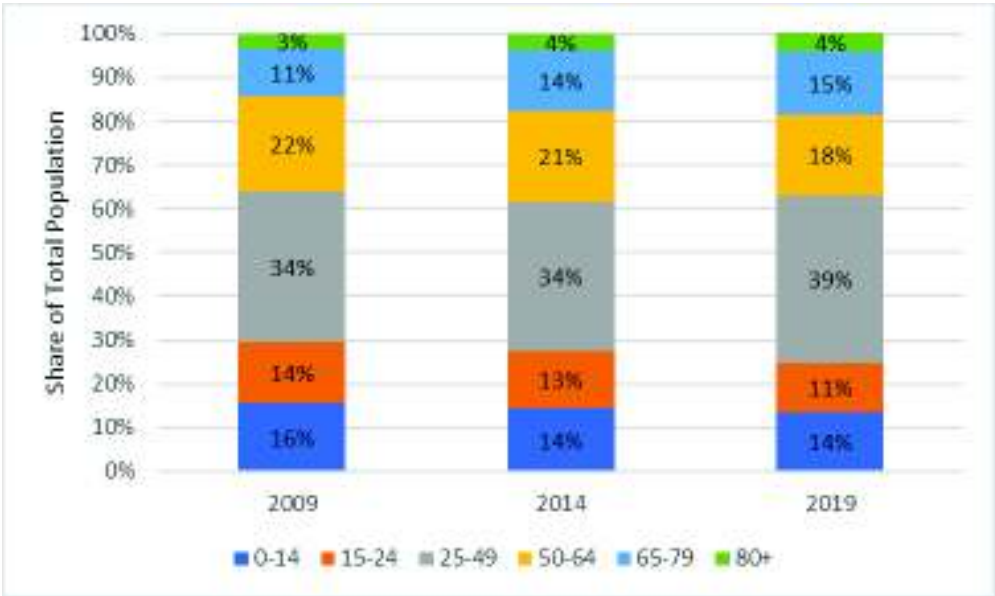
**Chart 3.8** represents Malta's population for 2009, 2014, and 2019 by age structure. In the past decade the highest increase in population was within the 25-49 age cohort, mainly as a result of the high immigration influx as discussed previously in this section. Also, there has been an increase in the 65+ categories which represents an ageing population. On the other hand, decreased rates were seen in the 50-64 age cohorts and also among the 0-14, 15-22 age groups, the latter two representing the future workforce.

**Chart 3.9** shows that Malta's proportion of individuals between the ages of 0-14 is lower than the EA-19 and EU-27 averages. This could also be attributed to the low fertility rates recorded over the past years. The proportion of the 15-24 cohort is at the same level of these averages. On the other hand, the proportion of the 25-49 age cohort in Malta is much higher than the EA-19 and EU-27 averages. This may partly explain why Malta has experienced significant economic growth rates over the past years compared to the EU and EA averages. The 50-64 age cohort in Malta is lower than the other averages, while the 65+ cohorts are similar across the three groups.

**Chart 3.10** illustrates the population forecasts for Malta up to 2050. The projections indicate that Malta's population growth is likely to remain higher than that of the EU-27 and EA-19 averages. The rate of growth is however expected to decline from 10% in

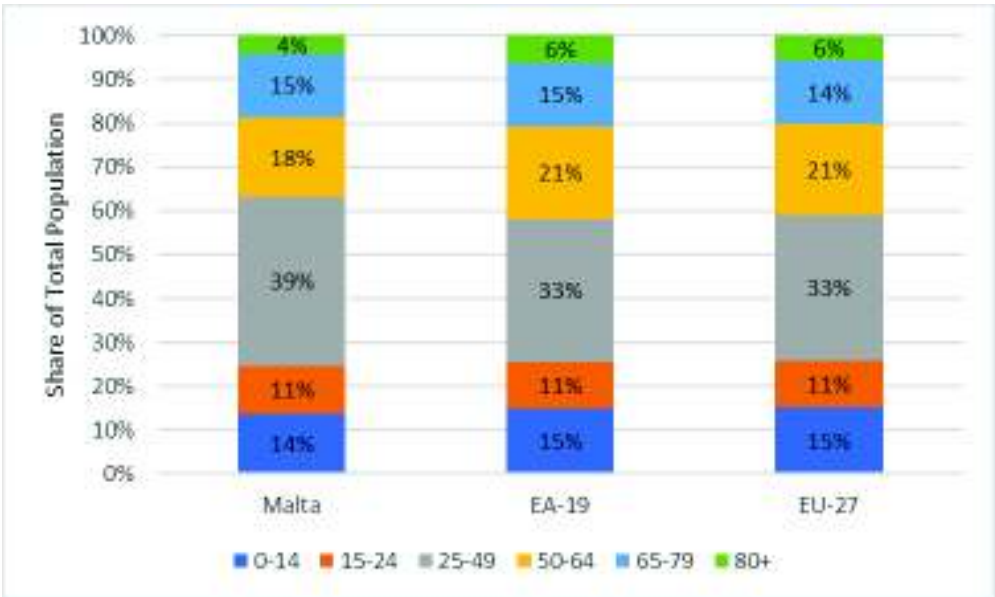
2020-2025 to just over 2% for the period 2045-2050. This implies that the rate of growth is likely to continue increasing albeit at a slower pace.

**Chart 3.8 Population in Malta by Age Structure**



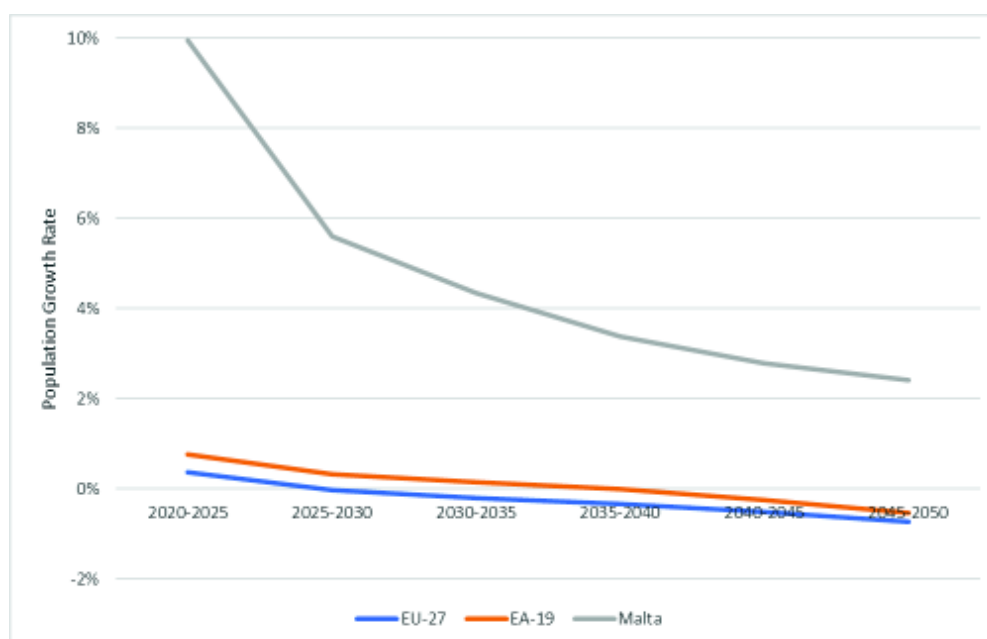
Source: Eurostat (2020)

**Chart 3.9 Population in Malta, EA-19, EU-27 by Age Structure**



Source: Eurostat (2020)

**Chart 3.10 Population Forecasts**



Source: Eurostat (2020)

These projecting are further confirmed through the 2018 Ageing Report published by the European Commission (Commission, 2018). The report shows that the total population in Malta is expected to reach 521,000 in 2070. The share of individuals aged 0-14 is expected to remain stable at 15%, while the share of 65+ is expected to reach 27.9%. On the other hand, the working age population which is persons within 20-64 are expected to fall to 46.2% from 61%. In addition, net migration flows are expected to decline from 0.8% to 0.2%.

It is worth noting that these projections do not take into consideration the COVID-19 situation which could possibly change some population dynamics. During COVID-19, foreign workers with an expired work permit had to return to their home country, thus increasing the emigration rate in Malta much more than predicted pre-COVID-19. In total, up to mid-April, the government announced that 4,700 workers were repatriated.

Based on the analysis above, the challenges and opportunities related to Malta in terms of demographics are highlighted in the [Table 3.1](#). The table also includes the demographic-related policy considerations which complement the recommendations in the final chapter.

Overall, the analysis shows that in order to remain competitive, Malta needs to ensure that it remains attractive to foreign workers, while also introducing measures that aim at enhancing the fertility rates in order to mitigate for the increasing demographic challenges.

**Table 3.1 Demographic Challenges, Opportunities and Policy Considerations**

Challenges	Opportunities	Policy Considerations
Stay of foreign workers is short, 3.5 years, high emigration rate.	Influx of foreign workers, immigration higher than EU average. Malta is attractive for foreign workers.	
Fertility rates declined significantly between 2016 and 2019 (lowest across the EU-27).	In the past years, an increase in age cohort 25-49 was registered, the share of the cohort from the total population is higher than the EU average.	1. Attract foreign workers with potential of contributing to a high value-added.
In the past years there was an increase in ageing population, decrease in age cohort 50-64 (lower than EU average), decrease in population aged 0-24 (in line with EU average).	Population growth will decline but will remain higher than EU average.	2. Attract Maltese workers who work abroad.
By 2070, share of persons aged 65+ will increase, and share of persons between 20 and 64 will decrease.		
By 2070, net migration flows are expected to decline.		
<b>COVID-19 Impact</b>		
Foreign workers repatriated to their home country, reducing the share of persons aged 20-49.		

Source: Authors



### 3.2.1.2 Health

An overall improved health status is crucial in order to enhance competitiveness. The link between health and competitiveness is based on the fact that health is an enabler of economic productivity. We have been experiencing this link first-hand throughout the COVID-19 situation. The foundations of health for competitiveness can be analysed in terms of the quality and accessibility of the healthcare system, health expenditure and life expectancy (Delgado et al., 2012).

In terms of health accessibility, Malta's health services are vast and provided by the private sector and the state. In the case of long-term and chronic care, there are important service providers including the Catholic Church and voluntary organisations. The state, through the public healthcare system provides a wide range of healthcare services to Maltese residents who pay social security. Healthcare services are also provided to irregular immigrants and workers who have a work permit. These services are all provided with no charges. Alternatively, people have the option of private healthcare against payment.

The healthcare sector in Malta has been going through important changes throughout the recent years. Three hospitals have been privatised with the aim of enhancing efficiency and effectiveness in the delivery of healthcare services. In addition, the Government has invested in a new oncology hospital in 2016. Various other investment plans are in the pipeline including the new mental health hospital at Mater Dei which is expected to be open by 2025<sup>38</sup>, refurbishment of the current mental health hospital<sup>39</sup>, and the Paola Primary Healthcare Southern Regional Hub.

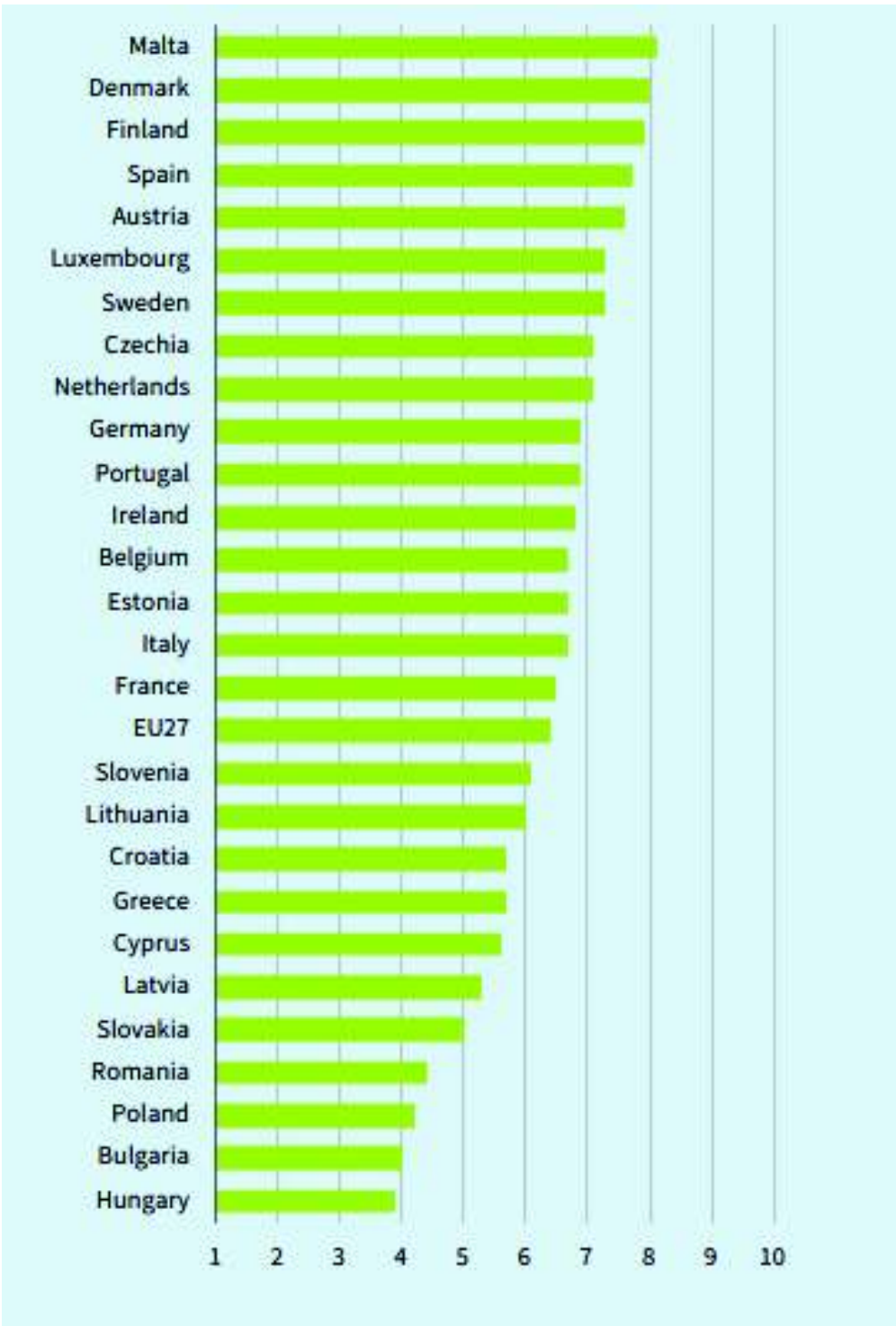
Malta's healthcare system is widely trusted by its residents. In fact, a recent study conducted by Eurofound (2020), show that Malta tops the list across EU-27 countries when it comes to trust in the healthcare system (See chart 3.11). This trust rating reflects the quality and even accessibility of the healthcare system.

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<sup>38</sup> <https://timesofmalta.com/articles/view/new-mental-health-hospital-completion-date-set-for-2025.695951>

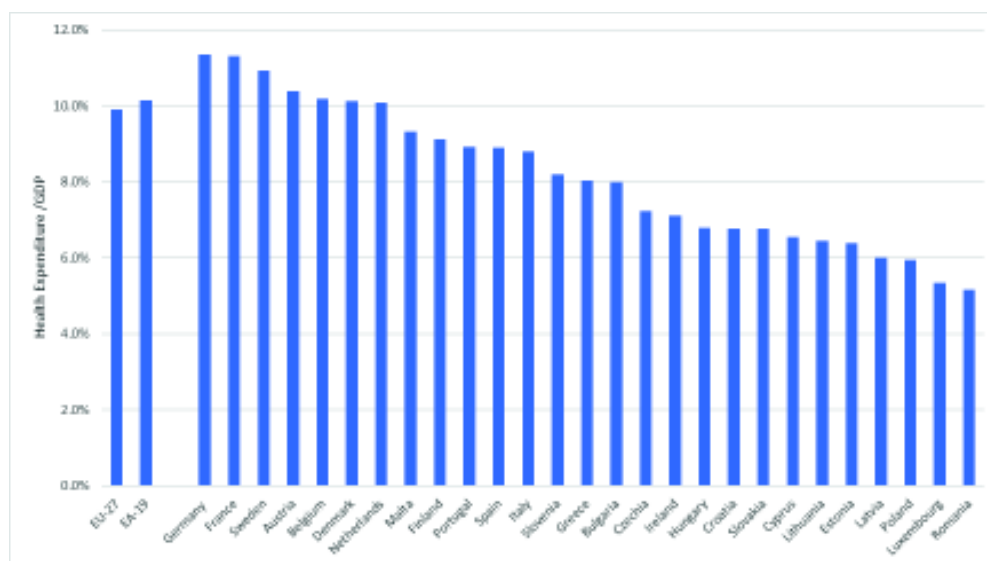
<sup>39</sup> <https://timesofmalta.com/articles/view/new-mental-health-hospital-completion-date-set-for-2025.695951>

Chart 3.11 Trust in Healthcare system



Source: Eurofound (2020)

**Chart 3.12 Health Expenditure relative to GDP, 2017**

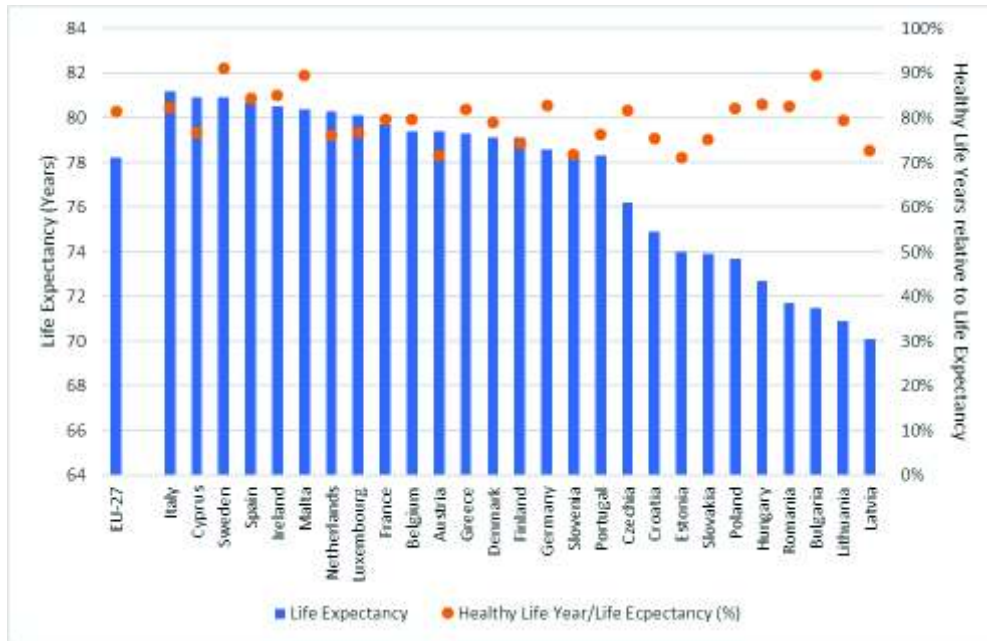


Source: Eurostat (2020)

The trust in the healthcare system may also be attributed to the substantial healthcare spending by all providers of healthcare to ensure that the quality of the healthcare service is sustained. As a percentage of GDP, Malta's total health expenditure in 2017 stood at 9.3%. The amount is just below EU-27 and EA-19 average, however, it should be noted that Malta is among the top ten countries when it comes to health expenditure relative to GDP.

Another indicator for health status is the life expectancy. Malta's life expectancy has been on the increase since the mid-90s (Azzopardi Muscat, Calleja, Buttigieg, & Merkur, 2017). Both males and females in Malta place 6<sup>th</sup> in terms of life expectancy across the EU (See charts 3.13 and 3.14). In the EU, on average males have a life expectancy of 78 while females have a life expectancy of 84. In Malta, males have a life expectancy of 80 while females have a life expectancy of 85. According to the Ageing report by the European Commission (2018), life expectancy of both males and females is expected to continue increasing reaching the levels of 90.6 for females and 86.8 for males by 2070.

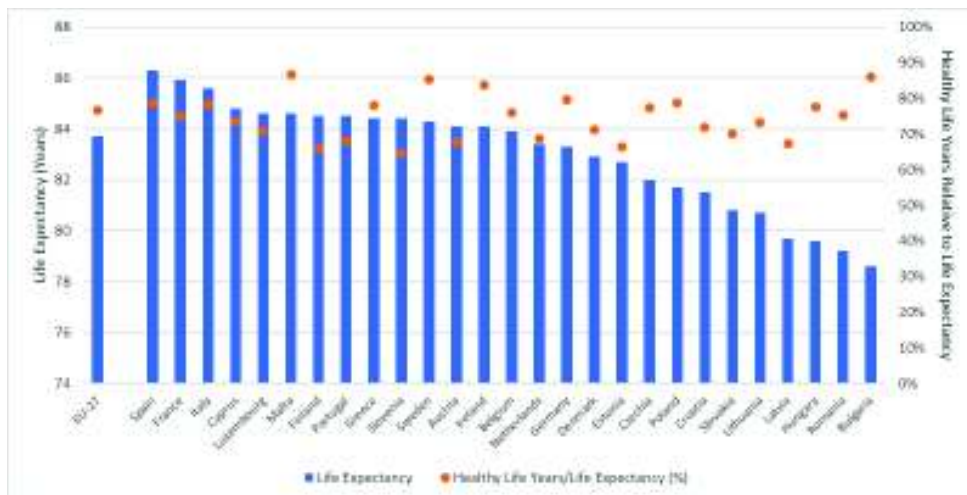
**Chart 3.13 Life Expectancy and Healthy Life Years, Males, 2018**



Source: Eurostat (2020)

Maltese residents do not only enjoy one of the highest life expectancy across the EU, but also one of the longest life expectancies. In the EU, on average healthy life expectancy relative to life expectancy stands at 81% for Maltese and 77% for females, while in Malta the rates are 89% (placing 3<sup>rd</sup>) and 87% (placing 1<sup>st</sup>), respectively.

**Chart 3.14: Life Expectancy and Healthy Life Years, Females, 2018**



Source: Eurostat (2020)

Despite this progress, the health sector in Malta is characterised by various challenges. As outlined in a report by the European Observer titled “Healthcare Systems in Transition” (Azzopardi-Muscat, Buttigieg, & Calleja, 2017), the Maltese health system is currently facing challenges in terms of adapting the health system to an increasingly diverse, growing and ageing population, limited human resources, decentralisation of services from hospitals to clinics, ensuring access to expensive and new medicine, enhancing financial sustainability, improve health related behaviours such as obesity, drinking and smoking, increasing equitable access, and increasing efficiency and quality in the delivery of healthcare.

These issues are being presently addressed through the National Health System Strategy adopted in 2014, and various other measures. For example, over the recent years government invested in reforms in procurement, stock control, and management systems. Some of the care is being commissioned to the private sector to reduce waiting list and ensure equitable access to healthcare. In 2012, Malta launched an obesity strategy to address this pertinent issue. Moreover, services are being decentralised from hospital to primary care setting in order to reduce the burdens on Mater Dei. There are many other measures in place in order to address the increasing issues of the healthcare system.

In line with the National Health System Strategy, different healthcare strategies focusing on specific issues are in place such as the national cancer plan, the national breastfeeding policy and action plan, the transgender healthcare the national strategy for the elimination of hepatitis C Virus, the mental health strategy for Malta 2020-2030, and the diabetes strategy.

Another important challenge is related to research and innovation in healthcare. This challenge has also been pointed out in last year’s report. The national research and innovation (R&I) strategy identifies health as one of the key areas of specialisation in terms of R&I in Malta. The strategy acknowledges that while health is a significant component of R&D, research is fragmented. In this regard, the strategy states that focus of R&I in health should be multidisciplinary (involving ICT, social sciences, and engineering) with specific focus on healthy living and active ageing, and e-health.

The main strengths and opportunities related to the health sector in Malta are outlined in [table 3.2](#), together with the health-related policy considerations. The table also

highlights the challenges brought about by the COVID-19 pandemic namely, the increased pressure on the physical and human resources, ensuring that Malta is able to pay for the vaccine, and adapting to potential future threats related to globalisation. Recommendations based on this analysis are provided further on in the study.

**Table 3.2 Health Challenges, Opportunities and Policy Considerations**

Challenges	Opportunities	Policy Considerations
Diverse, growing, and ageing population.	Ongoing structural investment in the health system: new cancer hospital built in 2015, new mental health hospital at Mater Dei, refurbishment of current mental health hospital, Paola Primary Healthcare Southern Regional Hub are in progress.	1. Ensure the effective implementation of the National Health System Strategy and other policies, strategies and measures that are aimed to address the challenges in the healthcare system.
Governance & Organisation.		2. Promote investment in R&I that is multidisciplinary, focusing on healthy living and active ageing, and e-health.
Access to new expensive medicine, and equitable access to healthcare services.		
Promoting prevention through changes in health-related behaviour.	Healthcare system in Malta is highly trusted by the people.	
Financial sustainability.	High levels of health expenditure per capita.	
Research and Innovation.	High life expectancy and healthy life years, which are expected to continue increasing.	
Lack of human resources.		

### **COVID-19 Impact**

Increased pressure on Mater Dei and hospital staff in dealing with the pandemic.

Ensuring access to the COVID-19 vaccine.

Adapting the healthcare system to any future pandemic threats.

*Source: Authors*

### **3.2.1.3 Education, Training, and Life-Long Learning**

In line with the quantity of the present and potential workforce, competitiveness depends also on the quality of the present and potential workforce. Training, lifelong learning, formal education, and research have a significant impact on the economy at large and its prosperity (Benos & Zotou, 2014; Delgado et al., 2012). For Malta, the quality of human capital is even more important given that the country depends on its human resource to generate growth. In fact, one of the key elements that attracts foreign investment is the fact that the nation can speak various languages apart from Maltese. English is also an official language in Malta. Other popular foreign languages include Italian, French, German, and Spanish<sup>40</sup>.

One of the most widely cited indicators of the level of education in a country is the Early School Leaving Rate. The early leavers from education and training represent youth between the age of 18 and 24 who did not get any education or training beyond the lower secondary level (Form 5). Malta has one of the second highest rate of early leavers from education and training in the European Union, significantly exceeding the average rate in the Euro Area and EU (See chart 3.15). Data shows that almost 17.0% of the youth between 18 and 24 years of age (compared to 10.2% and 10.6% in the EU-27 and EA-19, respectively), quit educational progression in Malta. This is beyond the 10% drop-out rate outlined for Malta by the EU as a 2020 target. In line with EU trends, Eurostat figures show that the rate in Malta is higher among men (18.3%), compared to women (14.8%).

This is not a phenomenon that we have been experiencing recently. The gap between Malta and the European Union in this regard has been present for at least a decade.

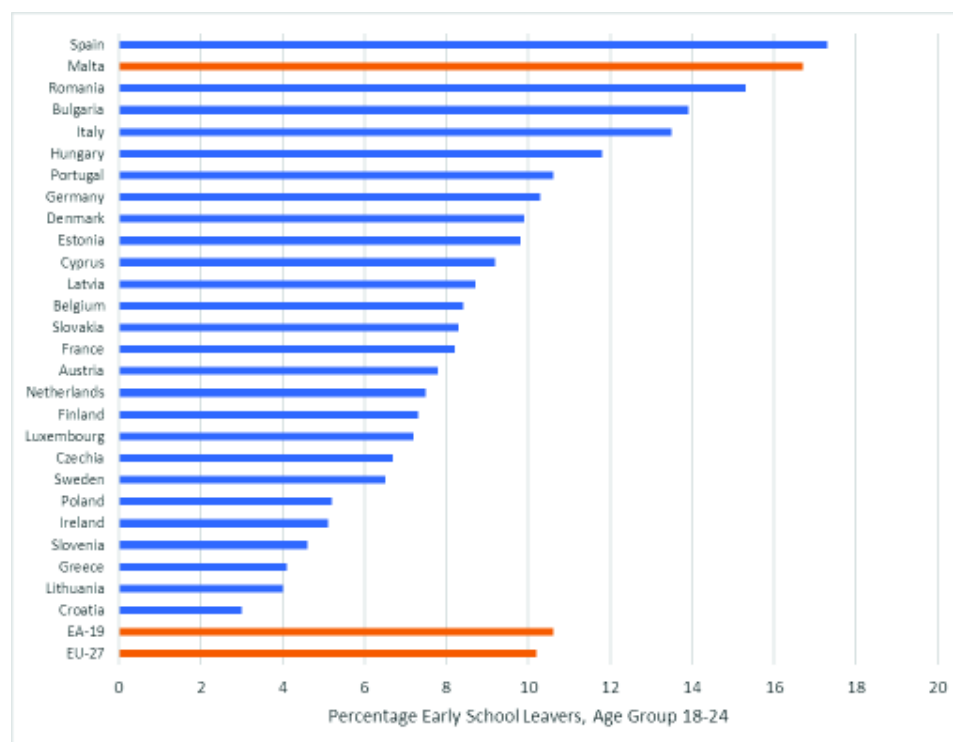
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<sup>40</sup> <http://www.kunsilltalmalti.gov.mt/eng>

While the policies that were put in place over the years have helped in reducing the rate (the rate in 2009 stood at 25.7%), they did not lead to convergence with EU averages. These outcomes are reflected in the GCI whereby Malta registered a lower score compared to the EA-19 and EU-27 averages for mean years of schooling completed by persons that are aged 25 and over, and the school life expectancy of students. The critical thinking in teaching, quality of vocational training, and pupil-to-teacher ratio indicators are also slightly lower for Malta, which could have an impact on this rate to some extent.

In **Box 3.1** the impact of the macroeconomic and socio-economic factors on early school leaving rates are assessed. The outcomes of this section show that effective policies need to be complex with an evidence-based understanding, addressing the multiple dimensions of the phenomenon. Each country has its specific macroeconomic and socioeconomic characteristics and other characteristics which are not outlined in this Box. Thus, tailored policies should be implemented in this regard.

**Chart 3.15 Early leavers from education and training, age group 18-24, 2019**



Source: Eurostat (2020)



### Box 3.1 The Macroeconomic and Socio-economic Implications on the Early School Leaving Rate

The long-term effects of the relatively high early school leaving rate are likely to be an important factor which determines the present high early school leaving rate. Using fuzzy-set Qualitative Comparative Analysis (fsQCA) (see Appendix 3.1 for details on fsQCA and measures), Fabri, Cassar, Martinelli, and Spiteri (forthcoming) investigate a number of macroeconomic and socio-economic conditions associated with high and low rates of Early School leaving, based on a panel data of the EU-28 countries for the time period 2014-2017 (See table 3.3).

The results in the Table below show that high rates of early school leaving are associated with low education levels, irrespective of the GDP levels (Configurations 1 and 4). This is further confirmed by the fact that the educational levels in three from the four configurations are high when looking at low early school leaving rates (configurations 5,7 and 8).

**Table 3.3: Sufficient Condition, High/Low Early School Leaving Rate<sup>41</sup>**

Permutation	High School Leaving Rate				Low School Leaving Rate			
	1	2	3	4	5	6	7	8
<i>Macroeconomic Conditions</i>								
GDP	⊗	⊗	⊗	●	●	●	⊗	●
Inequality	⊗	●	●	●	⊗	⊗	⊗	●
Youth Unemployment	⊗	●	●	●		●	⊗	●
<i>Socio-Economic Conditions</i>								
Parents' Education Level	⊗	⊗	●	⊗	●		●	●
Parents' Professional Status	⊗	⊗	●	●	●	●	⊗	⊗
Consistency	0.929	0.898	0.855	0.868	0.945	0.945	0.980	0.698
Raw Coverage	0.354	0.526	0.388	0.430	0.471	0.350	0.283	0.241
Unique Coverage	0.073	0.112	0.020	0.031	0.122	0.022	0.051	0.036
<b>Overall Solution Consistency</b>	<b>0.789</b>				<b>0.936</b>			
<b>Overall Solution Coverage</b>	<b>0.687</b>				<b>0.583</b>			

*Fabri, Cassar, Martinelli, and Spiteri (forthcoming)*

When both parent's level of education and professional status in a nation tend to be low, combined with low GDP, the school leaving rates are likely to be high, irrespective of the level of inequality and youth unemployment (Configurations 1 and 2). On the other hand, when the professional status of parents is relatively high, but

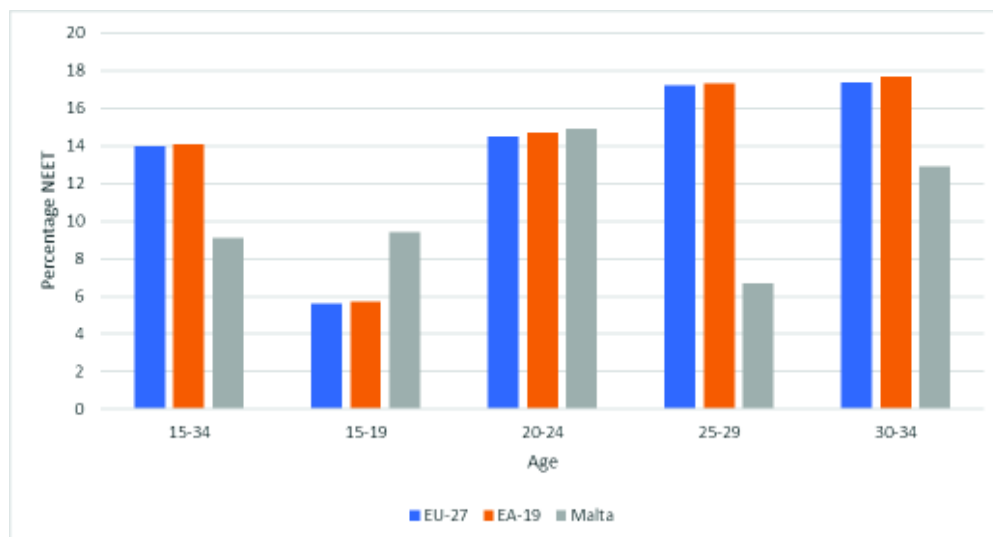
<sup>41</sup> Black circles ("●") indicate that the presence of the condition is high, and open circles ("⊗") indicate that the presence of the condition is low. Blank spaces indicate irrelevance of the condition to the solution.

inequality and youth unemployment are high, the school leaving rate tends to be high too irrespective of the GDP level and parents' educational level (configurations 3 and 4).

Countries with low school leaving rates tend to have high levels of GDP and/or low levels of inequality and/or high levels of parents' educational levels.

Overall, most of the early school leavers seem to find a job by the age of 20. Data in relation to young persons that are neither in employment nor in education and training (NEET) shows that for the age group 15-19, Malta's rate (9.4%) is significantly higher than that of the EU-27 (5.6%) and EA-19 (5.7%) averages. The NEET rate for Malta converges with that of the EU-27 and EA-19 for the age group of youth between 20 and 24 years of age (14.9%, 14.5%, 14.7%, respectively) (See chart 3.16). The rate for youth between the age group 25-34, Malta's rate is significantly lower than the EU-27 and EA-19 averages. This shows that the Maltese labour market does not cater for the inexperienced youth or those with low levels of education.

**Chart 3.16 Young Persons NEET, 2019**



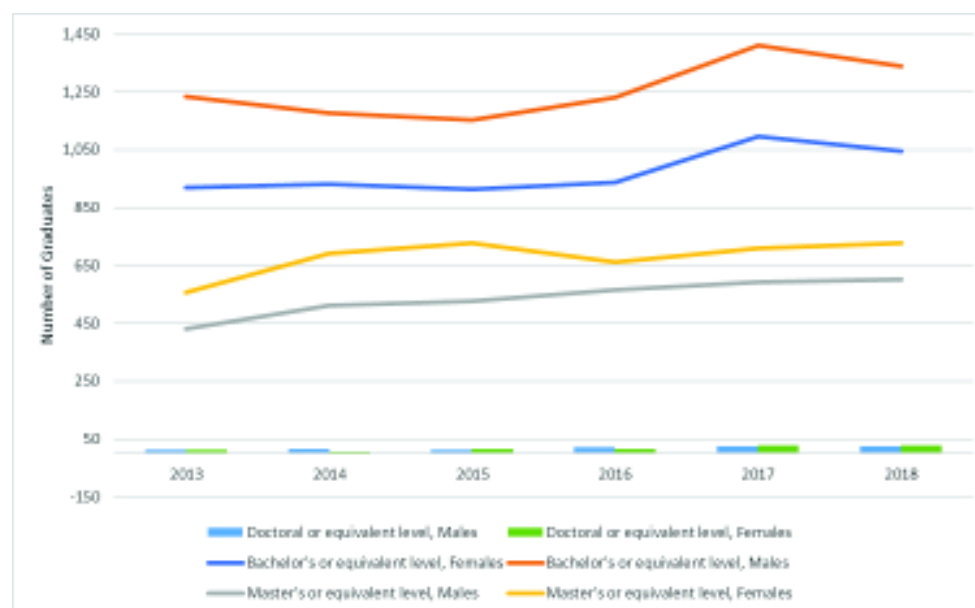
Source: Eurostat (2020)

The number of graduates in Malta declines as we go from Bachelor's level (ISCED 6) to Master's level (ISCED 7), to Doctoral level (ISCED 8) (See chart 3.17). The number of Females graduating across all these levels is consistently higher than the number

of males, except in the case of Doctoral levels where the numbers are very low, yet they converge between males and females. While the number of females graduating is higher than that of males, the growth rate for females seems to be slower than that of males for ISCED levels 6 and 7. Over the period 2013-2018, on average the number of males graduating at ISCED level 6 was 2.9% and that of females was 1.9%. During the same period, the average growth rate of males graduating at ISCED level 7 stood at 7.2% and that of females stood at 6%. Growth rates during this period of males graduating at ISCED level 8 for males stood at 19.2% and for females that rate was 38.7%.

Compared to the EU, when looking at Eurostat data, Malta has a higher amount of Bachelor's graduates as a percentage of the population 0.5%, 0.04 p.p. higher than the EU-27 average. Masters' graduates represent 0.28% of the population in Malta compared to 0.32% in the EU-27 countries on average. Doctoral students represent 0.01% of the population in Malta compared to 0.02% across the EU-27 on average. While the share of graduates may be low, the score for the skillset of graduates exceeds the EU-27 average, but it is slightly lower than the EA-19, according to the GCI (See table 3.2). The employment of these graduates is 95%, exceeding the EU-27 and EA-19 averages of 85% and 83.8% respectively.

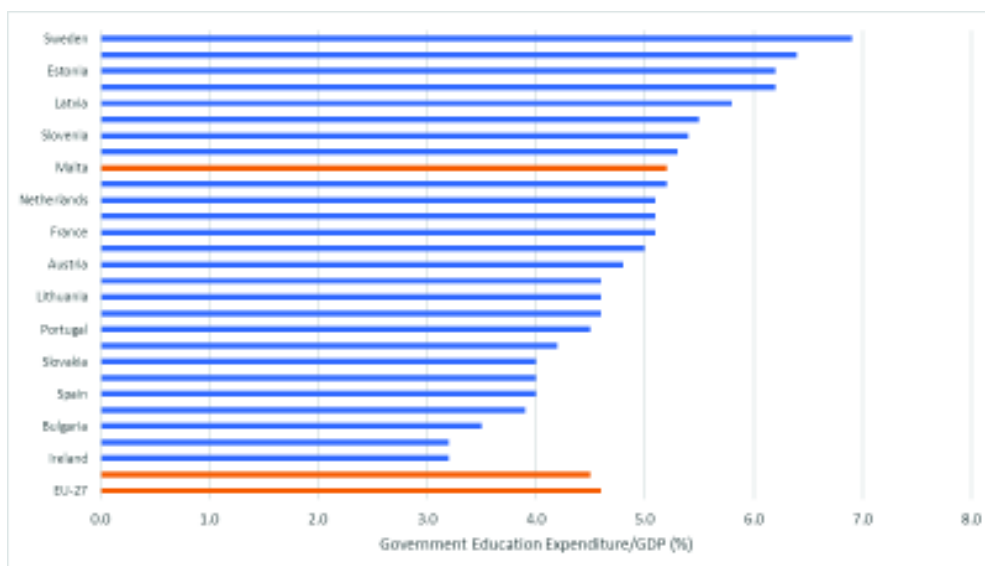
**Chart 3.17 Number of Graduates by Level of Educational Attainment, Malta**



Source: Eurostat (2020)

Governments in Europe play a crucial role in funding the educational system<sup>42</sup>. **Chart 3.18** shows that as a percentage of GDP, education expenditure in Malta is higher than the EU average, the eight highest in Europe (5.2%). The rate in Malta is relatively high mainly because Government funds the formal educational system from primary to university level.

**Chart 3.18 Government Expenditure on Education as a Percentage of GDP**



Source: Eurostat (2020)

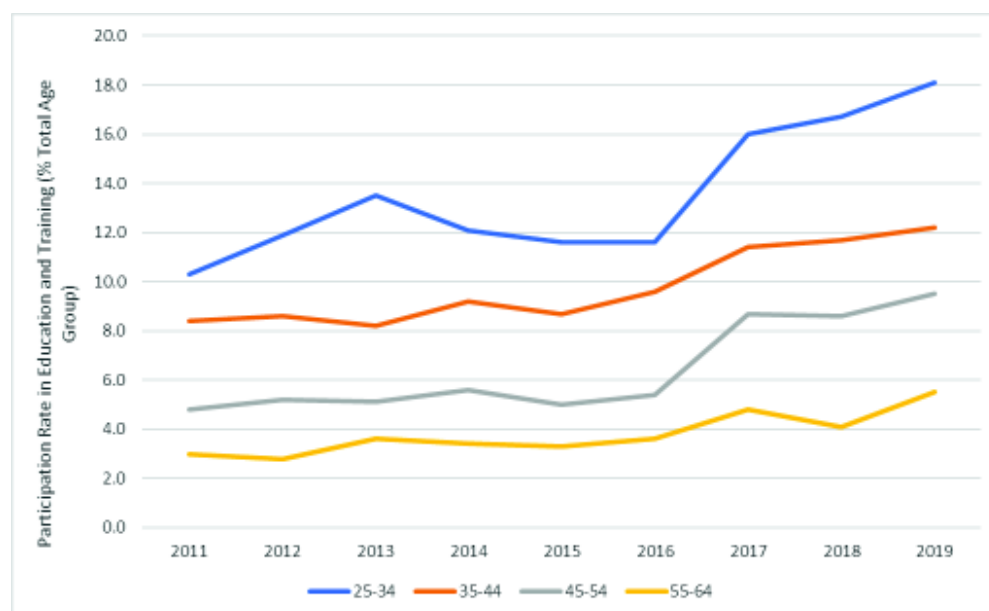
An additional indicator of competitiveness is adult learning or students aged between 25 and 64 who engage in education or training. **Chart 3.19** shows that the adult learning rate declines as the age group increases. For the period under review, on average the rates stood at 13.5%, 9.8%, 6.4%, and 3.8% for the 25-34, 35-44, 45-54, and 55-64 age groups respectively.

**Chart 3.20** illustrates the adult learning rates for 2019, comparing Malta to the EU-27, and EA-19 averages. For the 25-34 age group, Malta's rate is 18.1%, higher than the EU-27 average (17.8%), but lower than the EA-19 average (19.5%). With a rate of 12.2% Malta exceeds both EU-27 (11%) and EA-19 (12%) averages for the 35-44 age group. For the 45-54 age group Malta has a similar rate to EA-19 average (9.5%),

<sup>42</sup> [https://ec.europa.eu/eurostat/statistics-explained/index.php/Educational\\_expenditure\\_statistics](https://ec.europa.eu/eurostat/statistics-explained/index.php/Educational_expenditure_statistics)

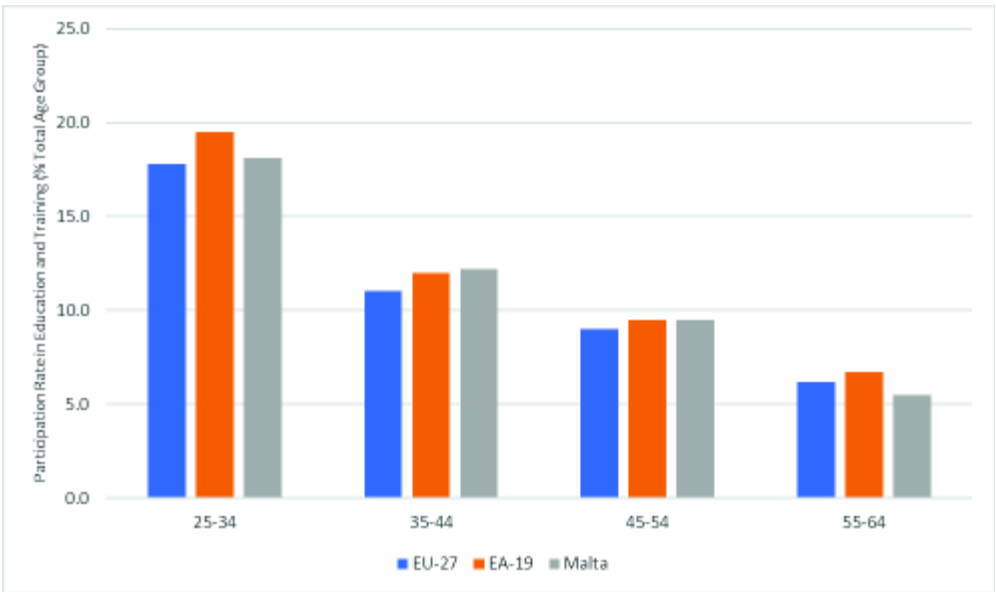
higher than the EU-27 average (9%). Finally, for the 55-64 age group, Malta's rate (5.5%) is lower than the EU-27 (6.2%) and EA-19 (6.7%) averages. This data indicates that although Malta's rates are not far to the EU averages, there is a vast opportunity for improvements. The rates could improve if companies invest more in training their staff. According to the GCI the score for the extent of staff training in Malta in 2019 stood at 50, lower than the EU-27 and EA-19 which were 58 and 60, respectively (See [chart 3.21](#)).

**Chart 3.19 Adult Learning in Malta, 2011-2019**



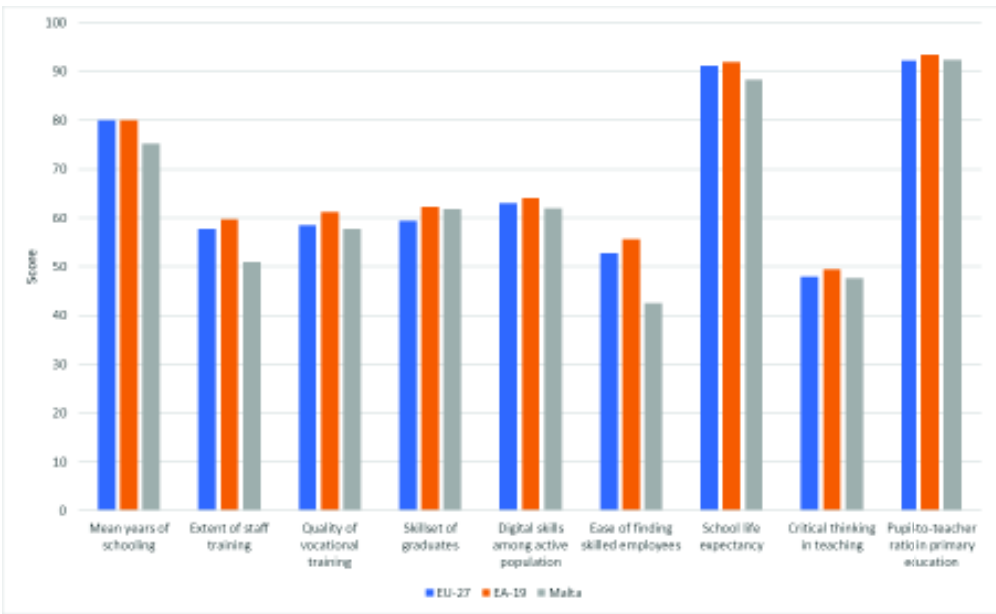
Source: Eurostat (2020)

**Chart 3.20 Adult Learning in EU-27, EA-19, Malta, 2019**



Source: Eurostat (2020)

**Chart 3.21 Skills Indicators 2019**



Source: WEF (2020)

Investment in the educational sector in Malta is an ongoing process. At the moment the government has two key strategies in place. First, the “Framework for the Education Strategy for Malta 2014-2024”<sup>43</sup>. This Framework outline proposals based on four broad goals in line with European and world benchmarks:

1. Reduce the gaps in educational outcomes between boys and girls and between students attending different schools, decrease the number of low achievers and raise the bar in literacy, numeracy, and science and technology competence, and increase student achievement.
2. Support educational achievement of children at-risk-of-poverty and from low socio-economic status, and reduce the relatively high incidence of early school-leavers.
3. Increase participation in lifelong learning and adult learning.
4. Raise levels of student retention and attainment in further, vocational, and tertiary education and training.

There is also the “Higher Education Strategy for Malta” 2015-2024 which is in place. The aims of the strategy are as follows:

1. Increasing participation and attainment in higher education.
2. Reducing gender differences in higher education.
3. Increasing the participation of underrepresented groups in higher education.
4. Increasing the relevance of higher education to the individual and the labour market.
5. Encouraging innovative content and programme design.

Both these strategies will be considered when outlining the recommendations, later in this report.

**Table 3.3** takes stock of the challenges and opportunities associated with education and training identified in this section. The table also highlights additional challenges brought about by COVID-19. Without any doubt, the current pandemic affected access to education. The scholastic year has been completely disrupted when schools were

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<https://education.gov.mt/en/resources/Documents/Policy%20Documents%202014/BOOKLET%20ESM%202014-2024%20ENG%2019-02.pdf>

ordered to shut down in March 2020. This has led to a shift in online learning. However not all educators and students were equipped for this shift. This is due to issues such as limited access to good quality internet, or the absence of a laptop especially in the case of primary school children and students with less privileged backgrounds. In addition, certain examinations were postponed or even cancelled. Some educators changed the format of their examination to an assignment-based exam. Finally, another important impact of COVID is the millions of euros in losses that private schools and English-learning Teaching schools have incurred. Based on the challenges, opportunities, and COVID-19 impact, a number of policy considerations have been identified. Based on these policy considerations, the overarching recommendations are established in Chapter 5.

**Table 3.3 Education Challenges, Opportunities and Policy Considerations**

<b>Challenges</b>	<b>Opportunities</b>	<b>Policy Considerations</b>
High Rate of Early School Leavers compared to EU average (exceeding EU2020 targets)	Low rate of NEET for age group 25-34 compared to EU average.	1. Address the issue of Early School leaving through evidence-based policies tailored for Malta's situation.
High rate of NEET for age group 15-19 compared to EU average.	Higher share of bachelor-level graduates as a percentage of the population, compared to the EU average.	2. Incentivise firms to invest in training for their staff, and measures that encourage people to invest in their skills throughout their career, and beyond.
Low share of masters and doctoral-level graduates as a percentage of the population, compared to the EU average.	Higher employment rates among graduates compared to EU average.	3. Encourage critical thinking among educators.
Adult learning for 25-34 and 55-64 are lower than EU average.	High expenditure on education as a percentage of GDP. Education is "free" up to tertiary levels in Malta.	4. Enhance the quality of vocational training.
		5. Enhance access to education for



<p>Lower quality of vocational training compared to EU average</p> <p>Lower critical thinking in teaching compared to EU-average</p> <p>Lower pupil-to-teacher ratio compared to EU average</p>	<p>Adult learning across all age groups showing an increasing trend overtime in Malta.</p> <p>Skillset of graduates higher than EU-27 average.</p>	<p>persons aged 15-19 who are NEET.</p> <p>6. Promote Masters and doctoral level studies with students who finalized their Bachelor's degree.</p> <p>7. Encourage students to take a teaching degree.</p> <p>8. Reduce the digital divide in education.</p> <p>9. Help private schools and English-learning schools to recover from the impact of the pandemic.</p> <p>10. Ensure the effective implementation of the National Education Strategy and the Higher Educational Strategy.</p>
<p><b>COVID-19 Impact</b></p> <p>Limited access to education and disruption to the educational system.</p> <p>Shift to online learning leading to a possible exclusion of certain groups of society due to a digital divide.</p> <p>Changes in examination format &amp; cancellation of some exams.</p> <p>Lower incomes to private schools and English-learning schools</p>		

Source: Authors

#### 3.2.1.4 Health, Education, and the Human Capital Index

Year on year, the World Bank issues the Human Capital Index (HCI). The Index combines different variables of health and education to provide a benchmark for different countries across the globe. The Index ranges from 0 to 1 and is measured in units of productivity in relation to a benchmark of complete education and full health. The HCI measures the human capital that a child is expected to attain by the time she is 18, taking into consideration the level of education and health status of the country where she lives. “A value of X on the HCI indicates that a child born today can expect to be only (X × 100) percent as productive as a future worker as she would be if she enjoyed complete education and full health” (Kraay, 2019, pg.1).

The aim behind the publication of the HCI is to incentivise governments and policy makers to invest in human capital, even though the returns on such investment may be long-term. Through the HCI, the World Bank aims to raise awareness on the state of a country's human capital and the potential consequences of any human capital shortfalls a country is facing. (Kraay, 2018).

The HCI is made up of three components:

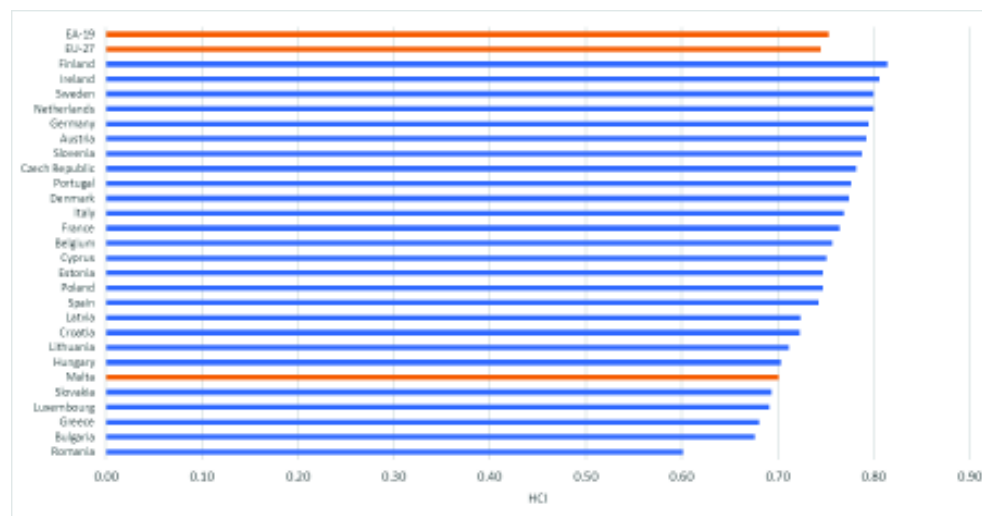
1. **Survival:** This component is measured as the probability of survival to age 5;
2. **School:** This component is measured by the combination of two measures. First, a measure of the number of years of school a child born today can expect to attain given prevailing enrolment rates. Second, a measure of equality of education based on student achievement tests;
3. **Health:** This component is measured through two proxies - the childhood stunting rates and adult survival rates. While this is the formal measure, the actual measures for developed countries takes into consideration only the adult survival rates. This is based on the fact that stunting of children is an indication of pre-natal and infant health which is not an issue in developed countries. Survival rates represent the share of 15-year olds who survive until the age of 60.

Based on the above components, stark differences in the HCI are apparent especially between developed and developing countries. These differences are likely to have serious repercussions on the productivity of the next generation of workers. For example, in developed countries, the probability that a child survives beyond the age of 5 is much higher than in relatively poor countries. Moreover, compared to poorer countries children in developed countries are more likely to complete their formal 14-year education cycle, the quality of education is likely to be better too. Finally, from a health perspective, when a person reaches the age of 18 in a developed country, he/she is likely to have better health levels compared to a person living in a developing country.

In this report we use the HCI to analyse Malta's situation vis-à-vis the EU-27 and EA-19 averages. From all 157 countries assessed for the HCI, Malta ranks 39<sup>th</sup> place and 22<sup>nd</sup> from the EU-27 countries. [Chart 3.22](#) illustrates the latest results of the HCI Index as at October 2018. The results show that Malta's index is on the low end (0.74) compared to other EU countries, the Index for Malta is even lower than the EA-19 (0.75)

and EU-27 (0.74) averages. In Malta, a child born in 2018 will be 74% as productive when she/he grows up as the same child could be if he enjoyed 100% health and education.

**Chart 3.22 HCI Index, 2018**



*Source: World Bank (2020)*

The Index is lower for both males and females. [Table 3.4](#) below shows that the only component in which Malta exceeds the EU-27 average for both males and females is the adult survival rate. Data shows that 95% of the 15-year-olds in Malta are likely to survive until the age of 60, compare to 92% in EU-27 and EA-19. For men, the rate is 93% in Malta compared to 89% in EA-19 and 88% in EU-27. For females the rate is 96% in Malta, compared to 95% in EA-19 and EU-27. The probability of survival to age 5 is convergent with the EU-27 and EA-19. These findings are in line with the healthy and total life expectancy data analysed in the health section (See section 3.2.1.2).

The data shows that the expected years of schooling between age 4 and 18, for a child residing in Malta stands at 13.3 years, lower than the EA-19 and EU-27 averages which stand at 13.45 and 13.39, respectively. The rate for Malta is mainly brought down by males as the years of schooling for females in Malta exceeds the EA-19, and EU-27 averages. Harmonised test scores for both males and females are lower. To this end, when looking at learning-adjusted years of school which represents an indicator of what students learn, the years of school for Malta go down to 10.1 years, compared to

11.2 years in the EA-19 and 11.3 years in the EU-27. This component is lower for both males and females.

**Table 3.4 HCI Index Components**

HCI Components	Malta			EA-19			EU-27		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
<i>Probability of Survival to Age 5</i>	0.99	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
<i>Expected Years of School</i>	13.30	13.00	13.60	13.45	13.35	13.43	13.39	13.30	13.39
<i>Harmonized Test Scores</i>	474.00	467.00	483.00	516.27	513.71	518.92	514.60	511.92	517.38
<i>Learning-Adjusted Years of School</i>	10.10	9.70	10.50	11.20	10.97	11.15	11.30	10.89	11.15
<i>Adult Survival Rate</i>	0.95	0.93	0.96	0.92	0.89	0.95	0.92	0.88	0.95
<b>HUMAN CAPITAL INDEX</b>	<b>0.70</b>	<b>0.67</b>	<b>0.73</b>	<b>0.75</b>	<b>0.73</b>	<b>0.77</b>	<b>0.74</b>	<b>0.72</b>	<b>0.77</b>

*Source: World Bank (2020)*

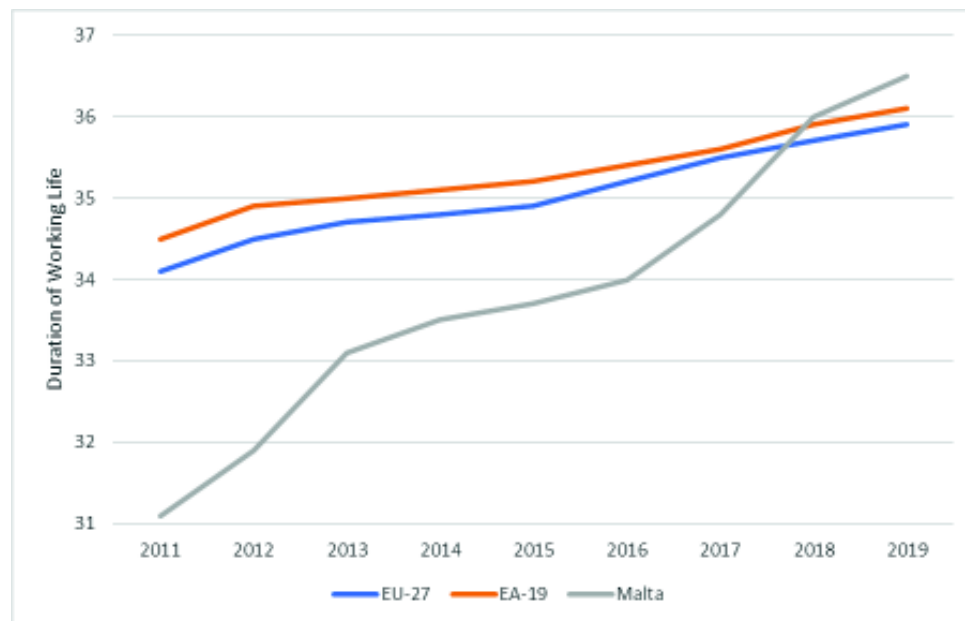
Overall, these outcomes show that Malta seems to be performing well from the health perspective. However, there seems to be challenges from an educational perspective in order to be able to converge with the EU and EA countries. It is important to note that while the HCI is a valid and robust measure of the quality of human capital in a country, the measure is not exhaustive, and it has several limitations. First, the underpinning theory of the index is human capital theory which stipulates that education determines productivity of labour and earnings. However, the relationship between education and productivity is complex and the measures available to date do not cater for this complexity (Marginson, 2019). Second, education data is fragmented, based on different assumptions and measures, and therefore the data may not be precise. Third, educational systems across the world are heterogeneous and therefore standardising these systems under one measure may not lead to precise outcomes (Edwards, 2018). Fourth, various other indicators outlined above are missing such as expenditure on education, lifelong learning, number of graduates, and so on. This means that while the outcome of HCI should be taken seriously, policy makers have to interpret this index with caution and should look at other data that helps understand the level of quality and quantity of education (See section 3.2.1.3).

### 3.2.1.5 Labour Market Trends

As indicated in the macroeconomic analysis, Malta's labour market situation, pre-COVID was close to full-employment, while unemployment rates being among the lowest in the EU. The economic growth generated throughout the past years led to a constant increase in labour market opportunities and in labour demand. As indicated in this section this has not only led to an influx of foreign workers, but it changed the labour market dynamics in terms of female participation rates and duration of working years. These elements have contributed to economic growth.

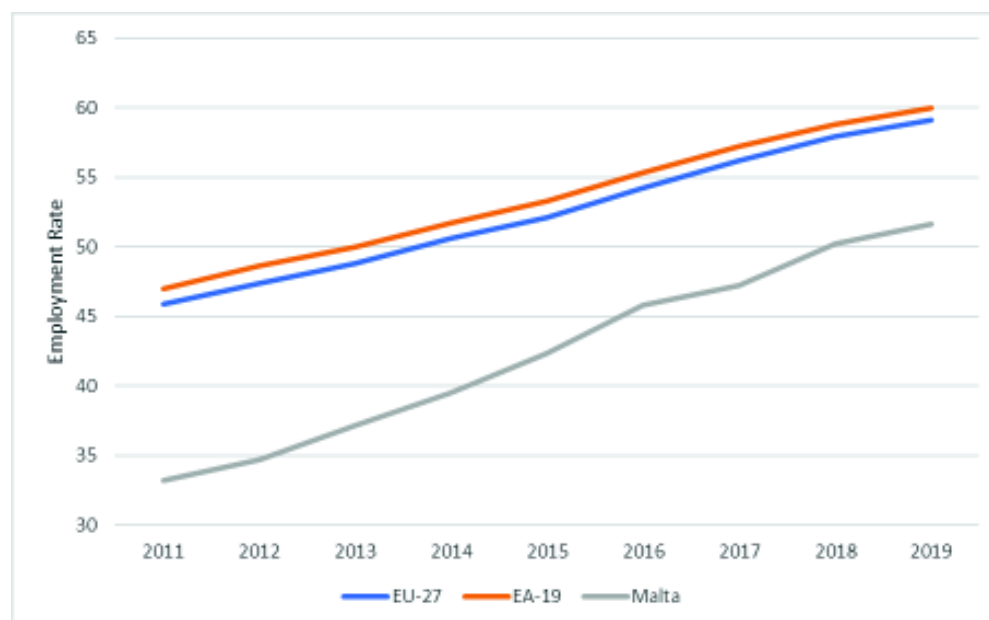
**Chart 3.23** shows that since 2011 there has been a significant increase in the working life years in Malta. In 2011, on average, workers in Malta had a working life of 30 years, much lower than the EA-19 and EU-27 averages (34 years). By 2018, the duration of working life in Malta exceeded EU average. In 2019, the figure increased to 37 years in Malta compared to the EA-19 and EU-27 averages of 36 years. The increase in working years in Malta is reflected in the higher employment rate among workers aged between 55 and 64. While the employment rate for this age cohort in Malta remains below EU-27 and EA-19 averages, there has been a significant increase in Malta, from 33% in 2011 to 52% in 2019 (See chart 3.24). The rate is expected to reach 70.1% by 2070 (Commission, 2018).

**Chart 3.23 Duration of Working Life**



Source: Eurostat (2020)

**Chart 3.24 Employment Rate of Persons Aged 55-64**



*Source: Eurostat (2020)*

These trends could be partly attributed to a scheme was introduced over the past years whereby persons who reach the Maltese retirement age can remain in employment while they receive their pension, irrespective of the income from employment.

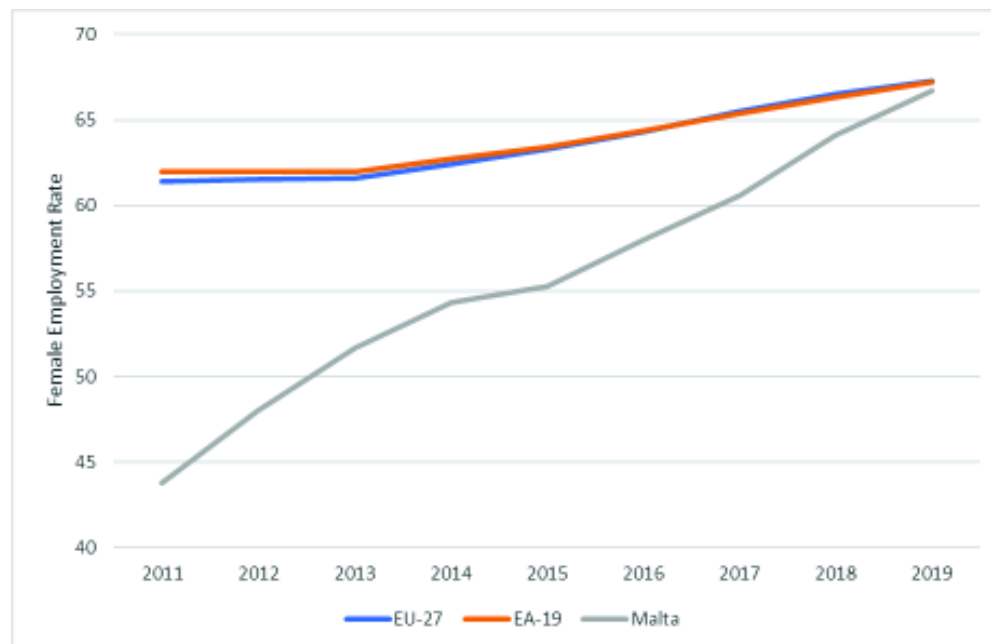
Another element which is likely to have contributed to some extent to economic growth is the increase in female participation. Since 2011, the gap between EU averages and Malta with respect to female participation has narrowed drastically as illustrated in [chart 3.25](#). In Malta the female participation rate in 2011 stood at 41.6% compared to 61% in EU-27 and EA-19 countries. By 2019, the rate in Malta increased to 66.7%, in line with EU-27 and EA-19 countries which registered an average rate of 67.3% and 67.2%, respectively. This increase is mainly a result of the increasing opportunities in the labour market, but also as a result of measures that are family friendly and promote work-life balance, mainly the free childcare scheme<sup>44</sup>. The increase in female participation is likely to enhance the quality of human capital in the market as the number of females graduating at bachelor, masters, and even doctoral levels are higher compared to males as indicated by Eurostat data.

<sup>44</sup> <https://education.gov.mt/en/Pages/Free-Childcare.aspx>

The increase in female participation and increase of the participation of older workers are crucial especially when considering that the working-age population (20-64 years) is expected to decline from 61% in 2016 to 46% by 2070. However, the participation rates are expected to continue increasing from 69% in 2016 to 80% in 2070, the employment rate is expected to increase from 66% in 2016 to 74% in 2030. Coupled with an increase in pensionable age, these trends could help in overcoming the reduction in the working-age population (Commission, 2018).

Across all EU countries, Malta has the highest employment gap between men and women. In 2019, the gap in Malta stood at 20 percentage points, compared to 11 and 11.7 percentage points in EA-19 and EU-27, respectively (See chart 3.26). In line with this argument, it is worth noting that while the gender pay gap has increased throughout the years, 7.7 in 2011 to 11.7 in 2018, the gap remains lower than the EU-27 and EA-19 which amount to 14.8 and 15.9, respectively.

**Chart 3.25 Female Participation Rates**

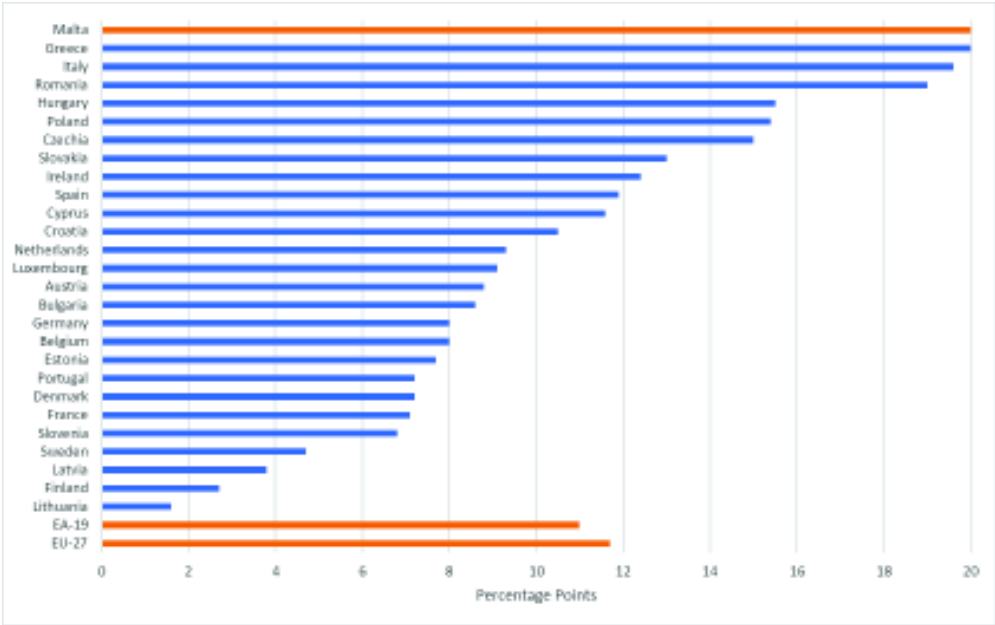


Source: Eurostat (2020)

This high gap is likely to be due to the very low female participation rates for the age cohort 55-64 in Malta (36%), compared to the levels in the EA-19 (54%) and EU-27 (53%) (See chart 3.27). The gap is also due to the high rate of male employment

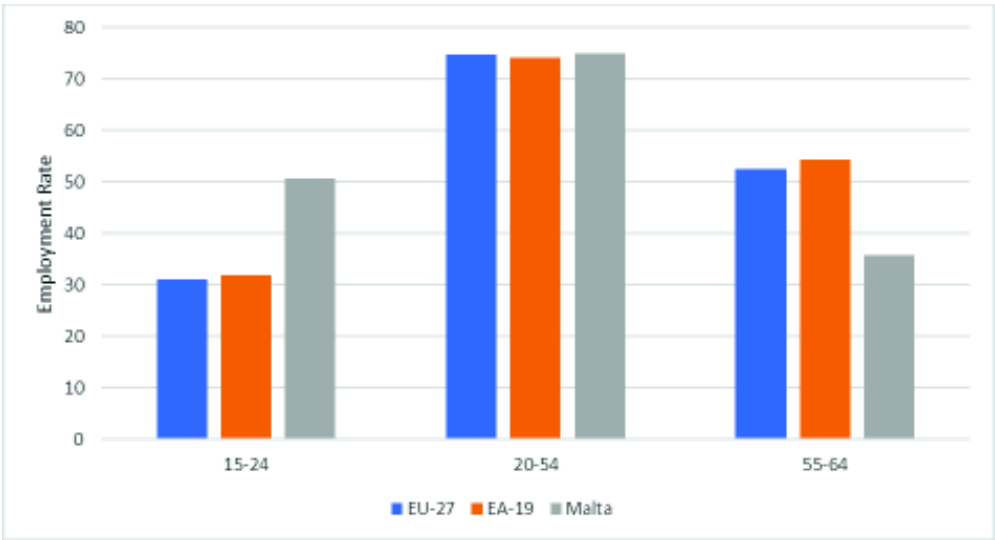
across all age cohorts, especially compared to EU averages (See chart 3.28). Female employment rates are higher than EU average only in the 15-24 age cohort. Thus, there seems to be a challenge in retaining females employed beyond the age of 24.

**Chart 3.26 Gender Employment Gap, 2019**



Source: Eurostat (2020)

**Chart 3.27 Employment Rates by Age, Females, 2019**

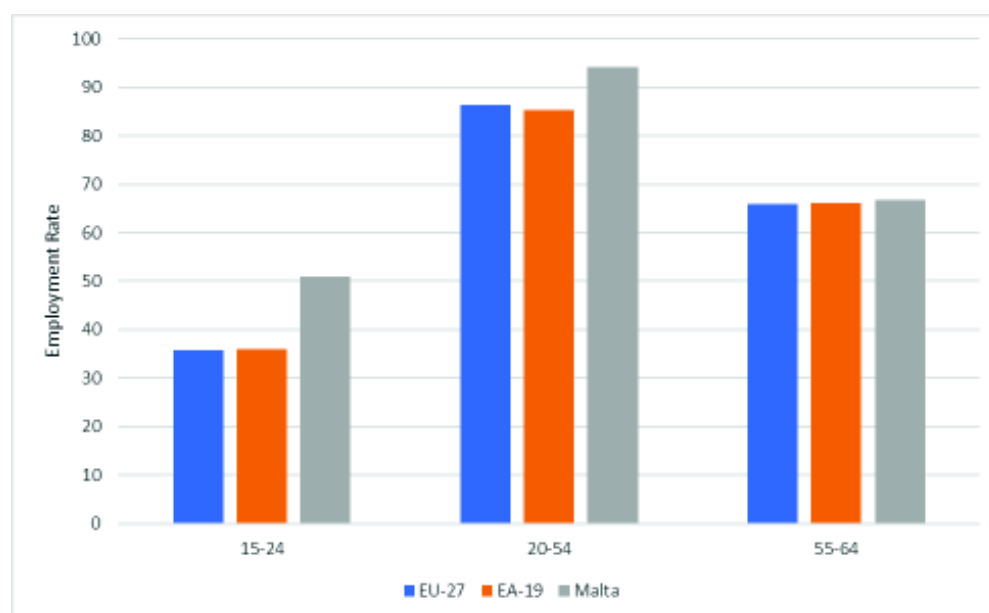


Source: Eurostat (2020)



While the supply of labour has increased, the labour market pre-COVID-19 was characterised by increasing labour shortages. In view of these labour shortages, according to a skill-gap study conducted in Malta, the hardest vacancies to fill include clerical support workers, and service and sales workers, and plant and machine operators and assemblers. The main reason for the shortages in these areas has been attributed to lack of skills. The sectors that find it hard to fill vacancies include mining and quarrying, manufacturing, electricity, gas steam and air conditioning supply, water supply, sewerage, waste management, followed by the financial and insurance activities sector (Jobsplus et al., 2017). These shortages could be attributed to factors which determine competitiveness, the cost and quality of labour. Sectors such as manufacturing, and mining and quarrying may attract less workers as they pay lower wages in comparison to other sectors. On the other hand, sectors such as financial services may experience issues with finding people as a result of skill mismatches (NSO, 2019).

**Chart 3.28 Employment Rates by Age, Males, 2019**



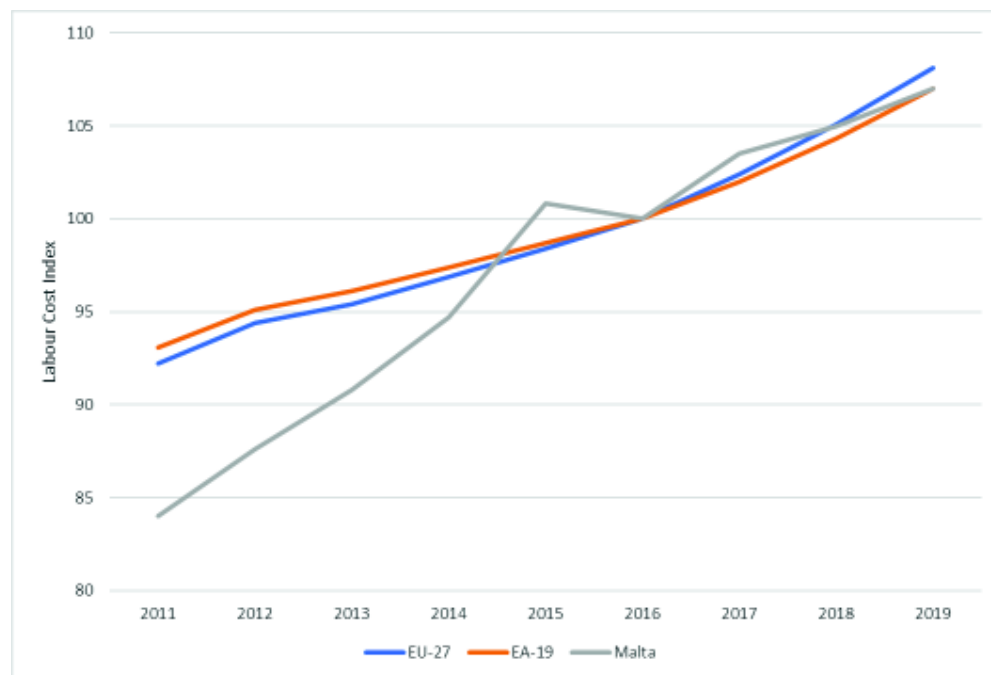
Source: Eurostat (2020)

While the increasing participation rates discussed above are important to increase economic growth, the competitiveness of a country goes beyond the increase in quantity of labour, it depends on the cost and quality of labour.

The cost of any factor input relative to a country's general competitiveness is a crucial factor which determines the attractiveness of a country. A country may be highly competitive but not entirely attractive if the costs of inputs including labour is too high. "Countries with low factor costs relative to foundational competitiveness (e.g., China) will be more attractive for investment and should experience more rapid growth, while countries with high costs (e.g., Greece) relative to competitiveness may find sustaining levels of prosperity challenging" (Delgado et al., 2012, pg. 13).

The Labour Cost Index is considered to be the main indicator in comparing the labour costs of a country. Data in relation to this Index shows that over the years, the cost of labour in Malta has increased in a consistent manner since 2011 where the index stood at 84 to 107 in 2019. In 2011, the index for the EA-19 and EU-27 were higher than that of Malta, at 93.1 and 92.2, respectively. Compared to the EA-19 and EU-27 averages, between 2011 and 2014, the cost of labour was more competitive as compared to the period post 2014. On average, for 2019 the Index for Malta was in line with the EU-27 (108.1) and EA-19 (107) values (See chart 3.29).

**Chart 3.29 Labour Cost Index (2016=100)**

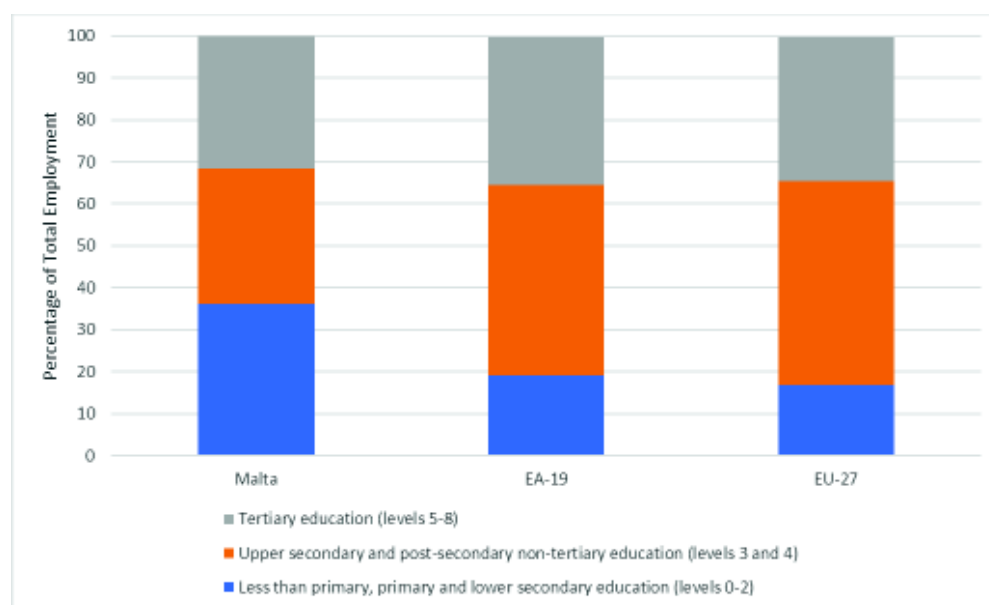


Source: Eurostat (2020)

While cost is an important determinant for the attractiveness and competitiveness of a country as outlined in the previous section, so is the quality of labour. An important determinant of the quality of labour is the educational levels of the labour force. **Chart 3.30** shows that among persons aged 15-64, Malta exceeds EU-27 and EA-19 averages with regards to the share of people with low levels of education (0-2), with the rates registered at 36.1%, 16.9% and 19.1%, respectively. Employees with moderate qualifications (levels 3-4) in Malta make up 32.4% of the workforce while the rates for EU-27 and EA-19 are 48.4% and 45.3%. Finally, employees with a tertiary level of education in Malta represent 31.5% of total employment, compared to the rates at an EU-27 and EA-19 level which were registered at 34.5% and 35.3%. This data shows that the biggest challenge for Malta is to increase employees from primary and lower secondary educational levels to upper secondary and post-secondary levels.

When looking at trends overtime there seems to be an improvement in this regard. Between 2011 and 2019, the share of persons employed in Malta with levels 0-2 of education declined by 3.6% on average, the share of persons employed with levels 3-4 of education increased by an average rate of 1.5%, while those with a tertiary level of education increased by an average rate of 4.3% (See chart 3.31).

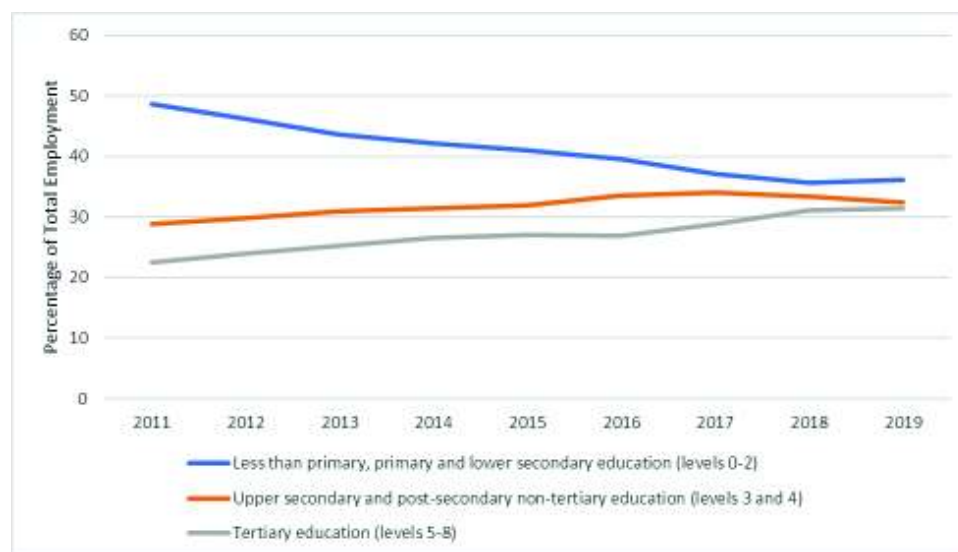
**Chart 3.30 Labour Force by Qualifications, 2019**



Source: Eurostat (2020)

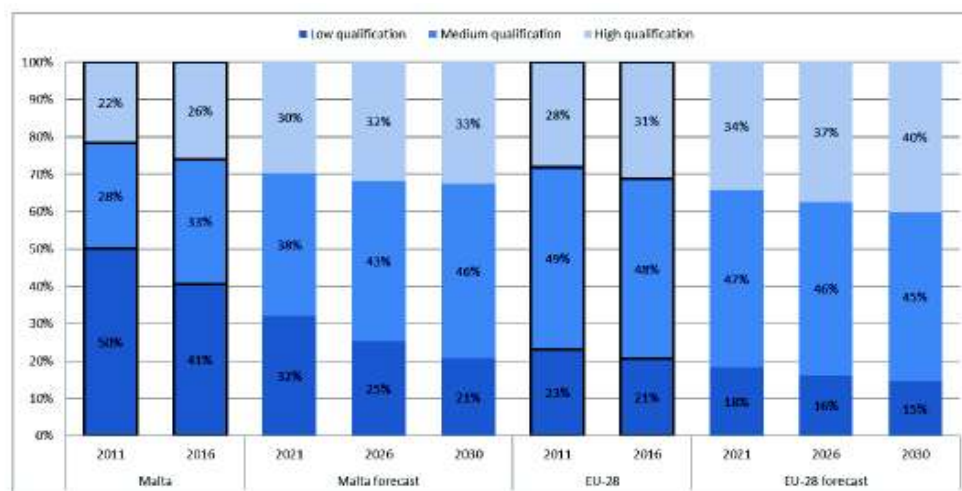
Despite these improvements, a publication by the European Centre for the Development of Vocational Training (Cedefop) shows that by 2030 the share of employment with tertiary level of education in Malta (33.0%) will be lower than the EU average (40.0%). However, the share of persons with basic levels of education is expected to decline drastically by 2030 in Malta to 21.0%, closer to the EU average of 15%. On the other hand, the share of employment with upper secondary and post-secondary qualifications is expected to increase to 46.0% in Malta by 2030, higher than the EU average of 45% (See chart 3.32). These developments are reflected in the share of job openings expected (See chart 3.33). While Malta is expected to have higher levels of job openings compared to EU requiring basic education, the share of job openings for medium-level educations will be in line with EU average. On the other hand, job openings for tertiary level education are significantly higher within the EU. Jobs requiring tertiary level of education are important to enhance productivity and also competitiveness, and thus these forecasts highlight the challenge that Malta will be facing in this regard.

**Chart 3.31 Labour Force by Qualifications in Malta**



Source: Eurostat (2020)

**Chart 3.32 Labour Force by Qualifications 2016-2030**



Source: Cedefop (2020)

**Chart 3.33 Share of Total Job Openings 2016-2030**



Source: Cedefop (2020)

Other indicators of labour quality are based on data gathered by the World Bank for the Global Competitiveness Index (See chart 3.34). The variables highlighted in the chart fall under the 8<sup>th</sup> pillar of the GCI – labour. From all 141 countries, Malta ranks

31 with respect to labour quality. We use the score<sup>45</sup> to illustrate the progress for Malta, EU-27, and EA-19.

The overall labour Market indicator shows the extent by which human resources can be re-organised and leveraged. The overall score for Malta is 67, slightly higher than the EA-19 and EU-27 averages. In terms of progress score, Malta exceeds the latter two averages in all variables, except for the gender employment gap and reliance on professional management. The former is explained above in this section, with respect to the latter one could deduce that meritocracy in small states tends to be more challenging compared to larger countries. Still, the gap between Malta and EU averages in this case is still not very wide.

Significant gaps between Malta and EU and EA exist particularly in terms of labour tax rate and redundancy costs. In these cases, Malta scores significantly better than other with regards to the former, Malta is known to have lower labour tax rates compared to other countries, even though this rate has slightly increased over the recent years. Redundancy costs are also lower (7 weeks), especially compared to countries known to have high redundancy costs such as France (13 weeks).

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<sup>45</sup> The GCI 4.0 introduces a new progress score ranging from 0 to 100. The frontier (100) corresponds to the goal post for each indicator and typically represents a policy target. Each country should aim to maximize its score on each indicator, and the score indicates its current progress against the frontier as well as its remaining distance. This approach emphasizes that competitiveness is not a not a zero-sum game between countries—it is achievable for all countries.

**Chart 3.34 Indicators of Labour Quality (Progress Scores), 2019<sup>46</sup>**



Source: WEF (2020)

**Table 3.5** highlights the challenges and opportunities that emerged from the analysis in this section. In line with NSO data, the Table also highlights the main impact of COVID-19 on the Maltese labour market. Based on the outcomes, the labour market policy considerations are outlined, these will be used when constructing the overarching recommendations in Chapter 5.

**Table 3.5: Labour Market Challenges, Opportunities and Policy Considerations**

Challenges	Opportunities	Policy Considerations
Highest employment gap between males and females across the EU.	Increase in duration of working life, higher than EU average.	1. Reduce the employment and wage gap

<sup>46</sup> Internal labor mobility and Workers' Rights were excluded due to missing values and ranks with respect to these two variables.

<p>Low female participation for the age cohort 55-64, compared to EU-average.</p> <p>Labour shortages attributed to lack of skills in sectors including manufacturing and financial services.</p> <p>Compared to the EU average, Malta has workforce that has a low share of upper secondary and tertiary education.</p> <p>Working age population is expected to decline.</p>	<p>Increase working age population by attracting foreign workers.</p> <p>Increase in employment rate of persons aged 55-64, still below EU average. The rate is expected to continue increasing.</p> <p>Low unemployment levels, compared to EU average.</p> <p>Increase in female participation rates.</p> <p>Lower labour costs compared to EU averages.</p> <p>The share of workers with upper secondary education is expected to reach EU average by 2030.</p> <p>The share of job openings expected in the coming years requiring tertiary education is lower than the EU average.</p> <p>On average, labour costs, redundancy costs, flexibility in wage determination, active labour market policies in Malta are better than the EU average.</p>	<p>between males and females.</p> <ol style="list-style-type: none"> <li>2. Continue increasing the female participation rate, with specific focus on the 55-64 age cohort.</li> <li>3. Enhance work-life balance and family-friendly measures.</li> <li>4. Enhance the skills of the workforce through education, and on- and off-the-job training.</li> <li>5. Balance economic development with labour costs.</li> <li>6. Ensure the continuation of effective implementation of the active labour market policies.</li> <li>7. Enhance attractiveness for talented migrants.</li> <li>8. Enhance working life.</li> <li>9. Review laws and</li> </ol>
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### **COVID-19 Impact<sup>47</sup>**

During the last two weeks of March, 59 per cent of persons who had a job felt that their employment was affected with the onset of COVID-19.

Almost 30 per cent of the employed were not working during the last two weeks of March despite having a job.

One of the major changes experienced by the employed was a reduction in the number of working hours or complete absence from work.

The average actual number of hours worked per week decreased from an annual average of 37 hours in 2019 to a mean 23 hours during the second half of March 2020.

Almost 80 per cent of employed persons worked less hours than usual due to slack work.

Over one third of those employed in the last two weeks of March were working from home.

regulation with regards to remote working.

10. Promote remote working.

*Source: Authors*

### **3.2.2 Physical Infrastructure**

Physical infrastructure refers to transport and utility infrastructure. For decades, economic research has shown that infrastructure has important implications on national competitiveness. Still, the magnitude of this effect remains unknown to date (Delgado et al., 2012). Investment in quality infrastructure and infrastructure management allows countries to provide the basic utilities efficiently namely electricity and water. This investment also enhances connectivity, lower transport costs, and design industrial policies and expand industry development which in turn lead to enhanced competitiveness (Palei, 2015).

The quality of infrastructure is assessed through Pillar 2 of the Global Competitiveness Index. From all 141 countries, Malta ranks 47<sup>th</sup> in the overall infrastructure quality measure, with an overall score of 82. Compared to other EU-27 and EA-19 countries, Malta's score is substantially lower in road connectivity, airport connectivity, and

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<sup>47</sup> Based on NSO data:

[https://nso.gov.mt/en/News\\_Releases/Documents/2020/05/News2020\\_077.pdf](https://nso.gov.mt/en/News_Releases/Documents/2020/05/News2020_077.pdf)

slightly lower with regards to reliability of water supply and electricity quality. These areas have been put under increasing strain especially due to the influx of migrant workers. The strain with regards to road connectivity will push transport costs up, influencing business productivity and public health.

Various projects are ongoing to improve both air and road connectivity. With regards to road connectivity, over the past years various projects have been going on involving investment in arterial roads and residential roads. In 2019, Infrastructure Malta launched a €64 million project over 14 different projects that aim to enhance Malta's road network. Also, in 2019, Infrastructure Malta launched a seven-year plan of €700 million for residential roads. These projects are partly funded by the EU. Prior to these investments, other upgrades were made to enhance Malta's TEN-T core network amounting to approximately €50 million between 2014 and 2019. In addition, studies are underway for a mass transit system and the Malta-Gozo tunnel.

With regards to air connectivity, through the SESAR Deployment Programme, Malta benefitted more than €7 million in EU funds to improve air traffic management systems and air connectivity across the EU. Having said this, Malta has a high air passenger rate per capita, higher than EU average, reflecting Malta's high rate of tourism (Böwer, Salas, & Ugazio, 2018).

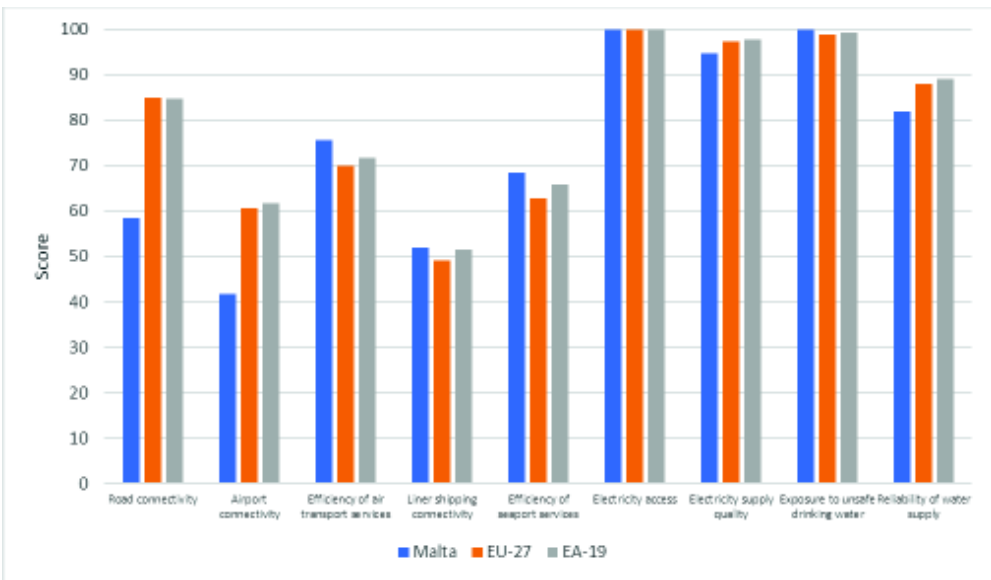
With regards to the supply of water, government launched a project in 2019, project RainWiiN (RainWater Integrated Infrastructure Network), which includes action plans to establish an infrastructure for the management of rainwater in five areas in Malta and Gozo. A pilot project will also take place which is bound to increase water storage by 45,000 cubic meters.

Finally, with regards to electricity quality, various investments have taken place over the years to reduce fossil fuel dependence, improve energy security, and enhance energy diversification. These include the Malta-Sicily interconnector cable, the new gas-fired power unit, and the conversion of the existing plant from heavy fuel to natural gas, supported by an LNG terminal. Other investments are ongoing or in the pipeline such as the gas pipeline and continuous investments to shift to renewable energy (Böwer et al., 2018). The interconnector and gas-fired electricity generation together with the decommissioning of the Marsa fuel power station are expected to enhance long-term output through a reduction in marginal costs (Rapa, 2017). In 2018, a 120

MW steam plant was composately demolished, this leaves the fossil fuel generation to date mainly based on natural gas.

Malta on the other hand scores slightly higher in the efficiency of transport services, linear shipping connectivity, efficiency of seaport services, and quality of drinking water. Access to electricity is at a score of 100 across the board (See chart 3.35). Despite the relatively good infrastructure in this area, various project to enhance efficiency of transport and seaport services are in the pipeline or ongoing. These include the Moreover, investment in a new reverse osmosis plant in Hondoq ir-Rummien was announced which will improve the quality of drinking water.

**Chart 3.35 Indicators of Infrastructure (Progress Scores), 2019**



Source: WEF (2020)

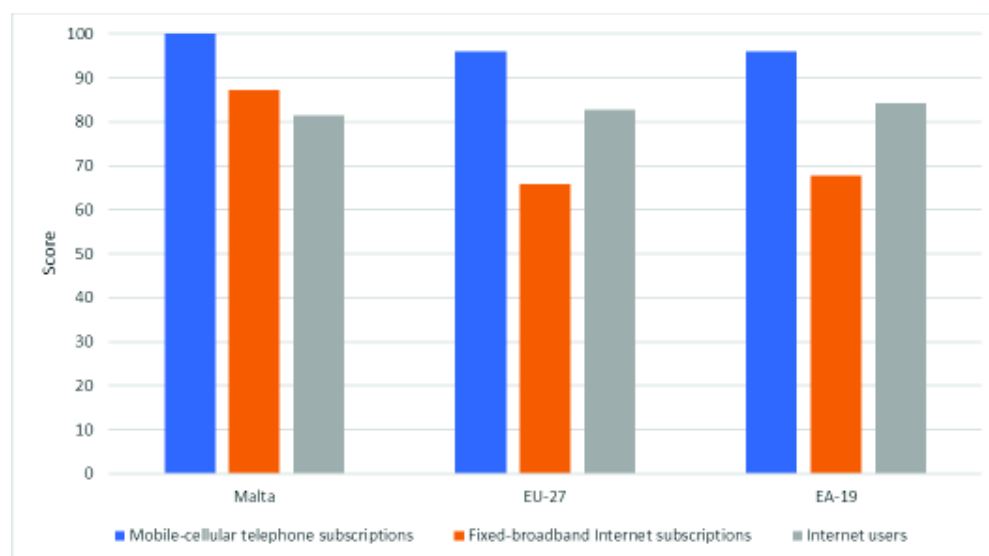
In line with transport, water, and electricity investments, a number of physical infrastructure investments are ongoing or in the pipeline for Malta.

Based on the above analysis, the strengths, weaknesses, and targets are highlighted in table 3.6. The targets are based on an IMF report which focused on Malta's investment gap by Böwer et al. (2018). The targets are essential because as highlighted in the study, increased public investment is essential for GDP growth. The report highlights that the low public capital stock and public investments, compared to the EU average, may limit Malta's future growth potential. Model simulations indicate

a temporary increase in public investment over 7 years, would increase the net present value of GDP by around 5.25% -8% of GDP over 30 years, depending on the efficiency levels of spending. A permanent increase in public investment would increase the net present value of GDP by around 12-18.25% of GDP over 30 years, depending on the efficiency levels of spending.

The determinant of the quality of infrastructure in a country is the investment in ICT infrastructure. Malta ranks 25<sup>th</sup> from a total of 141 countries with regards to the overall infrastructure quality. With a score of 75, Malta exceeds the EA-19 and EU-27 average scores which amount to 72. The scores for all three indicators for Malta almost reach 100, significantly higher than the EA-19 and EU-27 averages (See chart 3.36).

**Chart 3.36 Indicators of ICT Infrastructure Quality (Progress Scores), 2019**



Source: WEF (2020)

These developments have been acknowledged by the ICT Development Index, whereby Malta ranks 32nd from a total of 173 countries. From all countries, in 2019, Malta ranked 32nd in fixed broadband basked 5GB, 35th in mobile cellular basked low usage, 43rd in data-only mobile broadband, 56th in low usage and data basket, 55th in high usage and data basket. In fact, the country report stipulated that “Over the past decades, Malta has developed into one of the EU’s most advanced telecommunication markets. ICT household penetration is similar to the European average and more than two-thirds of the population are using the Internet. Malta’s Digital Strategy puts the

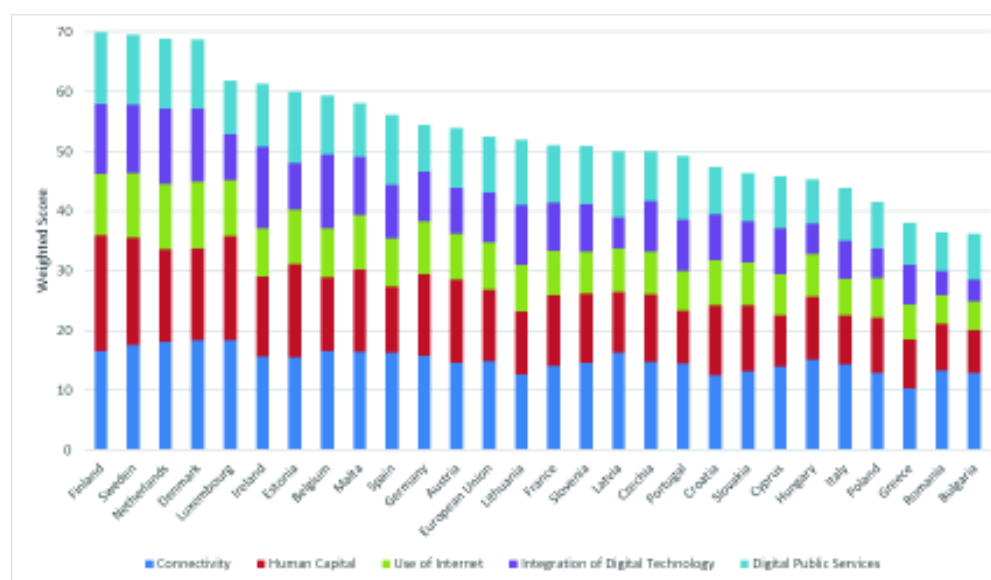
country on the road to continue this development, by further investing in fixed- and mobile-broadband infrastructure and creating a competitive environment (Sanou, 2018, pg. 110).

In line with these developments, Malta also exceeds the EU average and stands with the top EU-27 10 countries with regards to the Digital Economy and Society Index (See [chart 3.37](#)). Malta exceeds the EU average with respect to all indicators except in the case of digital public services where the weighted index is slightly lower. However, the quality of ICT infrastructure is bound to improve in the public service as government announced a €40 million investment announced in 2017 in the public sector, partly financed by the EU. The investment includes €9 million euro for eHealth a national online health infrastructure, €12 million for the government's accounts system, €10 million for better ICT systems for customs, tourism, national security, justice, and social services, and €8.5 million for the infrastructure at the Malta Information and Technology Authority.

It is important to note that while The DESI report indicated that ICT skills in Malta are beyond the EU-28 average, there are significant challenges associated with ICT and digital skills in among the Maltese population. In fact, Malta tends to rely on foreign workers to address the digital skills gap in the country. In fact, a report published by eskills Malta finds that 50% of Malta's job opportunities in tech-related sectors rely on the skills of foreign workers (eSkillsMalta, 2017).

Based on the analysis in this section, the challenges, and opportunities for infrastructure in Malta are outlined, as seen in [table 3.6](#). The COVID-related challenges on infrastructural investment are also highlighted. Based on these outcomes, the area specific policy considerations have been identified which will serve as the foundation for the overarching recommendations.

**Chart 3.37 Digital Economy and Society Index (DESI), 2019**



Source: European Commission, Digital Scoreboard (2020)

**Table 3.6 Infrastructure Challenges, Opportunities and Policy Considerations**

Challenges	Opportunities	Policy Considerations
Lower road connectivity, compared to EU average.	Increase in physical infrastructure investment across all sectors.	1. Promote private sector investment.
Lower air connectivity, compared to EU average.	Ongoing projects to enhance air and road connectivity.	2. Reallocating public expenditure, from current to capital investment.
Low reliability of water supply, compared to EU average.	High linear connectivity shipping, compared to EU average.	3. Enhancing public spending efficiency, budget neutral approach.
Low reliability of electricity supply quality, compared to EU average.	High efficiency of seaport services, compared to EU average.	4. Improved use of EU funds, public-private partnerships linked with the new Malta Development Bank, as

<p>Low levels of public service ICT infrastructure, compared to EU average.</p> <p>Digital skills gap.</p>	<p>Access to electricity and drinking water.</p> <p>Shift from heavy-fuel oil to gas for electricity generation.</p> <p>Increased diversification of investment related to electricity supply sources.</p> <p>Ongoing investment in public service ICT infrastructure.</p> <p>Digital infrastructure is in good shape.</p>	<p>well as savings from spending reviews would facilitate a budget-neutral investment push.</p> <p>5. Facilitate the attraction of foreign workers that have high digital and ICT skills.</p> <p>6. Improve education and training of ICT and digital skills of Maltese workers.</p> <p>7. Ensure the effective implementation of the public service ICT infrastructure funds.</p> <p>8. Ensure the constant update of the national ICT infrastructure.</p> <p>9. Ensure constant firm human and capital investment in ICT and digital infrastructure.</p>
<p><b>COVID-19 Impact</b></p> <p>Certain projects may be postponed, especially in the private sector.</p> <p>Banks may be more cautious as a result of the economic impact of the crisis.</p>		

*Source: Authors*

### 3.2.3 Ease of Doing Business

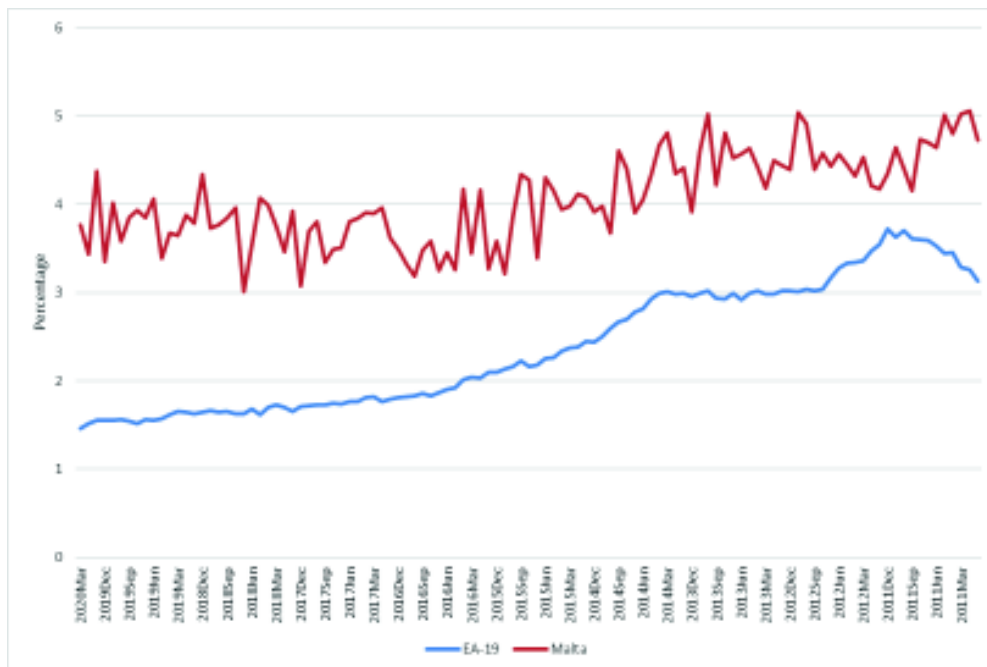
In order to enhance competitiveness, countries need to ensure that access to capital markets and administrative practices are as efficient as possible. These factor inputs enables new business formation and productivity (Delgado et al., 2012).

### 3.2.3.1 Access to Capital

There are indicators to assess access to capital. An important indicator is the Credit Rating of a country. The credit rating provides an indication of the credit worthiness of a country. Has an important impact on the borrowing costs of a country. Standard & Poor's credit rating for Malta stands at A- with stable outlook. Moody's credit rating for Malta was last set at A2 with stable outlook. Fitch's credit rating for Malta was last reported at A+ with stable outlook. DBRS's credit rating for Malta is A (high) with stable outlook.

Associated with the credit rating, an important indicator is the cost of borrowing to non-financial institutions. As illustrated in [chart 3.38](#), the cost of borrowing in Malta (3.8% - March 2020) is higher than the EA-19 average (1.5%). Data from the European Central Bank (ECB) shows that Malta (3.8%) has one of the highest rates of borrowing across the EU, three times the rates in the Netherlands (1.0%), Luxembourg (1.1%), and France (1.3%).

**Chart 3.38 Cost of Borrowing, 2011-2020**



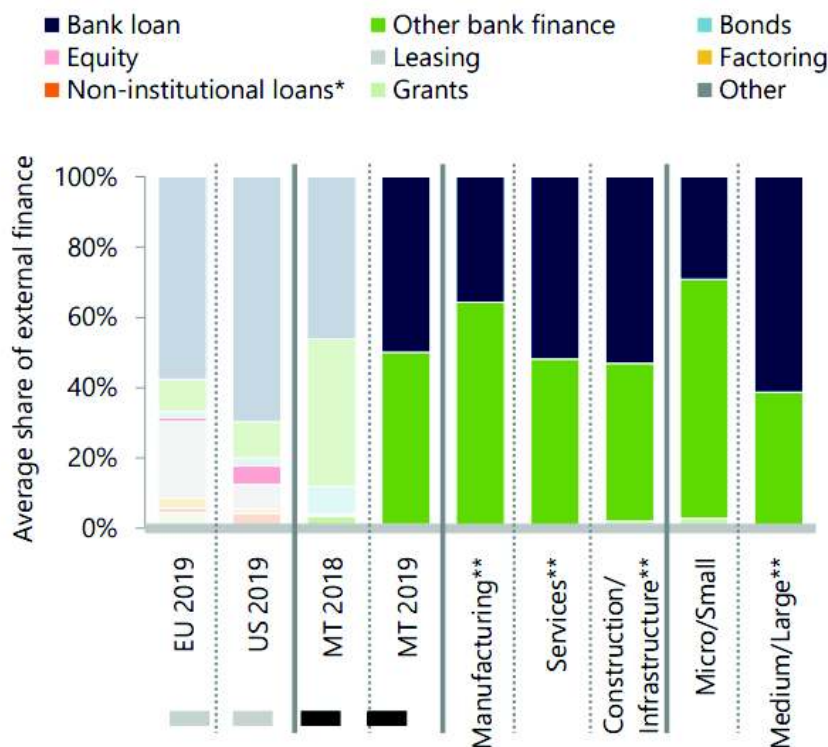
Source: ECB (2020)



Despite the high cost of borrowing, Malta's investment was key to Malta's recent economic success leading to the highest rate of economic growth in the. According to a survey by the European Investment Bank, more than eight in ten firms (84.0%) in Malta invested over the last financial year. Investment was more prominent in the manufacturing, and construction sector. Still, the intensity of investment is slightly below the EU average (85%). Micro and small enterprises are more likely to be dissatisfied compared to medium to large firms (EIB, 2020).

Unlike other EU countries, the sources of borrowing in Malta are not very diversified, lending involve banks, with a limited amount of lending coming from loans (2018) (See [chart 3.39](#)). This could be another determinant of the high cost of borrowing. Together with the high cost of borrowing, the limited lending sources can be regarded as significant barriers to business potential investment.

**Chart 3.39 Source of Lending, 2019**



Source: EIB (2020)

The ease of Doing Business Report (Bank, 2020) and the Global Competitiveness Index (2019) highlight other important indicators that indicate the quality of access to capital. In the former report, Malta ranks, 88 from 190 countries. With regards to the former report, Malta's score<sup>48</sup> is 66, lower than the EU-27 and EA-19 averages of 76. With regards to the latter report Malta ranked 32<sup>nd</sup> from 141 countries when assessing financial systems (pillar 9) overall. The score for Malta in this case is 89, higher than the EU-27 and EA-19 averages of 76 and 82, respectively. This difference is mainly due to the different indicators assessed (See charts 3.40 and 3.41).

An important indicator with respect to access to credit is measured through the Ease of Doing Business Report is the ease of getting credit. From all 190 countries, Malta ranks 144<sup>th</sup> with respect to ease of getting credit, with a score of 35. The score is significantly lower than the EA-19 and EU-27 averages, 56 and 59, respectively (See chart 3.40).

**Chart 3.40 Ease of Doing Business Scores, 2020<sup>49</sup>**



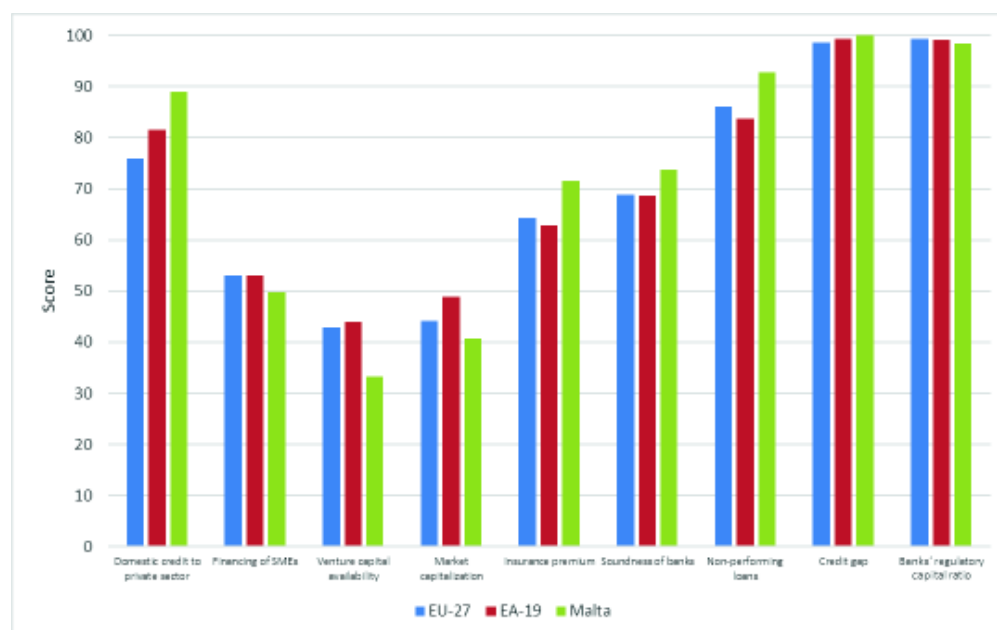
Source: World Bank (2020)

<sup>48</sup> Similar to the GCI score interpretation, the score for the Ease of Doing Business ranges from 0 to 100 where 0 represents the lowest and 100 represents the best performance.

<sup>49</sup> Ease of Starting a business and ease of resolving insolvency are also covered under the GCI, Pillar 11, Business Dynamics.

This outcome is supported by indicators measured through the GCI namely, financing of SMEs and venture capital availability (See chart 3.41). From 141 countries, Malta ranks 62<sup>nd</sup> and 83<sup>rd</sup> in these two indicators, respectively. The score for the former in Malta is 50, compared to 53 for EU-27 and EA-19. The score for the former is 33 in Malta compared to 43 and 44 for EU-27 and EA-19. The low ranks are mainly attributed to legal barriers for businesses and stricter conditions to get credit (Zerafa, 2017).

**Chart 3.41 Financial System Indicators, 2019**



Source: WEF (2020)

According the Ease of Doing Business Report Malta's rank with respect to ease of resolving insolvency in 2019 was 121 from 190 countries. Malta scored (38) significantly below the EU-27 and EA-19 averages (70 and 71, respectively). The low score is mainly attributed to low recovery rates, and a relatively weak framework. It is imperative that Justice reforms take place to support the private sector in this key area (Fabri, Cassar, Fabri, Fenech, & Spiteri, 2020).

Other indicators with regards to the analysis of access to capital are registered though the financial systems pillar of the GCI. Despite the difficulty to access finance for

businesses, Malta has relatively high rates of credit when combining credit to households and firms as a percentage to GDP. Insurance premium volumes as a percentage of GDP is also higher. These indicators show that insurers and financial institutions have confidence in private investment. In turn, private investors have confidence in the banking system as the score for soundness of banks is also higher than that of EU and EA averages. In fact, the IMF reported that the banking system in Malta has been well capitalised over the past years and banking profitability remains strong (IMF, 2020b). This is also confirmed by the fact that the credit to GDP ratio, and bank's capital ratio are in line with EU averages.

Malta also registered a higher score compared to the EA and EU averages in terms of non-performing loans. Eurostat figures show that the gross non-performing loans as a percentage of gross loans declined from 6% in 2014 to 3.1% in 2018<sup>50</sup>. Malta's situation is also in line with EU and EA averages in terms of the credit gap and the banks' regulatory capital ratio.

The inefficiencies outlined in this section especially with regards to credit access and insolvency may also be leading to high costs of borrowing. However, despite its limitations, there are various aspects in which the financial system is functioning adequately.

### **3.2.3.2 Quality of Administrative Practices**

The Ease of Doing Business Report also highlights important indicators with respect to efficiency of administrative practices. In this case there are areas where Malta, in terms of score, slightly exceeds EU-27 and EA-19 averages such as the ease of dealing with construction permits, and ease of enforcing contracts. The ranks for Malta for these two indicators are 74 and 68, respectively. Ranking 66<sup>th</sup>, in the area of minority investor protection, Malta's score is in line with EU averages. On the other hand, Malta scores lower than EU-27 and EA-19 averages in indicators such as ease of starting a business, ease of getting electricity, ease of registering property, ease of paying taxes,

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<https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tipsbd10&plugin=1>

and ease of trading across borders. The ranking for these indicators is 86, 73, 152, 78, and 48, respectively.

In an effort to reduce these administrative burdens, in recent years the government has appointed a commissioner for the simplification and reduction of bureaucracy. The aim is to reduce administrative burdens for local businesses and also to facilitate the setting up of foreign businesses in Malta. In fact, a total of 500 simplification measures were implemented between 2014 and 2019. In addition, a one-stop-shop service through Malta Enterprise (Business First) was launched in 2017 to address all administrative issues under one roof (Pirrotta & Calleja, 2019). In fact, some administrative practices rankings have seen great improvements. In 2013 of ease of starting a business, ease of getting electricity, ranked 150, 111, respectively.

In line with the analysis of this section, the key challenges and opportunities are outlined together with the potential COVID-19 challenges. Based on these outcomes, a number of policy considerations are outlined to enhance efficiency in doing business (See table 3.7).

**Table 3.7 Ease of Doing Business Challenges, Opportunities and Policy Considerations**

Challenges	Opportunities	Policy Considerations
High cost of borrowing.	High credit worthiness.	1. Continue digitising the financial services sector within a broader digital society that fully harnesses the power of technology;
Limited sources for borrowing.	High confidence of insurers and financial institutions in private investment.	2. Enhance the accessibility to finance through the introduction of new market players or institutions;
Strict conditions and high legal barriers for businesses to get credit.	Decline in non-performing loans.	3. Continue legislating and implementing robust policies & regulations;
High recovery rates and weak legal framework related to insolvency.	In line with EU in protecting minority investors, ease of starting a business, and ease of enforcing contracts.	

Compared to EU average, high bureaucracy in administrative practices in relation to ease of starting a business, ease of getting electricity, ease of registering property, ease of paying taxes, and ease of trading across borders.	Strategy is in place to reduce administrative burdens for businesses.	<p>4. Tap into new niches including sustainable &amp; green finance to back a green recovery.</p> <p>5. Ensure the effective implementation of the strategy to reduce administrative burdens.</p> <p>6. Address administrative burdens which are present beyond the strategy that is currently in place through the further digitalization of the public sector.</p> <p>7. Digitalisation need to not only include investment in infrastructure but more importantly softer elements such as digital signatures.</p>
<p><b>COVID-19 Impact</b></p> <p>Potential increase in non-performing loans.</p> <p>Potential increase in administrative and legal barriers in relation to access to capital, as financial institutions become more cautious.</p> <p>Potential increase in inefficiency of administrative processes as institutions have more measures to implement but lower funds available.</p>		

*Source: Authors*

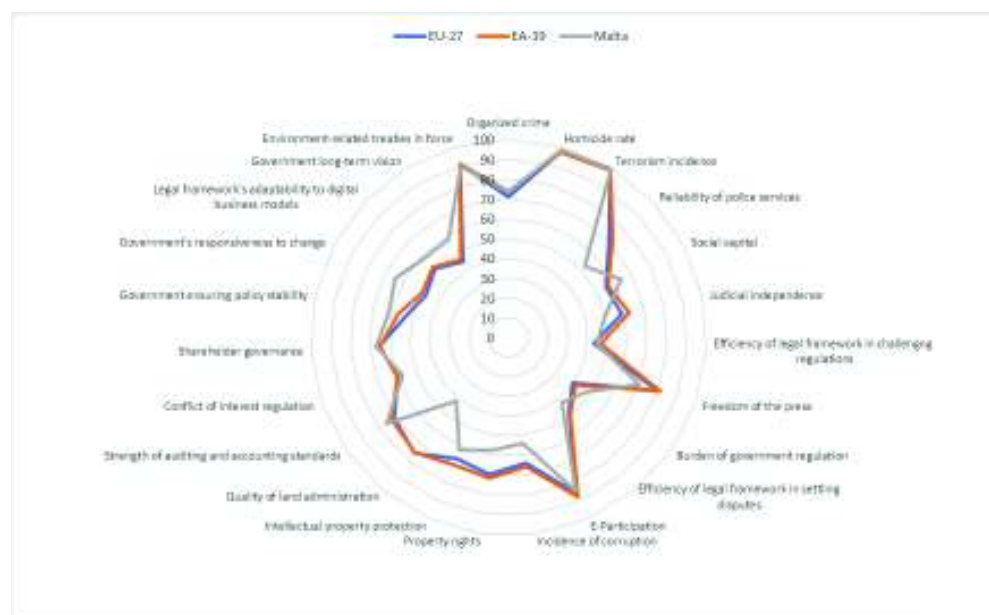
### 3.3 Institutional Quality

Political Institutions through decision-making processes, efficiency of implementing measures, and through the rule of law have the power to enable competitiveness. In this section, we assess the various elements that determine the quality of governance. The quality of institutions has direct and indirect implications on competitiveness. Governance may influence competitiveness indirectly by affecting competition, the investment of human capital, the type and quality of investments, and equality in general. Governance may have a direct influence on competitiveness by for example leading the way in terms of innovation (Fainshmidt, Smith, & Judge, 2016).

The 23 indicators highlighted in [chart 3.42](#) represent Institutional quality, based on data collected by the World Economic Forum for the Global Competitiveness Index (Pillar 1: Institutions). The data shows that overall, Malta ranks 41<sup>st</sup> from 140 countries and scores lower (64), compared to the EU-27 (65) and EA-19 (67) averages.

When zooming into the results, one can notice that Malta's score is in line with EA-19 and EU-27 averages in terms of organised crime (73), homicide rate (99), terrorism incidence (99), efficiency of legal framework in challenging regulations (45), shareholder governance, and environment-related treaties in force (90). In addition, Malta scores higher in terms of social capital (64), burden of government regulation (48), strengthening of auditing and accounting standards (75), policy stability (62), government responsiveness to change (65), laws adapting to digital business models (59), and government's long-term vision (58).

**Chart 3.42 Institutions Indicators, 2019**



Source: WEF (2020)

Despite these positive outcomes, challenges with respect to institutional quality remain. Malta scores lower than EU-27 and EA-19 averages in terms of reliability of police service (53), judicial independence (49), freedom of press (70), efficiency of framework in settling legal disputes (43), e-participation (84), incidence of corruption

(54), property rights (57), intellectual property protection (62), quality of land administration (41), conflict of interest regulation (57).

Some of these outcomes are confirmed by other indicators. For example, the Overseas Security Advisory Council rates Malta as a safe place for tourists in terms of crimes and other hazards (OSAC, 2019). The International Property Rights Index ranks Malta 30<sup>th</sup> from 129 countries, with a score of 6.8 out of 10. Compared to other countries including France, Germany, Ireland, Belgium and Portugal, the results from the Index show that Malta lags behind in terms of control of corruption, rule of law, judicial independence, IP and patent protection, and copyright piracy. Except for patent protection, Malta scores better in these areas compared to Greece, Italy, and Spain.

With regards to the issue of freedoms and Government's attitude towards markets, freedoms and the efficiency of its operations is lower than EU average (e.g. corruption, freedom of press, property rights etc.). This is in line with the findings of the Venice Commission, MoneyVal and IMF reports which emphasises on a governance and institutional reform. In order to address these recommendations, the government will be publishing its institutional reform plans by the end of 2020. In the meantime, the office of the President of Malta is working on a constitutional reform.

In addition to these outcomes, the challenges that Malta faces with respect to the justice system are outlined in the EU Justice Scoreboard (EC, 2019). The scoreboard is based on two indicators: efficiency, quality, and independence of justice. In terms of judicial efficiency, compared to other EU countries, the time needed to resolve litigious civil and commercial cases was higher in Malta in 2017, exceeding 400 days. It is worth noting that in this regard, since 2010, there has been a huge reduction in the time needed in Malta, whereby at the time the rate exceeded 700 days.

In terms of quality of justice, an important indicator is the government expenditure in law courts. Data from the EU Justice Scorecard shows that in line with other EU countries, standards have been applied to improve the quality of judgments in court. These include predetermined elements of reasoning for structure, training, obligation to use clear and simple language, and mechanisms to clarify judgements. In addition to these improvements, there is still room for improvement with respect to the obligations of conciseness, and assessment of the quality of judgements. Improvements are also needed in terms of availability of electronic tools throughout



the judicial procedure to improve access to justice and reduce delays and costs. Another determinant of quality involves government spending in court. Compared to other EU countries, in 2017 Malta ranked 15<sup>th</sup> from 27 countries in terms of expenditure per capita.

Finally, in line with the findings discussed previously with regards to judicial independence, the EU Justice scorecard results show that in 2019 56% of the population believed that the judiciary is independent, increasing from 45% in 2018. Malta has the 11<sup>th</sup> highest rating of trust from all EU-27 countries.

Both the positive and less positive indicator outcomes could be attributed to inherent characteristics of Malta namely its smallness, lack of resources, and geographical location. Being small, governments of small states like Malta can manage and control institutions more effectively. Yet, smallness also means that institutions in countries like Malta are characterised with lack of human resources leading to limited training and specialisation. Smallness can also lead to familiarity and familiarity between top officials, civil servants and the public in general which could lead to lack of accountability and transparency (Oostindie & Sutton, 2006). In addition, trade openness, that is dependency on other countries for economic growth and proximity and membership with the EU help in keeping institutions in check and retain certain standards.

**Table 3.8 Institutional Quality Challenges, Opportunities and Policy Considerations**

Challenges	Opportunities	Policy Considerations
<p>Limitations in the judicial system in terms of efficiency, quality, and independence.</p> <p>Government's attitude towards markets, freedoms and the efficiency of its operations is lower than EU average.</p>	<p>Low crime rates.</p> <p>Strong corporate standards, compared to the EU average.</p>	<ol style="list-style-type: none"> <li>1. Investment in the digitalisation of the judicial system.</li> <li>2. Focus on stability and sustainability of public investments.</li> <li>3. Implementation of measures that enhance bureaucracy and freedoms.</li> </ol>

	Sustainable management of public finances, compared to EU-average.	4. Effective implementation of the institutional and governance reforms as highlighted various international organizations.
<i>COVID-19 Impact</i>		
Challenges in terms of keeping a stable relation between government, markets, and society.		5. Continuation of the constitutional convention, initiated by the President of the Republic.
Challenges in maintaining stable finances.		

*Source: Authors*

### 3.4 Macroeconomic Stability

Monetary and fiscal policy play a crucial role both in terms of short-term economic activity, and long-term competitiveness. The aim of fiscal and monetary policy is to keep inflation low, and sound economic and employment growth accompanied by stable finances. Monetary and fiscal policy are highly intertwined with institutional quality and human capital. Together, these three elements can be regarded as good indicators of macroeconomic competitiveness (Delgado et al., 2012).

While it is very difficult to identify what is deemed as plausible or good monetary and fiscal policy, there are various indicators that help in determining this. Being a member of the Euro Area, Monetary policy in Malta is governed by the European Central Bank. With regards to fiscal policy, the EU provides guidelines, mainly, the excessive deficit procedure and the stability and growth pact. The latter aims to ensure sound fiscal policies and is part of the macroeconomic framework of the Economic and Monetary Union. The former stipulated that government deficit should not exceed 3% and gross debt should not exceed 60% in relation to GDP. These standards are met by Malta.

Two main indicators that determine macroeconomic stability in terms of fiscal and monetary policy include sustainability of debt levels and the level of inflation. In fact, these are the main indicators representing macroeconomic stability for the GCI (Pillar 4). **Chart 3.43** shows that Malta scores 100 in both indicators. This level is in line with EU-27 and EA-19 averages with respect to inflation, and higher than these averages for debt dynamics. These outcomes confirm the arguments and analysis outlined in

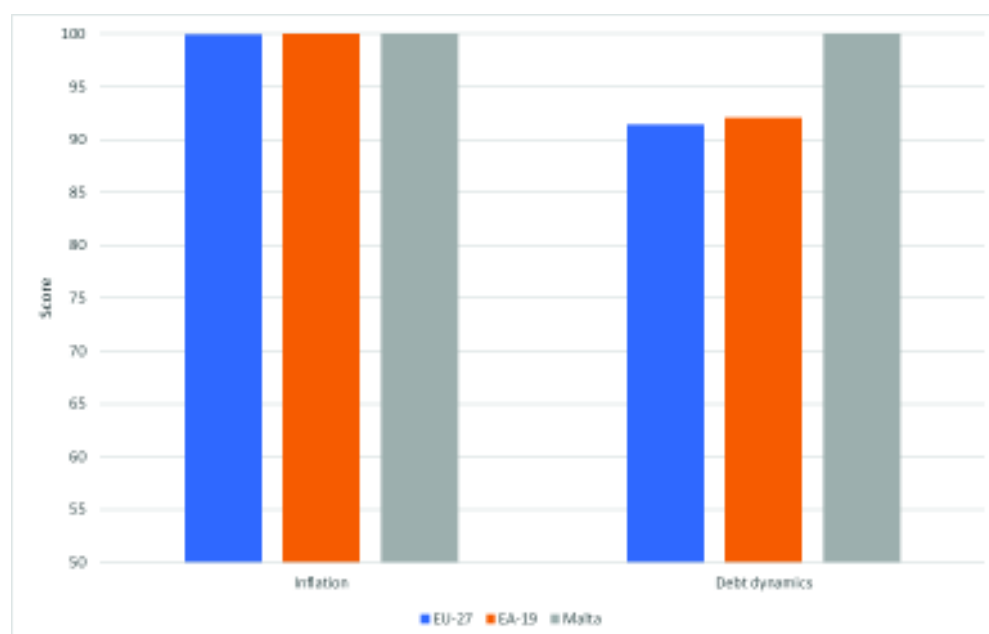
chapter 1 of this report, showing that Malta's macroeconomic environment is stable and sound.

**Table 3.9 Institutional Quality Challenges, Opportunities and Policy Considerations**

<b>Challenges</b>	<b>Opportunities</b>	<b>Policy Considerations</b>
<p>Retain a stable macroeconomic environment.</p> <p>Continue reducing the debt levels.</p>	<p>Enhances efficiency in public spending</p>	<ol style="list-style-type: none"> <li>1. Minimise the impact of COVID-19 on the economy.</li> <li>2. Keep stability in public financing whilst addressing the issues brought about by the pandemic.</li> </ol>
<p><b>COVID-19 Impact</b></p> <p>Challenges in maintaining stable public finances due to the economic effects of COVID.</p>		

*Source: Authors*

**Chart 3.43 Macroeconomic Stability Indicators, 2019**



*Source: WEF (2020)*

### **3.5 Market Conditions**

The concept of market conditions refers to the efficiency of markets in terms of how they are functioning and operating. The concept also covers the effectiveness of market institutions. In view of assessing market conditions as a pillar of competitiveness, this section will review the nature of the Maltese market in terms of size and openness, followed by an analysis of the product and consumer market.

#### **3.5.1 Market Size, Openness, and Integration**

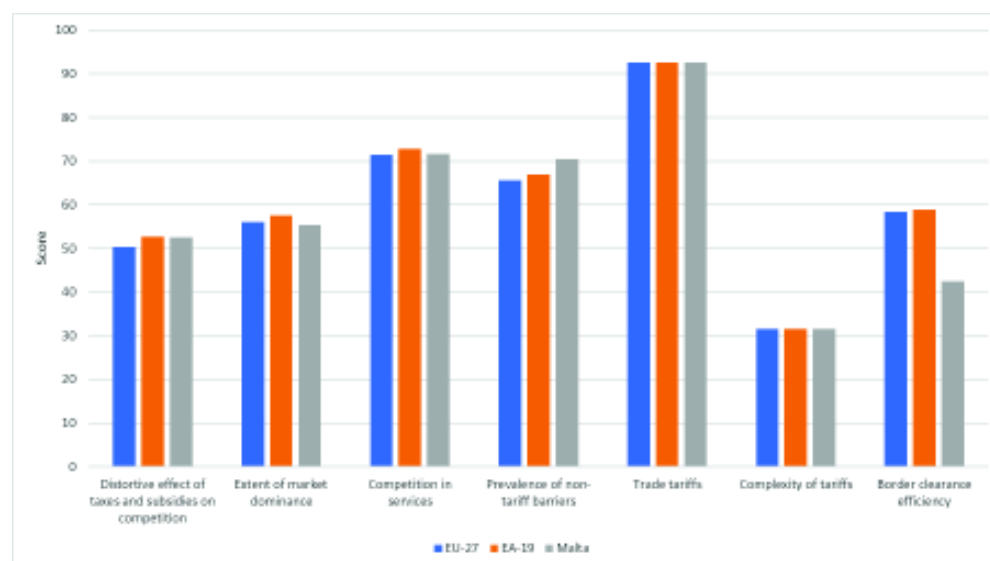
The size and openness to trade are important elements for competitiveness. The size of a market affects its competitiveness as a result of the lack of economies of scale. Due to the nation's small market size, Malta's economic growth and development depends on international players and markets. In fact, "in the era of globalisation, international markets have become a substitute for domestic markets, especially for small countries" (Schwab, 2009, pg. 6) Trade openness and integration is also likely to lead to higher competition. As new market players enter the market, there would be higher pressure on existing firms to enhance their competitiveness (Pilinkiene, 2016).

### 3.5.2 Product Market

Another factor that is an indicator of the efficiency and effectiveness of market conditions is product market competition. The higher the level of competition the higher the level of competitiveness, as markets tend to strive to become more efficient. In addition, higher competition enhances competitiveness as it is likely to enable investment in human resource capabilities and investment in the development of better strategies (Schwab, 2009).

The indicators that determine a sound product market are outlined in [chart 3.44](#). Malta ranks 40<sup>th</sup> from 140 countries in terms of product market competition, with a score of 60, slightly lower than the EU-27 and EA-19 averages of 61 and 62, respectively. Six out of seven indicators show that Malta is in line with the EU in terms of progress. These similar outcomes across the board are mainly a result of Malta's membership in the economic and monetary union which features the principles of a common market, customs union, and monetary union. In line with these outcomes, Malta lags in terms of boarder clearance efficiency, highlighting the need to enhance effectiveness and efficiency of clearance process by customs.

**Chart 3.44 Product Market Indicators, 2019**



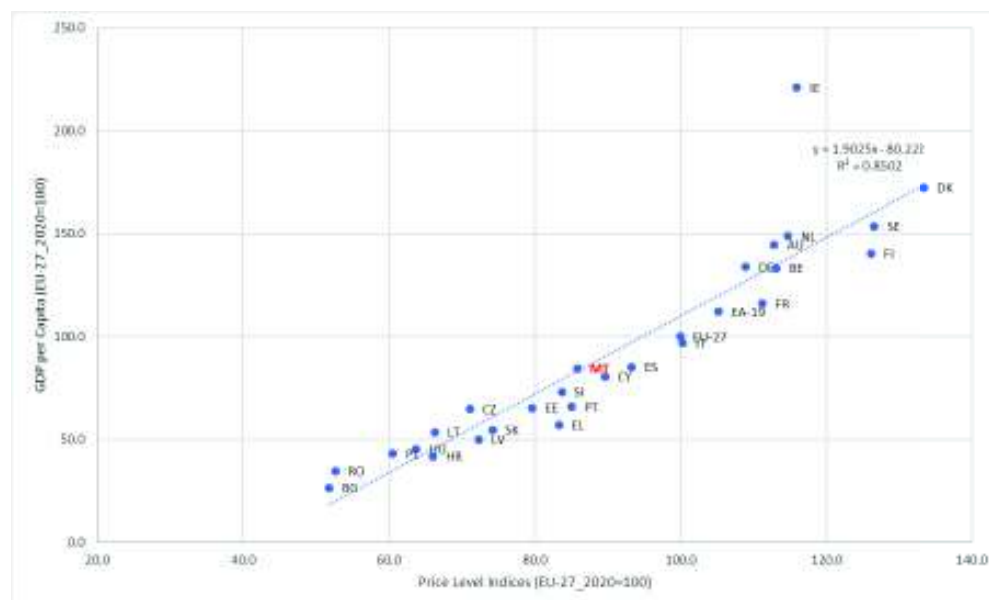
Source: WEF (2020)

### 3.5.3 Consumer Market

A healthy consumer market is also an important element to ensure stable market conditions, and competitiveness. Two important consumer market indicators include consumer confidence and consumer expectations. Low consumer confidence leads to lower demand and thus lower firm profitability. This is likely to affect a firm's investment in human and capital resources, and thus tampering the competitiveness (Delgado et al., 2012).

Despite the downward spiral in consumer confidence as a result of COVID-19, it is important to note that the consumer market in Malta was relatively stable pre-COVID-19. **Chart 3.45** shows that Malta's prices vis-à-vis the GDP per capita are balanced. Despite having lower GDP per capita compared to EU averages, Malta also has a lower price index. This is a signal of a fair consumer market. This is also a result of the relatively low tax on goods and services (18%), and low maximum income tax (35%) compared to other countries. Despite the lower rates, taxes on goods and services as a percentage of GDP are higher than EU average which is also an indication of a strong consumer market<sup>51</sup>.

**Chart 3.45 Price Levels and Growth, 2018**



Source: Eurostat (2020)

<sup>51</sup> <https://appsso.eurostat.ec.europa.eu/nui/submitViewTableAction.do>

Another consumer market indicator that affects competitiveness is consumer expectations. This can enhance competitiveness as these high expectations force companies to innovate and become more efficient. These consumer expectations are measured through the EU Consumer Scoreboard. Through the scoreboard, the EU monitors national consumer conditions based on knowledge and trust, compliance and enforcement, and complaints and dispute resolution.

Data from the EU consumer scorecard as at 2018 shows that the overall market performance indicator for Malta is 83.2, higher than the EU average, 3 score points higher than the EU-28 average, but 1.3 score points less than 2015. Overall, results show that consumer markets in Malta are functioning properly. Markets that are significantly important such as banking and financial services, and those related to tourism, such as accommodation and tourism are all functioning above the EU average. It is worth mentioning that while comparability, trust, expectations and choice component are above EU average in the goods and services market, the scores registered in 2018 were lower compared to 2015. The problems and detriment component remained stable but below the EU average.

Based on the analysis in this section, the challenges opportunities and COVID-related challenges are outlined. These feed into the policy considerations upon which we shall be basing our recommendations.

**Table 3.10 Market-Related Challenges, Opportunities and Policy Considerations**

<b>Challenges</b>	<b>Opportunities</b>	<b>Policy Considerations</b>
Economies of scale Dependency on international trade  Bottlenecks associated with	Overall product market efficiency and effectiveness are in line with EU average. Stable and well-functioning consumer market. Important markets such as banking and financial services, and those related to tourism, such as accommodation and tourism are all functioning above the EU average.	1. Restore both consumer and producer confidence. 2. Enhance efficiency in terms of customs clearance through enhanced digitalisation.

the clearance process by customs.		
<p><i>COVID-19 Challenges</i></p> <p>Decline in consumer and producer confidence.</p> <p>Potential changes in consumer and producer expectations.</p>		

*Source: Authors*

### 3.6 Innovation

Innovation is a crucial factor and enabler of national competitiveness and economic growth; it leads to enhanced efficiency and productivity. Innovation leads to lower costs, better-quality goods and services, and increased market efficiency, giving countries a competitive advantage. The pursuit of competitiveness through innovation remains a crucial objective especially for countries like Malta and the rest of Europe who aim to generate growth through a knowledge-driven economy (Herman, 2018; Veselica, 2019). More specifically, within the context of the European Union, Innovation is regarded as a key driver for sustainable and inclusive growth. In fact, the aim of creating an “Innovation Union” is one of the seven flagship initiatives within the EU2020 Strategy, with various funds targeted at research and innovation in Europe in order to generate innovative goods and services. In order to assess the situation of Innovation in Malta, this section examines the EU-2020 targets, the Innovation pillar within the GCI, and the EU Innovation Scoreboard.

In order to assess the situation of innovation in Malta, one has to examine indicators beyond investment in R&D. The 12<sup>th</sup> pillar of the Global Competitiveness Index outlines various indicators that allow a more detailed analysis of the innovation situation in Malta. Malta ranks 37<sup>th</sup> from 140 countries with a score of 50, lower than the EU-27 (59) and EA-19 (61). The indicators for innovation that fall under the innovation pillar are highlighted in [chart 3.46](#). The only two indicators in which Malta exceeds the EU averages are trademark applications (mainly emerging from pharmaceutical and gaming companies) and diversity of the workforce in terms of gender, religion, and ethnicity.

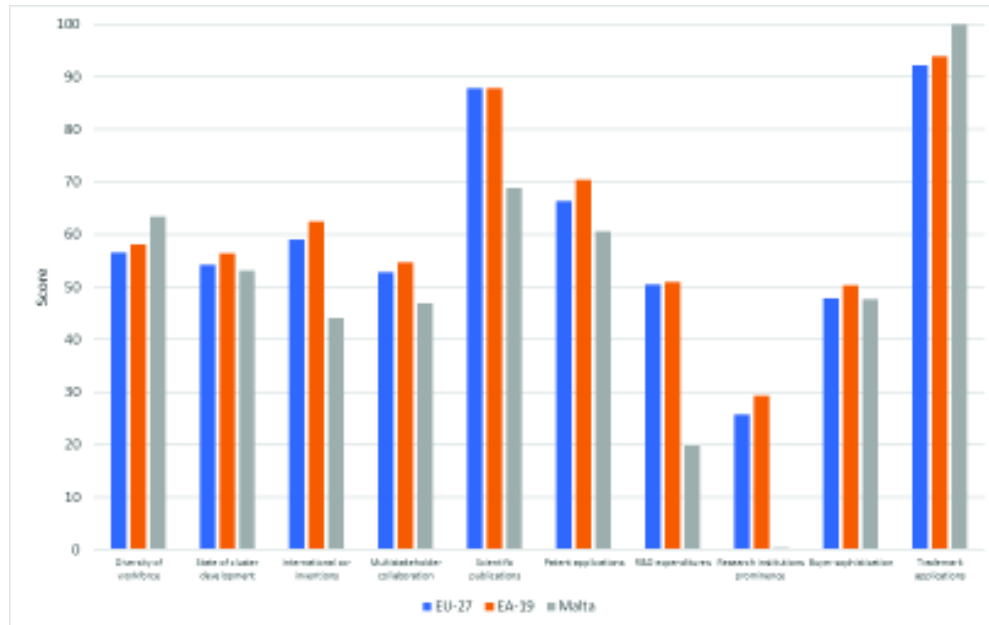


While these two indicators are important for innovation, they are not enough to ensure that innovative products are produced locally. Other key indicators for innovation remain below EU averages including cluster development, international co-inventions, collaborations with multi-stakeholders, scientific publication, patent applications, investment in R&D, prominence of research institutions, and buyer sophistication. All these elements are key enablers of an innovation ecosystem. Further details on these elements are outlined below through the EU Innovation Scoreboard.

The overall innovation outcomes of the GCI are confirmed through the European Innovation Scorecard whereby Malta's Index for 2018 stood at 0.41, below the EU-27 and EA-19 averages which stood at 0.46 and 0.49, respectively (See chart 3.47). With this score, Malta ranks 16<sup>th</sup> among the EU-27 countries. Despite the relatively low index, Malta is regarded as a moderate innovator due to the significant progress registered over the past years in innovation-related investment.

The indicators covered within the innovation scoreboard (See chart 3.48) can be divided in three areas. These national-level innovation investment (human capital, research systems, innovation-friendly environment), financial investment (finance and support and firm investment), innovation-based actions (innovators, linkages, and intellectual assets), and innovation outputs (employment impact and sales impact).

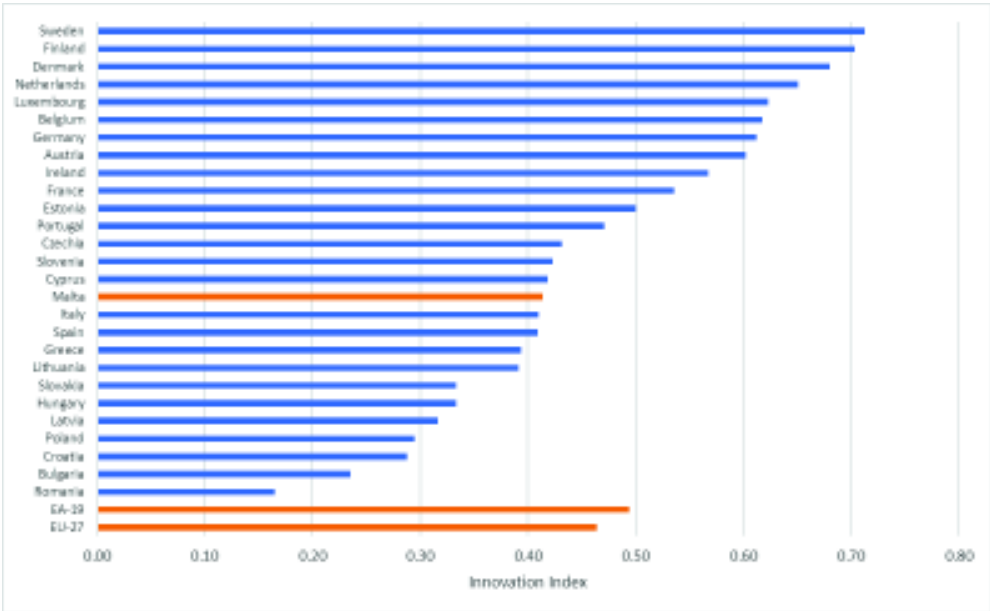
**Chart 3.46 Innovation Indicators, 2019**



Source: WEF (2020)

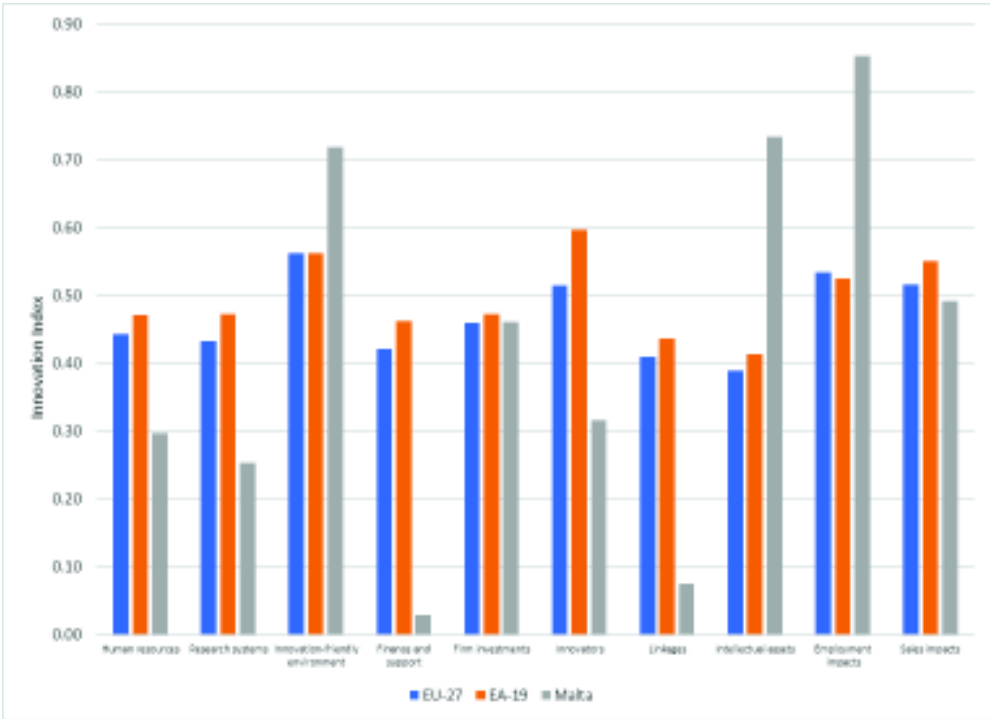
**National-level innovation investment** covers areas that are external to firm investment including human resources, research systems and innovation-friendly environment. Human resources that can work in an innovative environment such as doctoral students are limited, as outlined in the education section. Despite these limitations, the number of doctoral students enrolled at the University of Malta has been increasingly significantly over the past years from 78 in 2013 to 147 in 2018. The figure excludes students who are currently enrolled under the Master of Philosophy in order to pursue their doctoral education.

Chart 3.47 Innovation Index, 2018



Source: European Innovation Scoreboard (2020)

Chart 3.48 Innovation Scorecard Indicators, 2018



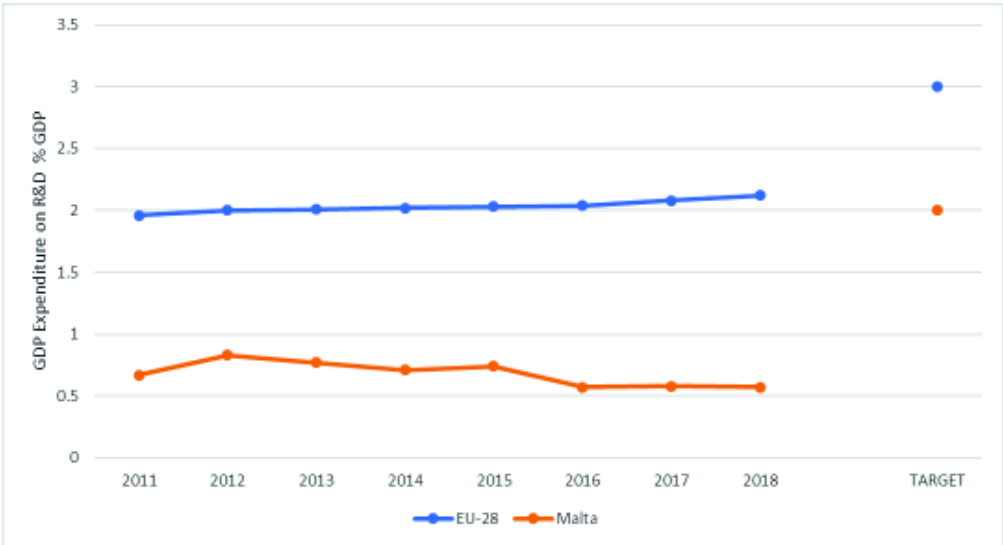
Source: European Innovation Scoreboard (2020)

The research systems are also less attractive compared to the EU average due to low levels of scientific publications and citations, also outlined through the GCI, and also because Malta is not very attractive for foreign doctoral students. Any innovation system requires research clusters where firms can thrive with respect to innovation. In contrast to the case of human resources and research systems, Malta exceeds EU averages through the innovation-friendly environment as a result of high broadband penetration. However, caution should be applied in labelling Malta as an innovation friendly country based on broadband penetration. While this is a relevant indicator, an innovation eco-system goes beyond broadband penetration and should also include the levels of incubation and acceleration, entrepreneurial intentions, mentorships, and events organised for start-ups and innovative products (Haines, 2016).

The two indicators that represent the **financial investment** include finance and support, and firm investments are both below the EU average. The area of finance and support represents government spending on R&D and venture capital expenditures. The latter area is not yet developed in Malta. The former area is an EU 2020 target. As illustrated in [chart 3.49](#), on average between 2011 and 2018 growth in GDP expenditure on R&D has increased slightly by 1.13%, while in Malta it decreased by 1.41%.

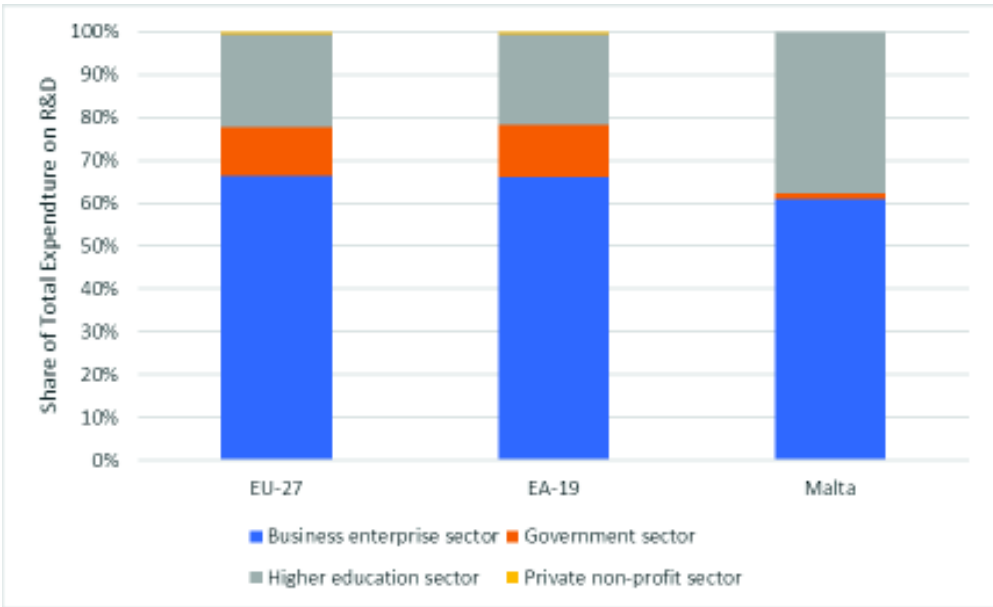
While government spending is significantly lower than EU average, business sector spending is just below the average. As illustrated in [chart 3.50](#), from all Expenditure on R&D, 61% was undertaken by the business community, slightly lower than the EU-27 and EA-19 averages which amount to 66% each. This is confirmed when looking at the “firm investments” indicator. The indicator for Malta is below the EU and EA averages. It includes firm investments in R&D and non-R&D investment in expenditure, and also investment in training people in ICT skills by the business sector.

**Chart 3.49 Government Expenditure on R&D**



Source: Eurostat (2020)

**Chart 3.50 Government Expenditure on R&D**



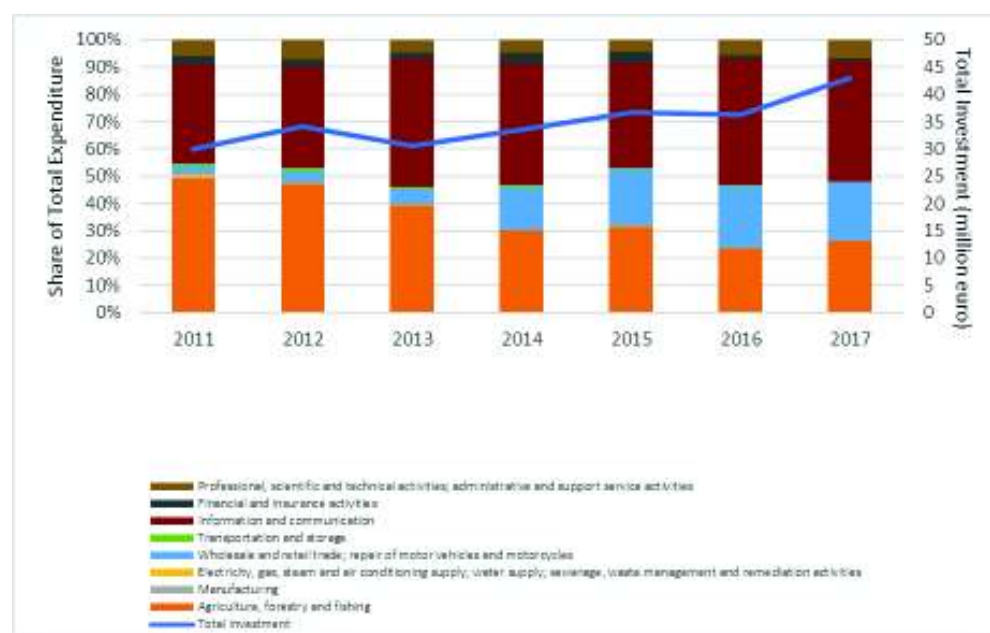
Source: Eurostat (2020)

**Chart 3.51** shows that overall, R&D investment in the public sector increased by 8.9%. The bulk of the investment (92%) is undertaken by the manufacturing, wholesale and

retail, and information and communication sectors. In 2017, the share of these industries from total investment was 26.4%, 21.4%, and 44.2%, respectively. Professional services and financial and insurance services registered a share of 6.8% and 1.1%, respectively in 2017.

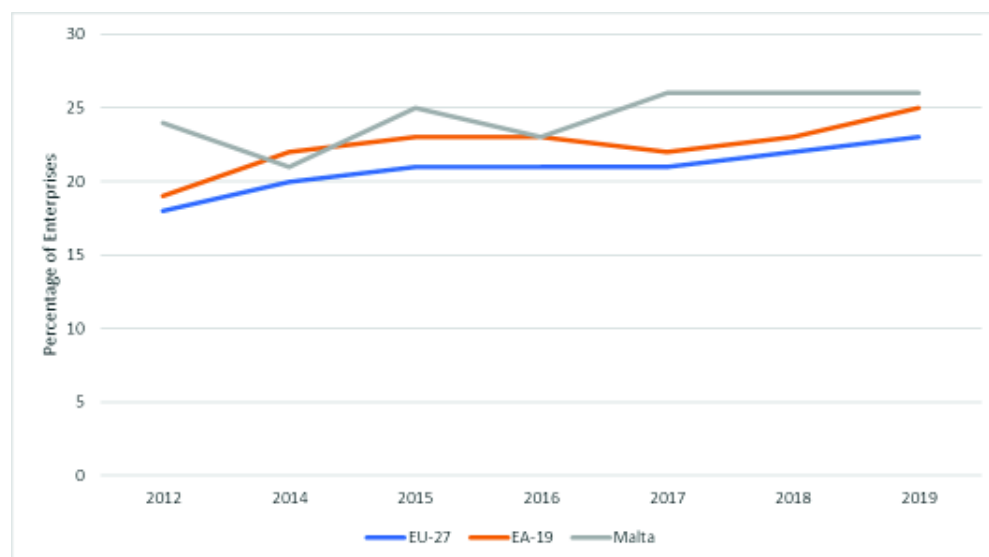
In line with this, firm investment in upgrading ICT skills in Malta exceeds the EU and EA averages. **Chart 3.52** illustrates that share of enterprises that provided training to their personnel to develop ICT skills. Overall, in 2019 26% of Maltese firms invested in such training, compared to an average of 23% and 25% of firms in the EU-27 and EA-19, respectively. Still, as explained in the ICT infrastructure section, there is a limited skill-set of people with tech skills that can work in knowledge-intensive sectors.

**Chart 3.51 Business Expenditure on R&D**



Source: Eurostat (2020)

**Chart 3.52 Enterprises providing training to develop and upgrade ICT skills for their personnel**



Source: Eurostat (2020)

With regards to **innovation-based actions** in the market, the EU Innovation Scorecard involves three indicators namely innovators, linkages, and intellectual assets. In terms of intellectual assets, Malta's index for 2018 stood at 0.73, higher the EU-27 and EA-19 averages of 0.41 and 0.44, respectively. This is due to a high level of trademark and design applications as explained previously.

The innovators indicator involves SME investment in innovation in relation to products, processes, marketing and organisational innovations, and in-house innovations. Overall the index for Malta for this indicator is 0.31, significantly below the EU-27 and EA-19 averages of 0.52 and 0.60, respectively.

Linkages involve collaborations of SMEs with other institutions such as government, and academia. In this case, Malta's index is 0.075, significantly lower than the EU-27 and EA-19 averages which stood at 0.41 and 0.44, respectively in 2018. Data from the European Commission Research and Innovation Observatory collected in 2014 shows that Malta lags behind in terms of enterprises co-operating with government, public, or private research institutes. With a cooperation rate of 2.6%, Malta ranks 25<sup>th</sup> from the EU-27 countries. Malta also lags behind in terms of enterprises co-operating with

universities or other higher education institutions. The cooperation rate for Malta is 4%, the second lowest rate across the EU-27 countries<sup>52</sup>.

Finally, the last two indicators of the EU Innovation Scorecard represent **innovation outputs**. The impact of innovation is highlighted through the employment and sales impact indicators. The index for employment impact in Malta in 2018 was 0.85 and exceeds the EU-27 and EA-19 averages, both amounting to 0.53. **Chart 3.53** illustrates the share of employment from total employment in high and medium tech manufacturing and high tech service industries. The data shows that Malta's share of employment in high to medium tech manufacturing industries over the 2011-2019 period was on average 3.7%, below the EU-27 and EA-19 averages of 6.1%. Overall, for the period under review the share for EU and EA averages remained stable but on average Malta's share declined by 2.1%. With regards to high-tech service industries, for the period under review the average share of employment in Malta stood at 3.6%, higher than the EU-27 and EA-19 averages of 2.8%. The rate of growth in the share of employment in Malta for the period was 1.4%, higher than the EU-27 and EA-19 averages of 1.3% and 0.9%, respectively. Thus, it can be deduced that the high employment output is mainly as result of employment in knowledge-intensive service industries.

Unlike the employment impact indicator, the sales impact indicator, (which covers exports that are medium to high tech, exports that stem from knowledge-intensive services, and new to market/industry innovations) for Malta in 2018 was 0.49 is slightly below EU-27 and EA-19 averages OF 0.52 and 0.55, respectively. The indicator is below EU average mainly due to service exports and sales for new innovations in the market.

When taking into consideration both employment and sales impact it can be deduced that Malta is not reaping the benefit from the employment impact which is predominantly derived from increases in employment in service-based industries.

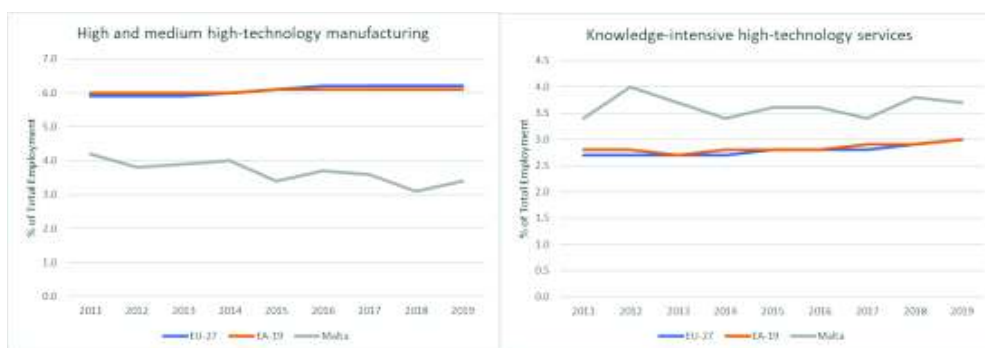
In order to enhance innovation, countries do not necessarily need to invest heavily in all indicators that lead to high innovation. **Box 3.2** explain what combinations of indicators can be adopted by countries to reach an optimal level of innovation.

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<sup>52</sup> <https://rio.jrc.ec.europa.eu/index.php/stats/share-enterprises-cooperation-academia>



**Chart 3.53 Employment in Knowledge-Intensive Industries**



Source: Eurostat (2020)

**Box 3.2: Which is the investment required to enhance innovation?**

Based on the innovation scoreboard, a configurational analysis using fuzzy-set Qualitative Comparative Analysis (fsQCA) conducted by Fabri and Cassar (forthcoming) analysis the determinants (excluding the impacts) of the high and low innovative countries (See table 3.11). The results are based on the EU-27 countries for the period 2011-2018. The results show that not all of the factors must be present in order to attain high levels of innovation, however, at least six from the eight indicators need to be present in the economic ecosystem in order to achieve high innovation. Details on the method and measures are found in Appendix 3.1.

The results show that all three areas are important to achieve high innovation. In all configurations, there is at least the high presence of one indicator under each of the three elements. The results for high innovation indicate two sets of configurations. First, high innovation can be achieved through intensive investment in national-level investment including intellectual capital (human resources and research systems) and an innovation-friendly environment, combined with general government and venture capital financial support (Configurations 1 and 2). Second, intensive financial investment from the public and private sector coupled with the moderate presence of intellectual capital through human resources or research system (Configurations 3 and 4).

Innovation-based actions are important across the two sets, in fact, three from four configurations have high levels of all three indicators that fall under this area. These outcomes show that countries do not need to invest significantly in all areas, however, it is important to invest in the right combination of enablers.

The results also show that countries with low levels of innovation do invest significantly in some of the indicators, however, there is an overall lack of investment in key areas. The general levels of investment are much lower compared to highly innovative countries. This outcome implies that the indicators assessed provide a relevant overview of the presence of innovation in a country.

One could also argue that low innovators are not investing in the right combination of innovation enablers. For example, in configuration 8 there seems to be a high level of investment with 4 indicators being high. Still, the countries falling under this category are amongst the lowest innovators. The configuration shows that the countries that fall under this category are investing in two innovative-based actions, similar to configuration 1. However, if one had to compare to configuration 1 one could argue that there is a mismatch in investment of enablers. What these countries need is a shift in financial resources from firm-level investment to public investment and venture capital. Also, the countries need to invest more in intellectual capital. To achieve high levels of innovation, it is important to ensure that the adequate enablers are in place, otherwise the investment undertaken may be inefficient with limited results. These outcomes are important to understand effectiveness and efficiency in terms of financial allocations. Thus, countries that are modest or moderate innovators should seek to design policies that focus on specific areas of innovation rather than investing in all enablers in moderate amounts of financing.

**Table 3.11: Sufficiency Analysis based on the Innovation Scoreboard 2011-2018, EU-27<sup>53</sup>**

	High Innovation				Low Innovation			
	1	2	3	4	5	6	7	8
<i>Permutation</i>								
<i>National-level Investment</i>								
Human resources	●	●	●	⊗	⊗	⊗	⊗	⊗
Research systems	●	●	⊗	●	⊗	⊗	⊗	⊗
Innovation-friendly environment	●	●	⊗	⊗	⊗	●	⊗	●
<i>Financial Investment</i>								
Finance and support	●	●	●	●		⊗	⊗	⊗
Firm investments	⊗		●	●	●	⊗	⊗	●
<i>Innovation-Based Actions</i>								
Innovators	●	●	●	●	●	⊗	●	●
Linkages		●	●	●	⊗	⊗	●	⊗
Intellectual assets	●	●	●	●	⊗	⊗	⊗	●
Consistency	0.878	0.882	0.887	0.934	0.999	0.999	0.999	0.999
Raw Coverage	0.457	0.816	0.364	0.392	0.240	0.197	0.198	0.161
Unique Coverage	0.044	0.287	0.019	0.015	0.051	0.066	0.025	0.023
<b>Overall Solution Consistency</b>	<b>0.847</b>				<b>0.999</b>			
<b>Overall Solution Coverage</b>	<b>0.893</b>				<b>0.36</b>			

*Source: Fabri and Cassar (forthcoming)*

While Malta has a long way to go in terms of the development of Research and Innovation, various measures are in place by Malta Enterprise and MCST. Malta enterprise offers assistance to companies to promote research and development in terms of tax credits on direct and indirect costs related to R&D projects, assistance for R&D feasibility studies, support to companies for the development of innovative products and services, tax credits to companies who employ knowledge-intensive workers, tax deduction on income arising from patents, and financial support to companies that launch innovative products and services that help improve the daily life of people. MCT also offers a number of grants under the FUSION programme to promote private and public sector research. In addition to these funds, the European Commission recently confirmed €5.3 million direct grants to support R&D projects in relation to the COVID-19 outbreak. Further funds are expected to be available through the Digital European Programme for the period 2021-2027).

<sup>53</sup> Black circles (“●”) indicate that the presence of the condition is high in relation to EU-27 countries, and open circles (“⊗”) indicate that the presence of the condition is low in relation to EU-27 countries. Blank spaces indicate irrelevance of the condition to the solution.

As highlighted in last year's report there is a drive towards digital innovation now in Malta. Different public bodies were set up including Malta Digital Innovation Authority, the Digital Malta Steering Committee, Tech MT and an Artificial Intelligence, Internet of Things (AI & IoT) Taskforce, and the Digital Economy Think Tank.

In addition, through the MCST National Research and Innovation Strategy the government is promoting innovation in specific sectors including maritime services, aquaculture, high value-added manufacturing with a focus on process and design, aviation and aerospace, health with a focus on healthy living and active ageing, and e-health, tourism product development, resource-efficient buildings, ICT-based innovation. The overall aim is that through this specialised investment, Malta will have a comprehensive R&I support ecosystem and a stronger research base. Further detail on each of these areas is provided in the recommendations section.

In line with the discussion above, the challenges, opportunities, and COVID-19 challenges are outlined in the Table below. Based on this analysis, a number of policy considerations are highlighted which will feed into the recommendations section.

**Table 3.11 Innovation & Digitalisation Challenges, Opportunities and Policy Considerations**

Challenges	Opportunities	Policy Considerations
Compared to the EU average, Malta has a poor innovation ecosystem with lack of cluster development, limited collaborations that promote innovation, and buyer sophistication.	High trademark applications, compared to EU average.	1. Address the issues that are leading to a weak innovation ecosystem.
Limited number of doctoral students, compared to the EU average.	High workforce diversity in terms of gender, religion, and ethnicity.	2. Encourage start-ups that focus on innovation and digitalisation.
Absence of venture capital investment.	Private sector investment in ICT skills and R&D is in line with EU average.	3. Address the technology-related skill shortages among Maltese workers.
		4. EU response on digitalisation.

<p>Low Government spending on R&amp;D compared to the EU average.</p> <p>Compared to EU average, low SME investment in innovation in relation to products, processes, marketing and organisational innovations, and in-house innovations</p> <p>Malta is not reaping the benefit from the employment impact in terms of sales, as a result of low exports that are medium to high tech and exports from knowledge-intensive industries, and low innovators in the market.</p>	<p>High employment impact of innovation primarily derived from service-based industries.</p> <p>Strong ICT Infrastructure.</p> <p>Due to the small size of the market, shift towards innovation can happen faster compared to larger countries</p> <p>Focus on the development of R&amp;I through the sectors identified through the National Research and Innovation Strategy.</p> <p>EU and national funds targeted towards R&amp;I.]</p>	<p>Implementation of the Digital Europe Programme.</p> <p>5. Promote innovation in niches outlined by the National R&amp;I Strategy.</p> <p>6. Promoted government investment in R&amp;D.</p> <p>7. Ensure the effective absorption of funds related to R&amp;I.</p> <p>8. Ensure an integrated approach among the different public bodies responsible for the implementation of R&amp;I.</p>
<p><b>COVID-19 Impact</b></p> <p>Increase in the role of the digital economy among individuals, companies, and even the public sector.</p> <p>Potential increase in the demand for high-tech companies to help businesses adapt to switch to cloud services and services related to remote working, online shopping, and the provision of online services.</p>		

Potential increase in demand for innovation in order to ensure a sustainable economic recovery.

*Source: Authors*

### **3.7 Malta's Overall Competitiveness**

Throughout the previous sections, we discussed in detail Malta's situation across the different factors that determine competitiveness. Based on this analysis it is important to understand where Malta stands in terms of competitiveness and attractiveness when we bring all of these factors together in one basket. Thus, the aim of this section is to assess Malta's overall competitiveness and attractiveness within the EU.

#### **3.7.1 Malta's Competitiveness within the EU**

The best tool available to assess a country's competitiveness is the GCI, which takes into consideration 12 crucial pillars for competitiveness including; institutions, infrastructure, ICT adoption, macroeconomic stability, health, skills, product market, labour market, financial systems, market size, business dynamics, and innovation capability.

It is important to note that while the index is very relevant and important, the outcomes need to be interpreted with caution as a result of the various limitations involved. First, the index comprises several technical and statistical limitations which may affect the validity and reliability of the measures<sup>54</sup> and managerial surveys. Second, while the index includes the current state of a country based on present policies, it does not include the effect of new policies. Third, the index does not reflect or take into consideration the specific characteristics of countries.

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<sup>54</sup> In this study, we assess the factors that determine competitiveness because this reflects the economy's productivity and efficiency. However, there are other factors that determine a country's competitiveness including the state of the environment and resource efficiency as outlined through the Sustainable Competitiveness Index. Also, within the GCI some measures are not comprehensive as others. For example, while institutions has 20 variables, health is only measured through one variable, macroeconomic stability has two.

Even though Malta is a small island state with limited resources and a number of inherent disadvantages which limit the country's ability to reap the benefits of economies of scale, the country still registers a relatively high competitiveness score. In 2019, Malta's score was 68.5, similar to the scores attained in the previous years. This score is just below the EU-27 average of 72, the score ranks Malta the 18<sup>th</sup> highest within the EU-27. Overall Malta ranked 38<sup>th</sup> from 140 countries in terms of competitiveness in 2019.

Assuming GDP per capita as a proxy to productivity (Hall & Jones, 1997), we plot GDP per capita against competitiveness to assess the relationship between productivity and competitiveness across the 27 EU Member States. In fact, when regressing log GDP per capita on GCI score using the EU-27 countries, the outcome reveals that 75% of variation in GDP per capita is explained by competitiveness (See chart 3.54).

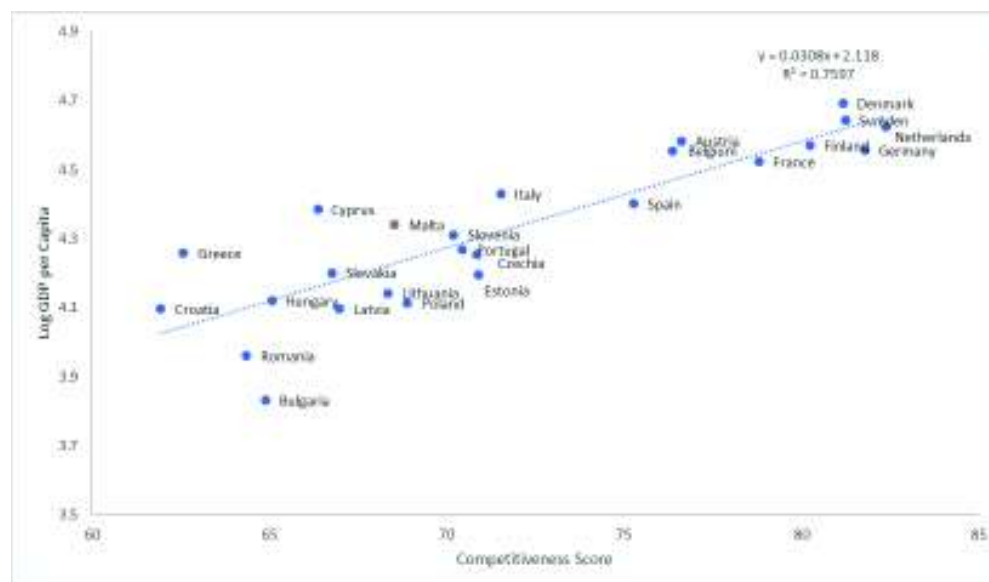
As illustrated in chart 3.54, there is a strong and positive relationship between GDP per capita and competitiveness in the EU. The highest performers include Denmark, Sweden and the Netherlands, followed by Finland, Germany, Austria, Belgium, and France. Overall, Malta's productivity levels are high given our competitiveness. Compared to countries with similar competitive levels like Lithuania and Poland, Malta is more productive. In addition, while countries like Slovenia, Czech Republic, and Estonia have relatively higher competitiveness scores compared to Malta, Malta is more productive compared to these countries. This means that Malta's overall competitiveness situation is likely to be better than that portrayed by looking at the outcome of the GCI on its own.

In order to assess a country's attractiveness, one has to weigh the competitiveness levels of that country against the factor input costs, in particular, labour costs (See chart 3.55). This is essential in order to understand the flows of investment, the sustainability of a country's current prosperity, and the likely path for future growth and prosperity (Delgado et al., 2012).

When plotting labour costs (log) against competitiveness across the EU-27, it can be deduced that Malta is in line with the average in terms of attractiveness. Countries, like Poland, with similar competitiveness levels may be more attractive to foreign investors because of their relatively low labour costs. Similar arguments apply to countries like Estonia, Czech Republic and Portugal when compared to Malta. On the other hand,

countries like Cyprus have high labour costs given their level of competitiveness, such countries are less attractive compared to Malta. Similar arguments apply to Greece, Croatia, and even Slovenia. The latter country may have a higher competitiveness level compared to Malta, but its labour costs are higher given their competitiveness.

**Chart 3.54 GDP per Capita and Competitiveness, EU-27, 2019**



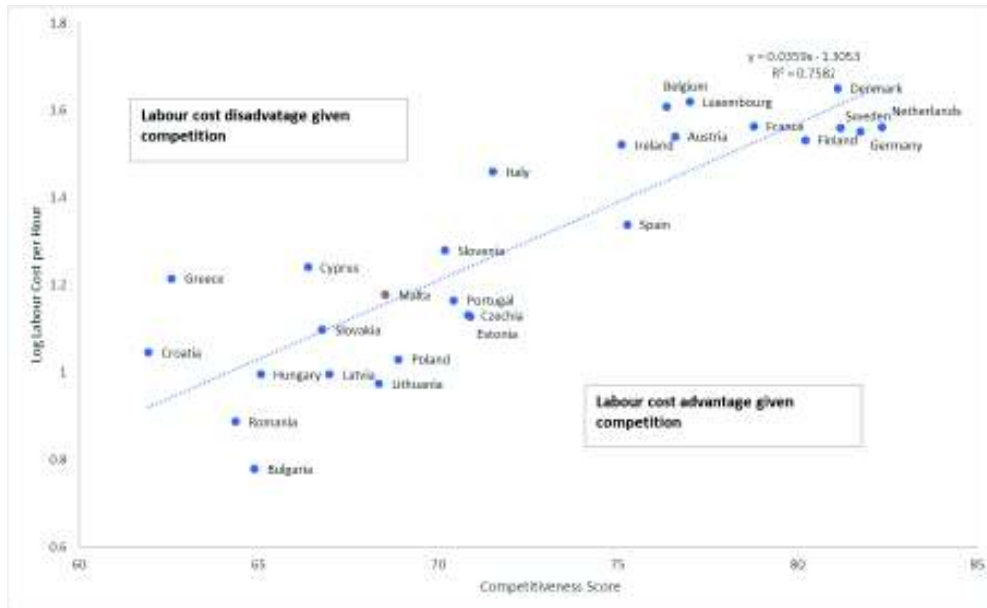
Source: Eurostat & WEF (2020)

In line with this analysis, and based on the close link between competitiveness and productivity, another crucial question to ask is: **What can we do to boost our competitiveness?** In order to be able to answer this question, it is important to look at Malta's score vis-à-vis the high performing Member States across the 12 pillars.

When compared to the EU-27 scores, Malta is in line with the average overall. The main reason why Malta is below EU average is due to its market size which is something that is considered as an inherent disadvantage to the country. This is a main limitation of the index as explained previously, that it does not factor in country characteristics. Other areas where Malta lags behind are specifically associated with the innovation ecosystem, institutions, and infrastructure in general. However, Malta exceeds EU-27 scores in indicators such as ICT adoption, macroeconomic stability, and health. The country is in line with EU-27 averages in indicators involving skills, product market, labour market and financial systems (See chart 3.56).

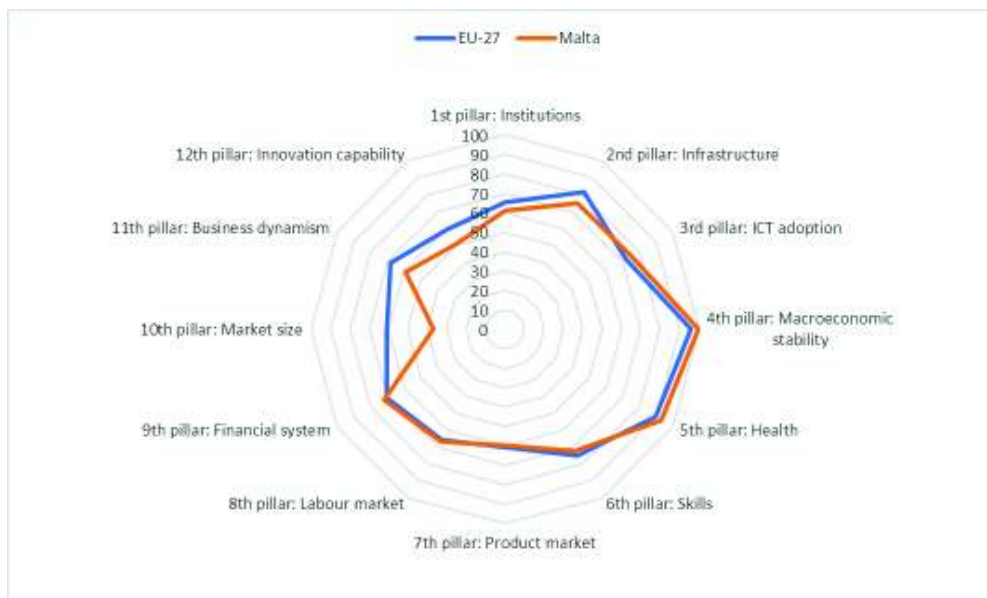


**Chart 3.55 Labour Cost and Competitiveness, EU-27, 2019**



Source: Eurostat & WEF (2020)

**Chart 3.56 Competitiveness Scores, Malta and EU-27, 2019**



Source: Eurostat & WEF (2020)

Malta's challenges in terms of competitiveness are even more highlighted when compared to the top performers across the EU-27, mainly Denmark, Netherland, and Sweden. [Chart 3.57](#) shows that Malta's score is in line with the scores of these

countries in terms of macroeconomic stability, health, and to some extent ICT adoption (Malta is in line with Netherlands in this score). Excluding the market size pillar for reasons explained before, Malta faces challenges in terms of institutions, infrastructure, skills, markets, and innovation ecosystem (business dynamism and innovation capability).

**Chart 3.57 Competitiveness Scores, Malta and Top Performers, 2019**



Source: Eurostat & WEF (2020)

In order to understand how Malta can invest in the different factors leading to productivity to achieve higher levels of competitiveness, one needs to assess the pillars concurrently. Put simply, as stated even by the WEF, although these factors are reported independently, the factors are interdependent, and they reinforce each other. The concurrent analysis of the pillars is essential in order to understand if there are any specific combinations across the pillars that are more important to achieve high competitiveness. This will guide countries like Malta to understand where to effectively and efficiently invest in order to reach the desired targets of competitiveness. This analysis is conducted in [Box 3.3](#).

### **Box 3.3 Which are the factors distinguishing between high and low competitive countries in the EU?**

Using fuzzy-set Qualitative Comparative analysis (fsQCA), the main pillars of competitiveness of the Global Competitiveness Index are assessed concurrently. The sample is based on the EU-27 countries over the period 2017-2019. Details of the method and measures are highlighted in Appendix 3.1.

The outcomes clearly show evidence of nonlinearity, equifinality, and asymmetric relations. Nonlinearity across the variables is shown as two variables can be positively related in one configurations and negatively related in another (e.g., human capital and markets in configurations 1 and 3). Equifinality is shown through the fact there is no single route to achieving high competitiveness or low competitiveness. Asymmetric relations are show through the fact that a variable can be highly present in both high and low competitiveness situations (e.g., innovation ecosystem is high in configurations 1-4 and 9). Asymmetric causality implies that assessing the pillars individually (even through linear regression methods), may lead to undefined outcomes, or overestimation, or even underestimation of the impact of a pillar on an outcome. Further details on the methodology, analysis, and limitations are provided in Appendix 3.1.

Overall the configurational analysis shows that high competitiveness is associated with high levels of ICT and physical infrastructure together with high innovation. In fact, all configurations associated with high competitiveness have high levels of these variables in a consistent manner (Configurations 1-4). This, however does not imply that countries that invest highly in these elements alone will achieve high levels of competitiveness. In fact, low competitiveness countries tend to invest heavily in infrastructure for example (Configurations 5-8), or innovation (Configuration 9), however, these investments are not combined efficiently with the other competitiveness factors, and thus such countries fail to achieve high levels of competitiveness. Therefore, the combination of investment in the different pillars is crucial to achieve high levels of competitiveness.

Institutional stability is registered as a key determining in two from four configurations of high competitiveness. Yet, in low competitive countries, low institutions stability is present. Thus, although institutional stability may not be a

driver for high competitiveness, it is a driver for low competitiveness<sup>55</sup>. This outcome may also be due to the fact that the analysis involves EU-27 countries and institutional stability is relatively high across the board among these countries. What the results show is that excessively high institutional stability may not be a determining factor in countries associated with high competitiveness, but moderate institutional quality may suffice.

In highly competitive countries there is a balance between investment in innovation combined with elements from the enabling environment, human capital, and markets. In order to achieve high levels of competitiveness, two sets of combinations emerge.

The first combination represents ***innovation driven by macroeconomic stability***. Zooming into Configurations 1 and 3, it can be noticed that investment in ICT and other infrastructure and innovative ecosystems are combined with high macroeconomic stability, and high levels of market efficiency or high human capital quality. This combination shows that macroeconomic stability is key to instil confidence and to drive markets to invest in their efficiency or human capital to invest in their abilities to achieve high levels of innovation. Macroeconomic stability is also an important factor that attracts FDI. Countries with high levels of sustained and stable growth attract more foreign investment compared to volatile economies (Ranjan & Agrawal, 2011). FDI in turn enhances competitiveness (Gugler & Brunner, 2007). In addition, as a result of a stable macroeconomic environment, the government may be in a better position to assist the private sector to achieve high levels of competitiveness by investing in the various enablers of competitiveness.

The second combination represents ***innovation driven by the private sector***. As shown in Configurations 2 and 4, when macroeconomic stability is relatively low across the EU-27, high competitiveness is achieved by combining ICT and other infrastructure and innovative ecosystems, with high investment in efficient markets and human capital. In this case, innovation and as a consequence competitiveness is driven by investments of the private sector. In these countries buyer sophistication

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<sup>55</sup> This is synonymous with the word of Herzberg, Mausner, and Snyderman (1959) in management research which indicate that the factors that lead to high motivation are not the exact inverse of the factors that lead to low motivation.

may be high as a result of the high-level of human capital quality, as a result the private markets are constantly challenged to remain competitive and innovate.

Further analysis could analyse the specific factors under each of the indicators to assess how they vary accords high and low competitiveness.

**Table 3.13: Sufficiency Analysis based on the GCI 2017-2019, EU-27<sup>56</sup>**

<i>Permutation</i>	High Competitiveness				Low Competitiveness				
	1	2	3	4	5	6	7	8	9
<i>Enabling Environment</i>									
Institutions	●	●	⊗	⊗	⊗	⊗	⊗	⊗	⊗
Infrastructure/ICT Adoption	●	●	●	●	●	●	●	●	⊗
Macroeconomic Stability	●		●	⊗		●	●	●	⊗
<i>Human Capital</i>									
Health & Education	●	●	⊗	●	⊗		⊗	⊗	●
<i>Markets</i>									
Product/Labour/Financial/Size	⊗	●	●	●	⊗	⊗		⊗	⊗
<i>Innovation Ecosystem</i>									
Business Dynamism/Innovation Capability	●	●	●	●	⊗	⊗	⊗		●
Consistency	0.942	0.998	0.931	0.916	0.999	0.997	0.999	0.998	0.999
Raw Coverage	0.358	0.777	0.292	0.205	0.559	0.448	0.472	0.519	0.214
Unique Coverage	0.046	0.476	0.011	0.058	0.083	0.028	0.014	0.058	0.041
<b>Overall Solution Consistency</b>	<b>0.949</b>				<b>0.997</b>				
<b>Overall Solution Coverage</b>	<b>0.925</b>				<b>0.701</b>				

*Source: Fabri and Cassar (forthcoming)*

Based on the findings in this section, Malta's way forward to enhance its competitiveness and move towards the high performers, involves investment in a number of areas. Malta would be more in line with the first set of combinations. Given its track record in high performance in terms of macroeconomic stability, Malta should work towards using this to achieve competitiveness through the confidence the economy it enjoys. Thus, the country should prioritise investment further in infrastructure in general and keep up to date as its currently doing in terms of ICT adoption. Investment in creating an innovative ecosystem should also be prioritised by investing in both human capital and market efficiency (labour, product, and financial) to move closer to the high performers. However, the country could prioritise more one

<sup>56</sup> Black circles ("●") indicate that the presence of the condition is high in relation to EU-27 countries, and open circles ("⊗") indicate that the presence of the condition is low in relation to EU-27 countries. Blank spaces indicate irrelevance of the condition to the solution.

of the latter areas in order to invest effectively. This does not mean for example that human capital should not be prioritised, however, while ensuring a stable educational system, priority in terms of human capital may be given in terms of investment in talent management and flexibility to enhance overall labour market efficiency.

### **3.7.2 Sustainable Competitiveness**

In line with the Global Competitiveness Index, another important competitiveness indicator is the Global Sustainability Competitiveness Index (GSCI). The latter index is based on 5 pillars which are measured through 116 quantitative performance indicators. In line with the GCI, it is important to review the GSCI because while the former index provides a holistic understanding of competitiveness based on an extensive number of indicators, the latter specifically focuses on how a country can remain competitive whilst safeguarding and ensuring social and environmental growth. This is crucial given the direction which the EU Member States are taking towards a sustainable green economy through the European Green Deal

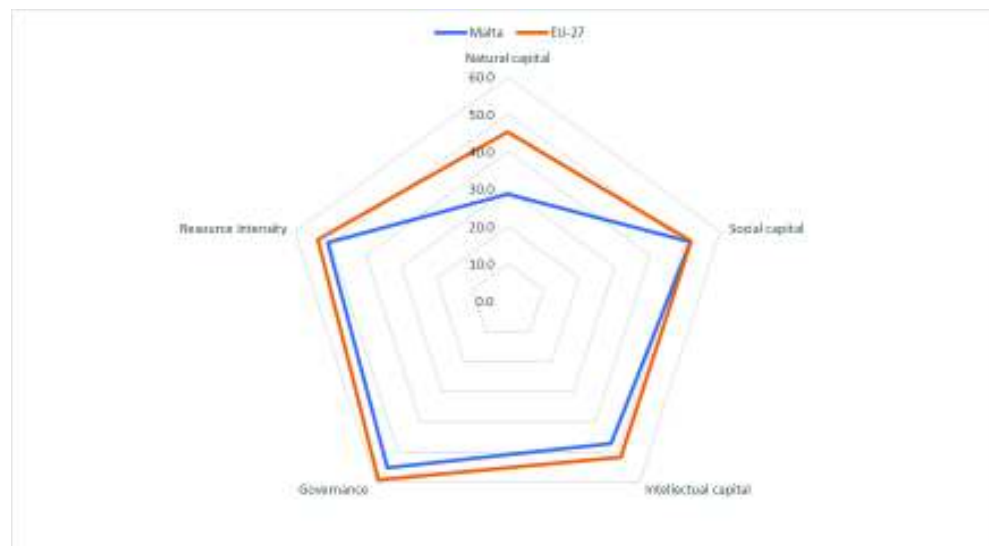
The GSCI is made up of five main indicators:

1. Natural capital: the level of the natural environment and available resources, including the level of depletion of resources – agriculture, biodiversity, water, resources, and pollution;
2. Social Capital: the level of health, security, freedom, equality, and life satisfaction;
3. Resource Management: the efficient use of resources as a measure of operational competitiveness – energy, water, and raw materials;
4. Intellectual Capital: ability to generate wealth and jobs through innovation and high value-added industries – education, R&D, new business;
5. Governance efficiency: outcome of core state areas and investments, namely, infrastructure, market and employment structure, the provision of a framework for sustained and sustainable wealth generation.

In comparison to the EU-27 average, Malta faces challenges in all of the sustainable competitiveness indicators as outlined in [chart 3.58](#). In fact, the overall index of the EU-27 stood at 52.21 in 2019, whilst that of Malta was 46.6. From all 180 countries

assessed in the GSCI, Malta ranks 53<sup>rd</sup> in this index, from the EU-27 countries, Malta ranks 26th followed by Cyprus.

**Chart 3.58 Global Sustainable Competitiveness Index, Malta and EU-27, 2019**



*Source: GSCI, 2020*

The challenges with regards to social capital, intellectual capital, governance, and resource intensity have been discussed in detail throughout this entire section. This, we shall not delve into these issues once again. With regards to natural capital, there is a huge discrepancy between Malta and the EU-27 average. In fact, globally Malta ranks 168<sup>th</sup>. This is mainly due to the country's smallness and limited availability of natural resources. These are inherent disadvantages that cannot be controlled. However, there are other aspects such as quality of agriculture, biodiversity, water and pollution that can be enhanced. These aspects related to natural capital and resource intensity are discussed in detail in Section 3.1, where we discuss Malta's role strengths, challenges, and opportunities within the context of the EU Green deal.

### Appendix 3.1 Explaining Fuzzy-Set Qualitative Comparative Analysis and the Measures

In Boxes 3.1, 3.2, 3.3, additional analysis of the respective section is enhanced by assessing variables using configurational approach based on fuzzy set-theoretic methods, using the programme fsQCA 2.0. The application of this technique in social science, but it has been recently picking up due to the fact that such method caters for the complex environment under which different economic aspect take place.

As a configurational tool, through set-theoretic methods it is possible to look simultaneously at multiple interactions, solving the issue of endogeneity. Set-theoretic methods allow for the analysis of equifinality (Fiss, 2007; Ragin, 2006), which refers to the phenomenon of different variables or combinations of variables leading to similar outcomes (Fiss, 2011). In addition, set-theoretic methods allow for the analysis of asymmetric reciprocal relations. That is, a separate analysis of different combinations leading to the high and low presence of the outcomes involved each respective study. Overall, at present, fuzzy-sets are considered to be one of the most adequate methods available to assess the complexities involved in policy and decision making (Zadeh, 1997).

**Table A.1: Description of Variables and Sources for Table 3.3**

Variable Name	Description	Source
Rate of early school leavers	Proportion of total population aged 18 to 24 who have completed at most a lower secondary level of education and are currently not involved in further education or training	Eurostat (2019)
GDP	Annual Gross Domestic Product (GDP) per person, measured at constant 2010 Euros (€), millions	Eurostat (2019)
Inequality	Gini coefficient denoting the distribution of income in each country. Measure ranges from 0 to 1, with 0 denoting perfect equality and 1 denoting perfect inequality	Eurostat (2019)
Youth unemployment	Proportion of the active population aged 18 to 24 who is currently unemployed	Eurostat (2019)



Adult educational background	Proportion of population aged 35 to 44 with a level of education equal to or below ISCED level 2	Eurostat (2019)
Adult professional status	Proportion of active population aged 40 to 59 who are either managers, professionals or technician and associate professionals	Eurostat (2019)

**Table A.2: Description of Variables and Sources for Table 3.11**

Variable Name	Description	Source
Innovation	Measures the availability of a high-skilled and educated workforce.	EU Innovation Scorecard
Human resources	Measures the availability of a high-skilled and educated workforce.	EU Innovation Scorecard
Research systems	Measures the international competitiveness of the science base	EU Innovation Scorecard
Innovation-friendly environment	Environment in which enterprises operate and includes two indicators - Broadband penetration among enterprises and Opportunity-driven entrepreneurship	EU Innovation Scorecard
Financial and support	Measures the availability of finance for innovation projects by Venture capital expenditures, and the support of governments for research and innovation activities by R&D expenditures in universities and government research organisations.	EU Innovation Scorecard
Firm investment	Three indicators of both R&D and non-R&D investments that firms make to generate innovations, and the efforts enterprises make to upgrade the ICT skills of their personnel.	EU Innovation Scorecard
Innovators	Includes three indicators measuring the share of firms that have introduced innovations onto the market or within	EU Innovation Scorecard

Linkages	their organisations, covering both product and process innovators, marketing and organisational innovators, and SMEs that innovate in-house. Includes three indicators measuring innovation capabilities by looking at collaboration efforts between innovating firms, research collaboration between the private and public sector, and the extent to which the private sector finances public R&D activities.	EU Innovation Scorecard
Intellectual assets	Captures different forms of Intellectual Property Rights (IPR) generated in the innovation process, including PCT patent applications, Trademark applications, and Design applications.	EU Innovation Scorecard

**Table A.3: Description of Variables and Sources for Table 3.13**

Variable Name	Description	Source
Institutions	Pillar 1 of the GCI.	WEF
Infrastructure/ICT Adoption	Average of Pillars 2 and 3 of the GCI.	WEF
Macroeconomic Stability	Pillar 4 of the GCI.	WEF
Health & education	Average of Pillars 5 and 6 of the GCI.	WEF
Product/Labour/Financia/Market Size	Average of Pillars 7-10 of the GCI.	WEF
Business Dynamism and Innovation Capability	Average of Pillars 11 and 12 of the GCI.	WEF

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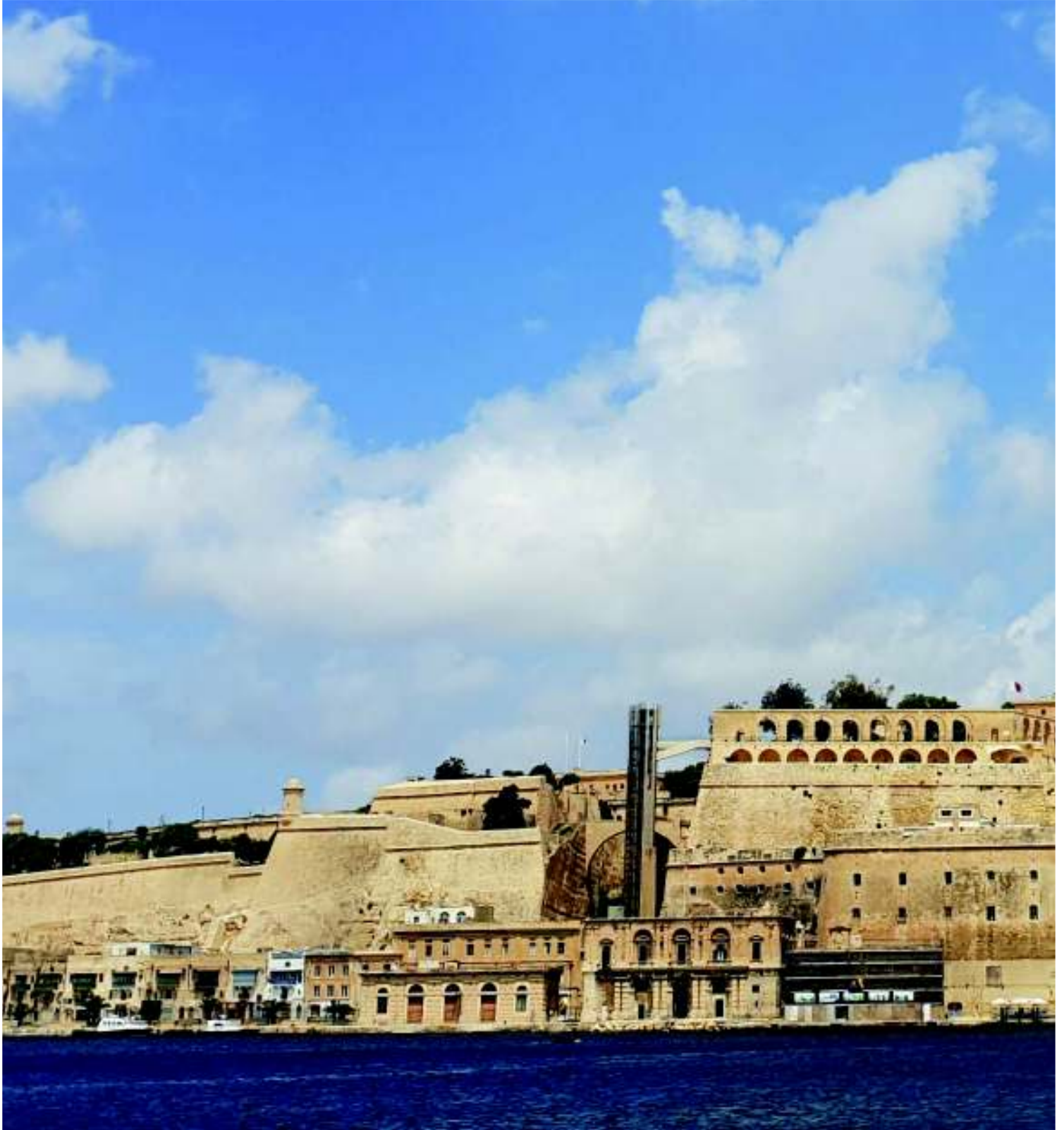
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# Chapter 4

## Key drivers of productivity



#### **4.1 Productivity as a key driver of economic growth**

Productivity is a key driver of economic growth, which underpins the need to provide econometric evidence of its key determinants. The aim of this chapter is to determine whether there is a causal link between foreign direct investment (FDI) and total factor productivity (TFP) across the EU-28 Member States. The methodology applied allowed for all 28 EU Member States to be covered, which is explained further in the appendices. Covering all 28 Member States (now 27) was deemed relevant given that in our view the determinants of productivity are not necessarily specific to one Member States and also require both national (country specific) and EU policy responses.

The methodology used is panel data analysis covering the period 2004 to 2017, relating TFP to FDI as well as various other important economic and institutional correlates. To account for potential endogeneity between TFP and FDI, an instrumental variable framework specific to this model was deployed by using variations in corporate tax rates.

The empirical results confirm that average effective corporate taxes are strongly and negatively related to FDI. In turn, FDI is an important and positive determinant of TFP, with the results suggesting that a 1.0% increase in FDI leads to a 14.0% increase in TFP. The results are robust to the use of different measures of corporate tax rates, as well as alternative measures of TFP. These results are highly relevant with regards to policies aimed at enhancing productivity, especially in the light of the role of FDI as a tool to enhance medium and long-term economic growth. The theory states that inward FDI into a country can, among other things; stimulate growth by creating new jobs and by causing technological spill overs. For this reason, governments deploy policies including fiscal measures in order to attract capital from foreign investors by setting, for example, competitive tax rates. Further on, based on the regression results described later, it can be concluded that the hypothesis is consistent with theory.

The corporate income tax is one of a number of variables which influences the location of new investment by companies. Additionally, good governance that protects investors and entrepreneurs against expropriation and trade openness also influence the degree of investment a country will receive. This implies that a country like Malta, situated at the periphery of the EU, should give priority to policies that aim to attract FDI, particularly those that help boost productivity.



## 4.2 Cross-country differences in productivity

Global debates on cross-country differences in economic development are largely the consequence of differences in productivity levels. In effect, productivity is recognised as a key determinant of sustained economic growth. Indeed, the academic evidence supporting this viewpoint is unambiguous – for example Cao & Birchenall (2013) show how improvements in agricultural productivity in China contributed to substantial output and employment growth, not just within the agricultural sector but within the economy as a whole and across different sectors. Similarly, Bloom et al (2004) find that productivity gains from one extra year of life expectancy raises aggregate output by around 4.0%.

It therefore comes as no surprise to note that productivity is emphasised by economists, employers and the public alike. Of course, the monitoring of any movements in productivity across countries is equally as important given that productivity enhances the competitiveness of economies. The EU is no different, with each Member State having its independent National Productivity Boards in order to track productivity and overall competitiveness within their respective countries. This in part reflects growing concerns that productivity growth within the EU has been declining relative to other major economies – for example, in 2016 Euro Area productivity growth was around 0.5%, below other countries like the U.S. and a far cry from the circa 2.0% growth recorded in 1995 (Draghi, 2016), with important long-term implications for external competitiveness. What will happen in the aftermath of COVID-19 in terms of competitiveness across the EU and in the case of the Maltese economy is very difficult to predict but it is plainly obvious that without policies and measures aimed at enhancing productivity, the economic prospects of any economy would be seriously undermined.

Various factors have been identified in order to explain variation in productivity across countries, including the intensity of research and development activities and innovation (Griffiths et al, 2006), government finances (Salotti & Trecroci, 2016), trade openness (Acala & Ciccone, 2004) and various regulatory and political regimes (Egert, 2016). Nonetheless, one of the key determinants of productivity that has been consistently identified within the economics literature is FDI, with authors like Haskel et al (2007) finding a positive and significant correlation between the two variables across different economic contexts.

This relationship may operate through a variety of channels; for example, Smarzynska Javorcik (2004) finds that FDI leads to higher productivity through knowledge spillovers from foreign businesses, while Li et al (2001) report that FDI also leads to productivity gains by increasing competition with domestic firms, particularly in the case of multinational corporations. In fact, various economies around the world have explicitly targeted FDI inflows by foreign corporations, through various incentives, in order to boost domestic productivity.

However, despite the plethora of studies that focus on the role played by FDI in terms of influencing the level of productivity within a country, these studies often fail to take into account the fact that productivity may also to some extent determine the level of FDI within a country. Given this potential endogeneity issue, it is plausible that existing studies on the impact of FDI on productivity may be biased and are thus failing to capture the true extent of this important relationship. Against this background, the Spiteri & von Brockdorff (2020) study reconsiders the impact of FDI on productivity by accounting for potential reverse causality between the key variables of interest.

For this purpose, TFP across the EU-28 countries over the period 2004 to 2017 is related to holdings of foreign assets within each country, together with various other determinants of productivity as identified in the literature, including expenditure on research and development, size of government and trade openness. To deal with the endogeneity issue, an instrumental variables approach is deployed, by referring to variations in corporate tax revenues (as a proportion of total taxes) in order to identify change in annual foreign assets held within a country. The empirical results indicate that a strong, negative and statistically significant relationship exists between corporate taxation and FDI in the EU.

Further empirical results confirm the positive and significant impact of FDI on TFP, with a 1.0% increase in FDI yielding a 0.32% increase in productivity on average across the EU. Also, relevant correlates of productivity were other variables like the number of patents acquired per year, economic freedom and immigration.

As for economic freedom, this implies that there is freedom to prosper within a country without intervention from government or economic authority. Individuals are free to secure and protect his/her human resources, labour and private property. Economic freedom is expected in a market-oriented economy.



The results of the study are robust to different specifications, including alternative measures of both corporate taxation and productivity. These findings have clear implications for pan-European economic policy, as well as for country specific policies, and the important role of FDI in boosting domestic productivity, particularly in Member States with below average levels of productivity.

### **4.3 Total Factor Productivity**

Traditionally, total factor productivity (TFP) has been considered as the Solow residual in neoclassical production functions, whereby growth in TFP drives long-term growth in per capita income (Solow, 1957; Caselli, 2005). Predictably, this spawned a substantial literature on uncovering the key factors which may influence TFP growth over time. Key determinants include innovation and technological diffusion (Aghion & Howitt, 2006), human capital (Vandenbussche et al, 2006), trade openness (Miller & Upadhyay, 2000), investment (Geylani & Stefanou, 2013) and institutional factors like economic governance and rule of law (Hall et al, 2010).

Jona-Lasinio et al (2019) modelled TFP in Europe as a function of various explanatory variables over the period 1981 to 2014. The results indicate that research and development (R&D) expenditures, the share of industry in total Gross Value Added, investment, economic freedom and trade openness are all key positive and significant determinants of TFP in Europe, while on the flipside government expenditure is negatively-correlated with productivity, across several specifications.

Several other authors have specifically focussed on the role played by FDI in influencing TFP growth within a country. From a theoretical perspective, FDI flows propagate positive shocks to TFP via technological and knowledge spill overs which are then absorbed by the domestic economy, resulting in higher levels of income per capita as per standard real business cycle models of growth (Comin, 2010).

From an empirical perspective, various authors have reported a positive and statistically-significant relationship between FDI flows and TFP (e.g. Tuan et al, 2009; Cipollina et al, 2012), although some have cautioned against making sweeping predictions since this may depend on a number of factors, including the absorptive

capacity of the recipient economy (Girma, 2005), as well as the extent to which domestic financial markets are well-developed (Alfaro et al, 2009).

Nonetheless, one of the major shortcomings within this empirical literature is the potential endogeneity bias that exists between productivity and its key determinants, notably FDI. Indeed, a number of authors (Jackson & Markowski, 1995; Hailu, 2010; Todtenhaupt & Voget, 2017) have found that domestic levels of productivity are a key consideration for businesses seeking to relocate, expand or commence their operations in a foreign country, since this would lead to higher and quicker potential returns given the ability to produce more output while utilising fewer resources. This endogeneity issue is important, since failure to account for this issue may signify that existing empirical results on the assumed relationship between FDI and TFP are potentially biased.

It is necessary therefore to account for endogeneity in the regression model as referred to in Spiteri & von Brockdorff (2020) by employing an Instrumental Variables approach. More specifically, this requires a variation in FDI through changes in corporate tax rates across countries and over time. The focus is the relationship between FDI and corporate taxes, which has generated considerable debate over the years. For example, Bellak & Leibrecht (2009) find that effective corporate tax rates are negatively and significantly-related to FDI flows in a sample of Central and Eastern European countries, echoing earlier findings on a similar relationship derived for 11 OECD countries by Bénassy-Quéré et al (2005) and across U.S. states (Agostini, 2007), with Djankov et al (2010) confirming this relationship across a sample of 84 countries across the world.

In the same vein, Hansson & Olofsdotter (2010) also finds a negative correlation between corporate taxes and FDI in the EU, although this relationship is largely prevalent for the new EU Member States as opposed to the old guard. Nonetheless, it is important to note that not all studies confirm this relationship; for example, Hunady & Orviska (2014) find no statistically significant association between corporate taxes and FDI in the EU, similar to Kubicova (2013).

From a conceptual viewpoint, such a relationship reflects the fact that higher corporate taxes reduce the net profitability or returns on capital, thus encouraging multinationals to relocate to lower-tax jurisdictions provided that the marginal cost of relocation does

not exceed the marginal increase in net profits due to lower taxes (e.g. Becker et al, 2012). Nonetheless, it is also possible that corporate tax differentials across countries is an equilibrium outcome due to market imperfections, resulting from various factors like economies of scale (e.g. Haufler & Wooton, 1999), which would thus not necessarily affect FDI. Thus, although the evidence suggests that a negative correlation exists between corporate taxation and FDI, this is by no means unanimous, particularly in relation to the EU.

#### **4.4 The relationship between TFP and FDI**

In identifying the key factors determining productivity it is necessary to establish the empirical relationship between TFP and FDI, together with various other explanatory variables. The baseline regression closely follows those specified in Jona-Lasinio et al (2019) and Cipollina et al (2012), building on the RBC theoretical foundations of TFP growth determinants as well as several versions of the canonical Romer model of economic growth (e.g. Jones, 1995; Ngai & Pissarides, 2007). The potential endogeneity issues by adopting an Instrumental Variables approach to estimation was a unique approach in the 2020 study, where the identification strategy relied on variation in corporate tax rates in order to capture differences in FDI. Thus, it was possible to obtain a much clearer picture of the causal link between TFP and productivity.

The study used panel data and covered all EU Member States (including UK with a time frame covering 2004 to 2017). The variables explaining variations in TFP were deemed to be Stock of Foreign Direct Investment (assets) per capita, expressed in euro; Total Research & Development Expenditure per capita; Number of patent applications per million inhabitants; Proportion of Gross Value Added (GVA) generated by the manufacturing sector, a sector in which productivity can be easily measured and in turn contributes significantly to GVA; Government expenditure as a proportion of GDP indicating the extent of government spending to support public health, education, social protection etc; Ratio of imports and exports to GDP indicating the extent of trade openness; Index of Economic Freedom; and Rule of Law Governance Indicator; both these last two variables are deemed relevant given that there is some evidence of a connection between the rule of law and economic growth.

However, it is legitimate to ask how the rule of law can affect the general propensity to invest. Investment, in particular long-term investment, will only take place if potential investors expect the investment environment to remain favourable over many years. The rule of law plays a crucial role in a government's ability to offer such a stable environment. To ascertain the rule of law's effects on economic growth, it first needs to be measurable. However, this is no mean feat as it is a multidimensional concept and various difficult coding decisions need to be made, such as whether all dimensions should be given the same weight. This is why the 2020 study uses two indicators: the Index of Economic Freedom and the Rule of Law governance indicator.

The next two variables deemed relevant are GDP per capita, at constant 2010 prices, indicating changes in the level of economic growth; and domestically owned stock of assets per capita indicating changes in the wealth creation in the economy. No doubt there are always country-specific unobservable effects affecting TFP and these were also considered in the study.

#### **4.5 What do the results say and their implications**

The results suggest that a 1.0% increase in FDI stock within a country is associated with a rise in TFP of 0.016 points, equivalent to a 9.4% increase relative to its mean. Other positive correlates of TFP are R&D spending, patent filings (which collectively capture innovation and investment in new technologies), the size of the domestic manufacturing sector and government expenditure. This latter finding is consistent with recent findings on the role of government programmes and spending on boosting TFP and economic growth in developed economies (Dar & Amirkhalkhali, 2017).

There is no question that the COVID-19 crisis has brought to light the significance of the role of governments in tackling health and economic crises. This too is particularly relevant to the objective of enhancing TFP via FDI. It is increasingly evident that governments play a key role in setting economic direction, more so in a crisis. Fiscal policy, as explained earlier, is vital not just for economic stability but equally to enable governments to support businesses by way of incentives, as allowed under EU legislation. Clearly, efforts to enhance TFP requires government direction and incentives be they of a fiscal nature or otherwise.

Though no statistically-significant relationship between TFP and the institutional variables denoting economic freedom and rule of law were found in the study, which may in part be due to the fact that the sample consisted solely of EU Member States, with any variations potentially subsumed by the country fixed effects, the importance of both economic freedom and rule of law cannot be downplayed. Also, no significant relationship was found between domestic investment stock and TFP but this was probably due to the fact that this was already captured by the impact of innovation and R&D spending.

As mentioned earlier it was necessary to identify potential endogeneity between TFP and FDI by implementing our instrumental variables framework, with average effective corporate taxes used to identify variation in FDI stocks. The results are shown in the Appendix (see [table 4.4](#)) where Panel A shows the second-stage coefficient estimates, while Panel B shows the first-stage regression results for equation (2).

The results are highly relevant. The coefficient of the effective corporate taxation is negative and highly significant, indicating that higher levels of (effective) corporate taxes are linked with lower levels of FDI within the sample. The point estimate suggests that a one percentage point increase in the average effective corporate tax rate is associated with a 5% decrease in FDI stock per capita on average, which underscores the role of corporate taxation in influencing the level of foreign investment within a country. The estimated elasticity of FDI with respect to corporate tax (-5) is somewhat higher than that obtained by Hansson & Olofsdotter (2010) for the EU-27, which was estimated at -3, which indicates that this relationship may have become even stronger in recent years, particularly in the post-2008 crisis period. Again, this reinforces the argument of competitive corporate taxation as an attraction for FDI. This is relevant for any country but especially for a country that lies in the periphery of the EU as is the case for Malta.

Turning to the second-stage regression, the results show that FDI has a positive and significant impact on TFP. A 1.0% increase in FDI per capita leads to a 14.7% increase in TFP, thus showing the importance of FDI when it comes to domestic levels of productivity. Once again, R&D spending, patent filings, the share of manufacturing in total GVA and government spending are all positively and significantly correlated with TFP. The only notable difference is that economic freedom, one of our institutional variables, is negatively and significantly correlated with TFP, although this is likely due

to multicollinearity issues between our institutional variables since economic freedom is strongly correlated with rule of law.

The results highlight the causal impact of FDI on TFP within the EU, and in turn the role played by competitive corporate taxation as both a potential facilitator and inhibitor of FDI and TFP growth. The results thus reveal how a change in corporate taxation may have direct effects in terms of a country's ability to attract foreign investment, with important implications for domestic productivity levels and hence future economic prosperity.

The results also support the evidence that firms which attract flows of investment from overseas corporations (inwards investment) are widely thought to benefit from increased investment, access to technology and expertise, as well as stronger management and organisational practices (Office of National Statistics, UK, 2017).

There is in fact strong evidence to suggest that the presence of (inward) FDI has a positive relationship with the productivity of domestic firms and raises productivity levels for the host country as a whole. This may reflect domestic firms benefitting from technology transfer and knowledge spill overs, through horizontal or vertical linkages. Horizontal spill overs refer to spill over effects of FDI on domestic firms within the same industry. This type of spill over can occur through imitation – copying technologies used by FDI firms – or labour mobility, involving workers moving from FDI firms to domestic firms and transferring acquired knowledge and skills. The entry of FDI firms into an industry has also been found to increase competition and productivity, by forcing domestic firms to increase their efficiency in order to remain competitive, and/or by forcing unproductive firms to exit the market (Blomström, 1986, Griffith and others 2002). Such considerations cannot be overlooked in setting policies aimed at attracting FDI.

Spill overs also diffuse across industries through interactions within the supply chain, known as vertical spill overs. Backward or upstream spill overs involve efficiency gains by firms which supply intermediate products to foreign owned clients. This spill over mechanism could take the form of higher standard of requirements from FDI firms, forcing local producers to implement new technology or improved processes; direct knowledge transfer from foreign clients to domestic suppliers; increased demand for intermediate products enabling domestic suppliers to expand production and benefit

from scale economies. Similarly, in the forward or downstream supply chains, domestic firms could benefit from improved intermediate products and services and/or cheaper inputs from FDI firms as suppliers.

The Office of National Statistics, UK, 2017 study shows that the productivity of the median FDI firm is around twice that of the non-FDI firm whereas the productivity of the average FDI firm is around three times that of the non-FDI in 2015. Keeping size, industry, time and region constant, firms with inward FDI were 74.0% more productive than non-FDI firms; taking other directions of FDI flows into account, the study also found higher productivity outcomes among firms with outward than inward FDI, with the highest productivity outcomes among firms with both inward and outward FDI flows. Though the study found significant variation in productivity outcomes between FDI and non-FDI firms in the same industry, again the link between FDI and productivity appears to be strong and irrefutable.

#### **4.6 Conclusion**

This chapter has determined the relationship between foreign direct investment (FDI) and productivity in the EU, with a particular focus on how competitive corporate taxation can play a key role in underpinning the mechanics of this relationship. A panel dataset from the EU-28 on total factor productivity (TFP) as used in a 2020 study was the basis of the results referred to in this chapter. The objective of this study was to relate TFP to FDI stocks as well as various economic and institutional correlates, spanning the period 2004 to 2017. Potential endogeneity between TFP and FDI was accounted for by employing an instrumental variables strategy, whereby effective corporate taxes were used in order to identify variations in FDI.

The results show that corporate taxation is strongly and negatively related to FDI. Moreover, we find that FDI has a significant impact on TFP across Europe, with our estimates suggesting that a 1% increase in FDI is associated with a 14% increase in TFP. The results proved to be robust given that different taxation measures as well as the use of different measures of TFP were employed.

The results may also contribute to the current debate on the alignment of tax policy across the EU in a number of ways and provide justification for competitive corporate

tax rates across those EU Member States where productivity is lagging behind the EU average, notably nations that joined the EU in 2004 and later, in order to enable them to catch up to EU levels of economic prosperity and living standards.

Against this background, it is deemed necessary for the European Commission to conduct a comprehensive impact assessment on a country-by-country basis. The impact needs to be quantified and this would also need to assess how FDI and in turn productivity could be affected. This is particularly relevant in Malta where Research Development and Innovation (RDI) is well below EU targets. In fact, Malta is one of the countries with the lowest share of research, development and innovation (RDI) expenditure of GDP in the EU. Most of the RDI is imported. R&D as a per cent of GDP remains well below the national target for 2020 (2 per cent). The headline target for the EU (as per Europe 2020) is of an investment rate of 3 per cent of GDP. Malta's position becomes more disconcerting, when it is considered that the 2020 target is likely to be achieved well before end 2020 by other EU countries.

The EU Innovation Scoreboard 2013 ranks Malta 20 out of 27 Member States, and the latest figures show that Malta has not made any real progress. It is very evident that RDI performance needs to improve substantially. In fact, Malta is only considered a 'moderate innovator' with below average performance. The share of Government budget appropriations or outlays on research and development as a percentage of total government expenditure allocated to RDI also remains one of the lowest in the EU where the average stands at an estimated 1.47 per cent.

Finally, it should also be noted that there exist significant and persistent differences in productivity across Member States and the critical factor is differences in TFP with the determinants of TFP being education, health, infrastructure, institutions, openness, competition, financial development, geographical predicaments and absorptive capacity (including capital intensity) appear to be the most critical determinants of TFP (Isaksson (2007)). Hence it is necessary to increase investment in human capital and innovation in order to support productivity, particularly in Member States where productivity is currently lagging the EU average.

Again, with a focus on the Maltese Islands, it is pertinent to refer to study by von Brockdorff & Amaira (2017) which estimated the human capital stock for Malta over the period 2005 to 2013 compared compare Malta's performance with that of other



countries. The main conclusion of this study is that the human capital stock of Malta grew by 70% in nominal terms from 2005 to 2013 whereas the nominal average annual growth rate was approximately equal to 7.0%. The real human capital stock grew by 32% over the same period. The real change in human capital was attributed to a 2.0% increase in the labour force population and a 1.0% increase in real lifetime income per capita. This study showed that despite the improvement in human capital in Malta over the period analysed, the percentage of youths who opt to leave school without having the necessary qualifications remains a problem as is the need to address skills mismatches and re-skilling of older workers.

#### Appendix 4.1 The Model

The equation shown below estimated for the EU-28 Member States, with data covering the period 2004 to 2017. Detailed descriptions regarding each variable, as well as summary statistics, are provided in Tables 1 and 2. The dependent variable, TFP, is calculated using growth accounting from a standard Cobb-Douglas production function, described below:

$$Y_{it} = TFP_{it} K_{it}^{0.35} L_{it}^{0.65}$$

Where  $Y_{it}$  is GDP (at constant 2010 prices),  $K_{it}$  is capital input (total value of physical capital stock, at constant 2010 Euro millions) while  $L_{it}$  is labour input (total annual labour hours). The production function is an equation that describes the relationship between input and output, or what goes into making a certain product, and a Cobb-Douglas production function is a specific standard equation that is applied to describe how much output two or more inputs into a production process make, with capital and labour being the typical inputs described. The equation for the Cobb-Douglas production formula as shown above has constant returns to scale, and it would thus be considered linearly homogeneous. It should be noted that capital indicates the real value of all machinery, parts, equipment, facilities, and buildings while labour accounts for the total number of hours worked within a timeframe by employees.

The respective output elasticities for capital and labour are derived from Harvik et al (2014), given that they are used by the European Commission to calculate

potential output in the EU. The measure of FDI is the value of foreign assets held within the domestic economy, expressed in per capita terms. It is the stock of foreign assets that is used as an estimate of foreign assets, as opposed to the net annual flow, in order to account for potential foreign ownership of assets funded by domestic financial markets (Devereaux & Griffiths, 2002), which would not be captured by FDI flows.

In addition, stocks of FDI are considerably less volatile than flows in any given year, particularly in smaller countries, and reflect the global allocation of capital resources across countries (Bénassy-Quéré et al, 2005). The remainder of the controls follow from the literature, containing a mixture of economic and institutional variables, with full descriptions provided in Table 1, together with summary statistics in Table 2. Equation (1) is estimated using a Fixed Effects (FE) specification in order to account for unobserved, time-invariant country-specific heterogeneities across our sample of EU Member States.

**Table 4.1 Description of Variables**

Variable	Description	Source(s)
TFP	Total Factor Productivity, derived as the Solow residual from Cobb-Douglas production function	Eurostat (2019a, b), for labour and capital inputs
FDI per capita	Stock of foreign assets held within each country, expressed in per capita terms (Euro)	Eurostat (2019c)
R&D expenditure	Total Research & Development Expenditure per capita (in Euro)	Eurostat (2019d)
Patents	Number of patent applications per million inhabitants	Eurostat (2019e)
Manufacturing GVA	Proportion of Gross Value Added generated by the manufacturing sector	Eurostat (2019f)
Government Expenditure	Government expenditure as a proportion of GDP	Eurostat (2019g)

Trade Openness	Ratio of imports and exports to GDP	Eurostat (2019h)
Economic Freedom	Index of Economic Freedom, incorporating business freedom, trade freedom, investment freedom and property rights.	Heritage (2019)
Rule of Law	Index denoting the extent to which contracts are enforced, property rights protected, and the incidence of violence and crime.	Worldwide Governance Indicators (2019)
GDP per Capita	GDP per capita, at constant 2010 prices (Euro)	Eurostat (2019i)
Investment	Domestically-owned assets, expressed in per capita terms (Euro)	Eurostat (2019j)

**Table 4.2 Summary Statistics**

Variable	Mean	Std. Dev.	Min	Max
TFP	0.170	0.076	0.052	0.438
FDI per capita	0.521	2.320	0.001	18.869
R&D expenditure	1.491	0.875	0.340	3.750
Patents	86.147	97.323	0.800	350.410
Manufacturing GVA	0.204	0.061	0.061	0.386
Government Expenditure	0.198	0.027	0.141	0.279
Trade Openness	1.200	0.674	0.456	4.164
Economic Freedom	68.614	6.217	50.000	82.600
Rule of Law	1.131	0.611	-0.170	2.100

GDP per Capita	0.025	0.016	0.004	0.085
Investment	0.003	0.011	0.000	0.063

In view of the potential endogeneity issue between the dependent variable and key explanatory variable of interest, to address this problem, the chosen approach was to use variations in cross-country effective corporate tax rates over time in order to identify changes in FDI stocks. It has already been mentioned that several studies have found that corporate taxation is a key determinant of FDI (e.g. Djankov et al, 2010), with most empirical findings suggesting that the two variables are negatively correlated, both over time and across countries. The first-stage regression is specified as follows:

$$\ln FDI_{it} = \delta_0 + \delta_1 Tax_{it} + \alpha_i + \varepsilon_{it} \quad (2)$$

Where:

$i$  = Country (where  $i = 1, 2, \dots, 28$ );

$t$  = Year (where  $t = 2004, 2005, \dots, 2017$ );

$\ln$  = Natural logarithm;

$FDI_{it}$  = Stock of Foreign Direct Investment (assets) per Capita, expressed in Euro, in Country  $i$  for Year  $t$ ;

$Tax_{it}$  = Effective corporate tax rate (in % terms) in Country  $i$  for Year  $t$ ;

$\alpha_i$  = Country-specific unobservable effects;

$\varepsilon_{it}$  = Random disturbance term.

The effective average corporate tax rates is deployed as the tax variable, similar to Hunady & Orviska (2014), using the Devereux-Griffith methodology of computation (Devereux & Griffiths, 1998; 2003). Effective corporate tax rates are considered to be a more accurate reflection of the tax expenditure incurred on capital investment since they capture a multitude of factors like real and nominal interest rates, allowances on depreciation of assets and other potential country-specific tax incentives.

It is presumed that corporate taxes affect TFP solely via its impact on FDI. The literature on the relationship between corporate taxes and productivity, and in particular the possible channels through which the former may influence the latter,

is somewhat scant, particularly at the macro level. From a theoretical point of view (Auerbach & Hines, 2002), corporate taxes may distort the efficient allocation of productive inputs across industries and countries, which may in turn influence the extent to which certain inputs are utilised, and thus TFP in general.

At the micro level, Vartia (2008) identifies two possible channels through which corporate taxation may influence productivity in the OECD, namely investment in new entrepreneurial undertakings and research and development expenditure, with these effects particularly pronounced in industries with high levels of profitability. Gemmell et al (2010) extend this analysis, finding that innovation underpins much of this relationship, with the strongest negative effect of corporate taxation observed in high innovation industries, mainly due to its adverse impact on investment expenditure, which lines up with empirical findings on statutory corporate tax cuts across Canadian provinces (Dahlby & Ferde, 2012). More recent work using firm-level micro data further confirm the idea that corporate taxation affects productivity by altering incentives to invest, be it in terms of cross-country allocations of assets following mergers and acquisitions (Todtenhaupt & Voget, 2017) or in terms of productivity-enhancing assets within firms (Gemmell et al, 2018).

The empirical evidence suggests that corporate taxation affects TFP via investment expenditure, with innovation also playing a potential role. These findings also point towards the need to control for other important variables closely related to both corporate taxation and TFP, namely domestic investment and innovation. This was done in the 2020 study as seen in Equation (1) and helped isolate the mechanism through which FDI affects TFP through differences in corporate taxation. All this provides justification to the argument that correlates corporate taxation and productivity, via FDI.

#### **Appendix 4.2 Panel Results**

The linear relationship between TFP and FDI is expressed in equation (1), controlling for several other economic and institutional correlates of TFP. The results are shown in Table 3, where the results from a univariate regression of TFP on FDI, and the full specification including all control variables (all using the FE model) are

shown. As seen below, in both cases the stock of FDI is positively and significantly-related to TFP.

**Table 4.3 Baseline Panel Regression Results**

Variable	(1)	(2)
Log FDI	0.016*** (0.004)	0.016*** (0.005)
R&D expenditure		0.011** (0.005)
Patents		0.0002** (0.000)
Manufacturing GVA		0.091* (0.053)
Government Expenditure		0.208*** (0.072)
Trade Openness		0.0001 (0.008)
Economic Freedom		-0.001 (0.0004)
Rule of Law		0.001 (0.008)
Log GDP per Capita		-0.01 (0.016)
Investment		0.118 (0.062)
Constant	0.219*** (0.011)	0.132** (0.062)
Fixed Effects	Y	Y
N	392	392
R-squared	0.78	0.71

**Notes:** Robust standard errors are shown in parentheses. \*\*\* denotes statistical significance at the 1% level; \*\* denotes statistical significance at the 5% level; \* denotes statistical significance at the 10% level.

**Table 4.4 IV Panel Regression Results**

Variable	(1)	(2)
<b>Panel A – Second-Stage Regression</b>		
Log FDI	0.0201*** (0.004)	0.025*** (0.009)
R&D expenditure		0.010*** (0.003)
Patents		0.0001*** (0.000)
Manufacturing GVA		0.117*** (0.039)
Government Expenditure		0.190*** (0.046)
Trade Openness		-0.008 (0.010)
Economic Freedom		-0.001*** (0.0003)
Rule of Law		0.002 (0.004)
Log GDP per Capita		-0.024 (0.017)
Investment		0.548 (0.781)
Constant	0.233*** (0.013)	0.125*** (0.037)
N	392	392
R-squared	0.78	0.69
<b>Panel B – First-Stage Results</b>		
Average Effective Corporate Tax Rate	-0.054*** (0.007)	
Constant	-1.959*** (0.159)	
N	392	
R-squared	0.155	

**Notes:** Robust standard errors are shown in parentheses. \*\*\* denotes statistical significance at the 1% level; \*\* denotes statistical significance at the 5% level; \* denotes statistical significance at the 10% level.

#### Appendix 4.3 Robustness Checks

Given the nature of the analysis, a series of tests was run in order to ascertain the robustness of the estimates obtained in the previous section. The first test involves using two alternative instruments, namely the statutory corporate tax rate and the implicit tax rate. The rationale behind this test is that although several authors in the literature have emphasised the need to consider effective tax rates (e.g. Devereux & Griffith, 2001), one should still expect to observe a negative relationship between other measures of corporate tax and FDI, provided that this relationship is non-spurious and reflective of reduced potential returns on investment.

In fact, other authors (e.g. Hunady & Orviska, 2014) have utilised multiple measures of corporate taxation as correlates of FDI. Therefore, panel IV regressions in Table 4, were based on the statutory corporate tax rate and the implicit tax rate. The statutory corporate tax rate is the legally-mandated rate of taxation payable on business profits (excluding any allowances or incentives), while the implicit tax rate is similar to the effective tax rate in that it incorporates deductions and incentives, expressed as a percentage of the estimated tax base.

The results are shown in Table 5 where coefficients for FDI, the explanatory variable are shown. As seen below, the results using either statutory or implicit tax rates as the instruments yield markedly-similar results to those obtained in Table 4 where the average effective corporate tax was used. In both cases, the relationship derived from the first-stage regression (Panel B) is negative and statistically-significant, while the magnitude of the causal link between FDI and TFP in the second-stage (Panel A) is positive, significant and of similar magnitude as before. This finding further underscores the negative impact that corporate taxation has on FDI, regardless of the actual measure used, and in turn the positive effect of FDI on productivity.



#### Appendix 4.4 Further Panel Results

**Table 4.5 – Panel Regression Results using Statutory and Implicit Taxes**

Variable	(1) Statutory Taxes	(2) Implicit Taxes
<b>Panel A – Second-Stage Regression</b>		
Log FDI	0.028*** (0.009)	0.111*** (0.009)
Controls	Y	Y
Fixed Effects	Y	Y
N	392	392
R-squared	0.68	0.69
<b>Panel B – First-Stage Results</b>		
Statutory Tax Rate	-0.048*** (0.007)	
Implicit Tax Rate		-0.017*** (0.069)
Constant	-1.987*** (0.157)	-2.838*** (0.069)
N	392	364
R-squared	0.125	0.014

Notes: Robust standard errors are shown in parentheses. \*\*\* denotes statistical significance at the 1% level; \*\* denotes statistical significance at the 5% level; \* denotes statistical significance at the 10% level. In column (2) the number of observations is smaller since implicit tax data for Croatia and Malta were unavailable.

The second robustness test involves using an alternative measure of productivity. More specifically, TFP was derived from a standard Cobb-Douglas production function for the EU-28 as detailed earlier. An alternative approach to the TFP estimation is to employ a different measure of TFP estimated by the EU

Commission's Directorate-General for Economic and Financial Affairs, as part of the AMECO series.

By re-running the panel IV regressions in Table 4, using the alternative measure of TFP, as shown in Table 6, the results indicate that a 1% increase in FDI is associated with an increase in TFP of 14.5 points, which corresponds to a 14.2% increase, thus almost identical to the results obtained earlier in Table 4, and further underscoring the importance of FDI for TFP, regardless of the measure of productivity.

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# Chapter 5

## Recommendations

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## 5.1 Labour Productivity and Human Capital

Productivity can be measured at different levels, e.g. at the macro-level (whole economy); economic sector (manufacturing, ICT); company, organisation or work unit, employee or occupational group; or individual level. Aggregate productivity is that part of productivity growth that cannot be explained by an increase in the amount of 'traditional' factor inputs (labour, capital, raw materials, and energy). It comes about as the result of such things as technological development, training of workers, organisational development or improvements in management and production methods.

However, these are as important as productivity gains in the factor inputs and may compensate for the increase experienced, prior to COVID-19, in the number of low-productivity jobs, which has been a factor contributing to slower productivity growth. Productivity growth has been fastest in the few technology-driven businesses present in our economy. However, these businesses' share in total output remains small. If these firms had a larger share in value added, they would contribute more to productivity and real earnings growth in our economy. These firms, especially those in manufacturing could also be potentially involved in innovation, possibly in support of larger scale production overseas.

Weak productivity growth in the service sector in recent years is clearly a serious problem. However, it should be borne in mind that it is more difficult to measure productivity growth in this sector than it is in say manufacturing. For example, even though the use of ICT applications in services has increased, this has not shown up as productivity growth in the productivity statistics. Typically, innovations in the service sector are introduced through acquired technology (ICT, organisational changes and human capital) rather than through direct R&D spending by service firms themselves. This also applies to public services, where productivity growth targets also have to take into account social and public policy objectives as well as the requirement to ensure an environment which is conducive to innovation and productivity growth.

The structure of the Maltese economy is changing fast, and in factor inputs there is an increasing shift in emphasis away from physical capital to human capital. COVID-19 will only accelerate this process, with the demand for labour for skilled and qualified personnel in the digital economy and other technical services likely to increase as the

transition towards a more resilient and sustainable economy gathers pace and relying less than pre-COVID-19 days on sectors such as tourism, given the fragility of this sector to exogenous shocks. This change would bring about changes in the content of jobs themselves and not necessarily changes in the sectoral allocation of employment.

For instance, one could envisage a situation where the construction and property industry would invest heavily in digitalisation to bring it up to the best international standards. Whilst digital technology is transforming everything from hospitality and banking, to healthcare and e-commerce, Malta's construction industry has been slow to adopt this change. One cannot overlook the importance of a technology partner in enabling training and up-skilling of construction workers, but it seems culture is a significant barrier to embracing this necessary change.

There needs to be a willingness to embrace the digital future in this industry, and the digital transformation plays a key role within the construction industry to make it more sustainable and environmentally friendly. New technologies such as Artificial Intelligence (AI) can be applied to the construction industry. On top of AI, the construction industry could look at a range of technologies that could help them in the future, with virtual reality, cloud computing, software defined networking, block chain and Internet of Things, all possible for the future development of a sector that has been resilient to COVID-19 economic shocks.

***Recommendation A.1: There needs to be a willingness to embrace the digital future in industries that have proved to be more resilient to economic shocks (such as construction).***

Job creation in fast-growing, knowledge-intensive sectors is the future of our labour market, and individual productivity growth is more likely to occur if jobs are more secure and that workers have better opportunities to progress in their work and achieve higher earnings. This improves workers' qualifications and enhances their employability in a changing environment.

For businesses, boosting their productivity is crucial, and is a key to their competitiveness. As world markets determine prices to a large extent, and productivity cannot be increased indefinitely by traditional investment in machinery and equipment, other means must be used. For businesses productivity growth means that costs rise



more slowly, price competitiveness and payroll capacity improve, jobs are more secure (and hence more desirable), work tasks and organisation change, more added value is achieved for customers with fewer resources, profitability improves, growth and survival in the market become possible, and the ground is laid for investment and the development of activities.

In a fast-changing environment this can only be achieved if business embrace new technologies and operate in a digital economy. The role of Government in developing supportive policies is critical and the digital economy can help achieve a more sustainable, more productive Maltese economy which is the key objective of Government's economic policies as laid out in the Pre-Budget Document of the Ministry for Finance and Financial services.

The socio-economic benefits of enhanced investment in the digital economy cannot be downplayed in any way, but Government cannot do all this investment alone. Contributions from the private sector are critical. Private sector investment in digital infrastructure is not new. Infrastructure investments have been private sector led in most parts of the world for more than a generation. However, the scale of the investment required means that Government has to also attract investment from overseas in order to accelerate investment in our digital economy. Foreign direct investment already accounts for a sizeable proportion of investment in our economy. Investment in digital infrastructure needs to increase further and consistently in the coming months and years. Indeed, Investment in digital infrastructure is the tide that raises all boats.

The digital economy offers huge advantages in terms of administrative efficiency, resilience and ubiquity of access for all citizens, but this will not happen automatically. Government is already doing its part to support local digital applications, help develop content services and promote digital skills across the population as a whole but it needs to do more by developing measures and creating the optimal conditions to attract a sustainable flow of private investment in the digital economy that would help boost the transition towards a more sustainable, more resilient and more productive economy.

Malta's economic growth has depended particularly on the growth of the labour force. This model may have run its course because of COVID-19. Labour supply is no longer increasing at the same levels as pre-COVID-19. Business may be less willing than



before to invest in physical capital and instead focus more on human capital which is becoming more and more important. Businesses' own capital is increasingly being replaced by subcontracting. Gradually but surely, our economy needs to continue to shift away from manual work to (knowledge) work. Investment in basic training alone no longer brings as large productivity gains as before. Intangible success factors have entered the picture alongside tangible ones.

In addition to the above-mentioned growth factors, there is a need to create new growth-generating elements. Firstly, businesses' productivity growth must be increased from present levels. This calls for policies geared to creating an environment promoting sustainable business growth and innovation and to ensuring healthy competition. This is the only way to increase the overall size of the economic cake. Also, the world of work needs to be made more attractive.

Quality in 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 applies also to the green economy where new jobs are expected to be created, and possibly in sufficient numbers to offset job losses in sectors that may be phased out because of the transition required as part of the Green Deal. New jobs will be created by adopting sustainable practices in the energy sector, including changes in the energy mix, promoting the use of electric vehicles and improving the energy efficiency of buildings. However, Government will have to enact new and supportive policies for businesses to remain competitive and facilitate the transition.

***Recommendation A.2: 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.***

European-level programmes give consideration, in one way or another, to the development of working life and the possibility of workplaces to cope with challenges to change. Unfortunately, they usually offer only separate proposals, rather than a central starting point for guiding action. Moreover, coordination between programmes is not always as it should be, so that any progress, or lack of it, in the area of sustainable productivity goes undetected.

A key question is how businesses' productivity growth can be boosted in a way which supports workers' individual and collective resources whilst at the same time helping them to maintain their working ability and stay motivated to work in the face of changing conditions. When analysing productivity and employment, it is important to distinguish between the short-term and long-term impact. In the short term there is a negative correlation between productivity growth and employment.

Industrial restructuring seems to increase average labour productivity growth whilst lowering the employment rate. In these circumstances, Malta's labour market policy needs to be reviewed to improve workers' skills. At the same time, stricter protection of employment conditions in the private sector is deemed necessary so that the skills and knowledge of as many workers as possible can be harnessed effectively.

***Recommendation A.3: Stricter protection of employment conditions in the private sector is deemed necessary so that the skills and knowledge of as many workers as possible can be harnessed effectively.***

In the long-term labour productivity increases and raises the employment rate. In particular, the combined impact of technology and certain work quality components generate growth, which increases jobs and raises the employment rate. This does not happen automatically, however; rather it depends on the ability of industry to increase the labour intensity of growth and to boost long-term productivity growth, which is linked to both quality in work and job satisfaction.

COVID-19 has inevitably pressured businesses to assess competitiveness in the short term on the basis of monthly earnings and costs. There is a danger in the workplace that no productive investment will be made for some time and less or no attention be paid to staff skills or work ability. Moreover, pay and employment conditions are being set in accordance with minimum requirements, and this could have serious, long-term social consequences. This kind of approach poses a danger to Malta's competitiveness. Malta cannot compete through a combination of low-productivity work, inferior working conditions and low pay.

In spite of COVID-19, productivity can be increased in small steps through rationalising and streamlining techniques and developing products and services through the application of more intelligent production methods. This is not enough, however, if

workers are not motivated to work or there are shortcomings in the working environment which impair work performance.

***Recommendation A.4: In spite of COVID-19, and assuming workers are motivated, productivity can be increased in small steps through rationalising and streamlining techniques and developing products and services through application of more intelligent production methods.***

In a post COVID-19 scenario, maintaining economic growth will require deeper, structural reforms. Productivity can be increased quickly through a jump-like strategic change where businesses completely reorganise the way they are run and in so doing shift on to a new growth path. In that case jobs requiring old skills inevitably disappear, but at that same time new jobs are created, which are often better in terms of quality. Firms which renew themselves create new services and new value chains. Key factors in this process are speed, innovativeness, ability to change and involvement of staff in the process.

It is interesting to examine productivity as an aspect of business performance. Performance can be divided into internal and external aspects. External performance measures the company's ability to perform in the surrounding environment. However, productivity is most clearly seen as an internal characteristic of a company, and even one which is associated with an individual, machine or production cell.

The internal aspects of company performance are innovation and productivity, the prerequisites for which are skills and know-how, staff satisfaction and technology. From these follow quality and cost-effectiveness. The external aspects are competitiveness, customer satisfaction and market share, from which follow liquidity, profitability and solvency. The various aspects of performance affect each other in a spiral-like manner. Productivity growth leads to lower unit costs, as a result of which business competitiveness improves. However, productivity growth can only come about if businesses are prepared to invest, especially in human capital. Hence the term 'sustainable productivity' which means more than simply measuring productivity or only analysing labour productivity. Sustainable productivity covers not only the physical working environment but also the psycho-social working environment, from which spring efficiency, creativity and innovativeness.

The innovativeness of a business and its staff is reflected in the ability to develop and renew product or service concepts so that they create added value for customers. Innovativeness is also the ability to continually improve operational, production and distribution processes together with staff and partners. Thus, an innovation can be a tool, a piece of equipment, a machine, a combination of these, a service model, a new way of performing an old task, or a different solution to problems. The ability to change is a key element of productivity.

Increasing sustainable productivity therefore means that businesses prepare for future risks by anticipating changes and adapting quickly and flexibly to these changes. In these businesses everyone is committed to the ongoing development of skills and know-how, the well-being of staff is taken care of and employees take an active part in decision-making, especially decisions that affect the work they do. Workers are ready and committed to make their own input and make their skills available to further the success of the company.

***Recommendation A.5: 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.***

A key question in a post COVID-19 scenario insofar as boosting productivity growth is concerned is the ability of businesses to devise and deploy technologies and the business, organisational and other social innovations in working life which complement them. Productivity growth achieved in this way is sustainable. It influences economic growth via two channels; by improving the long-term productivity of workplaces or companies and by boosting labour supply, as employees' opportunities and desire to stay longer in work increase.

The aftermath of COVID-19 is likely to accelerate the process of change in job content, competencies and skills workers will require. Moreover, new ways of organising work and more effective application of technology will reduce the amount of labour needed. There is therefore a need to examine more closely what skills and knowledge will be required in working life in the future, both in private and public sector jobs, and also how quality of working life and productivity aspects could be incorporated into education and training. Degree and qualification structures, curricula content and teaching methods, and lifelong learning goals should be planned and implemented on

this basis. It is important to guarantee the financial opportunity to participate in education and training.

In addition to basic skills, key skills in the workplace of tomorrow will be e.g. interactive skills, self-management, the ability to learn and acquire new knowledge, extracting the essential from a complex flood of information, and the skills needed to work in multi-cultural workplaces and networks. In business management, the skill gaps are found particularly in the areas of strategic business skills and innovation management. Human resource management should be seen as a strategic aspect of management. These skills could act as a new kind of stimulus to economic growth, following COVID-19.

In fact, skilling and re-skilling must start from now and not following the expected end of the wage subsidy scheme that is being applied during COVID-19 and the job losses that are also expected. However, if the individual concerned do not have the money to invest in education, it will be a problem. It is therefore recommended that the Government should incentivise such persons using the wage subsidy scheme to encourage reskilling the workforce. The Government may opt to further incentivise reskilling training or specialised education in areas of great need such as healthcare, education and enforcement specialists in various sectors such as construction and financial services among others.

***Recommendation A.6: Skilling and re-skilling through support and incentives must start from now and not following the expected end of the wage subsidy scheme that is being applied during COVID-19.***

Malta's future economic growth demands within a number of sectors require that tomorrow's workforce have a high level of 'fit for purpose' competencies and skills relevant to the dynamic businesses of the future. One particularly essential requirement in preparing future workers is for the curriculum to equip all students with basic ICT skills, as well as solid literacy, numeracy, and problem-solving skills to enable students to use ICT effectively. Further active participation of industry and business in education particularly in revising programmes and curricula to the needs of the industry is critical to boost economic recovery post COVID-19.

One issue that needs to be addressed is the lack of flexible pathways between vocational education/training streams (VET) and non-VET streams. This is hindering human capital potential and causing skills mismatches in the labour market. The further development of VET pathways as an alternative to academic based studies is vital. Such pathways provide the opportunity for students to develop their potential, and hence the possibility to continue to study to achieve higher value skills and competencies, to the maximum of their ability.

***Recommendation A.7: More flexible pathways between vocational education or training streams (VET) and non-VET streams are needed.***

The education system must also be aligned with the jobs and careers of the future. Education and training must establish stronger links with Malta's labour market given that intelligence in labour supply and demand dynamics are critical in ensuring outcomes that address the needs of current and future labour markets. Related to this is the setting up of research hubs underpinned by researchers with postdoctoral fellowships. This should be seen as a priority for Malta to build indigenous research communities based on past and on-going human capital investment through Government scholarship programmes in doctoral studies.

***Recommendation A.8: Education and training must establish stronger links with Malta's labour market. This can also be done through building indigenous research communities with links to businesses.***

Businesses, trade unions and Government should invest more in incentivising low-wage workers to participate in training, which is a springboard for them to upgrade their skills, boost productivity and improve working conditions. A new generation of workers should be instilled with attributes such as work ethic, flexibility, ingenuity, discipline, continuous development, etc. – attributes which have been eroded over the years.

Again, in order to boost economic recovery, Malta should seek to embrace foreign talent and not fear it - importing talented and skilled EU and non-EU workers is a must. Government should revisit its current immigration and residency policy wherein it should adopt a selective immigration and residency policy directed to target persons who have the appropriate skills levels that the local economy is not in a position to provide in order to support sustainable economic growth.

Finally, a more effective contribution by irregular immigrants wherein they are encouraged to take up legal employment which will allow them to contribute to their well-being and to productively contribute Malta's economy.

***Recommendation A.9: Whilst embracing foreign talent, businesses, trade unions and Government should invest more in incentivising low-wage workers to participate in training, which is a springboard for them to upgrade their skills, boost productivity and improve working conditions.***

## **5.2 The Digital Economy and Innovation**

The application of ICT can empower the economy and society, directly and indirectly. As noted by the Malta Digital Strategy 2014-2020, it is both critical infrastructure and an enabling tool which has the potential to increase economic and social prosperity across most sectors and spheres of society. An enhanced drive for a digitalized economy can have significant effects on the overall levels of productivity and efficiency of an economy as well as play a key role to ensure a sustainable economic growth model in the years to come. The process of digitalization will also play an important role within the context of the attainment of Sustainable Development Goals associated with the delivery of public services. Within the context of the public sector, the shift towards enhanced digital processes will lead to a reduction in the cost of the provision of public services as well as provide a more personalized and faster service.

The process of digitalization is also significantly transforming the way businesses operate by encouraging them to take advantage of the opportunities within the European Digital Single Market and expand to bigger markets. It is also providing more flexibility to work, as we have witnessed this especially during the COVID-19 pandemic, where some companies even increased productivity through their employees working from home.

In the recent years the Maltese economy has indeed experienced various positive developments within this sphere. As discussed in section 3.2.2.1 in terms of investment in ICT infrastructure Malta ranks 25<sup>th</sup> from a total of 141 countries with regards to the overall ICT infrastructure quality. Such that with a score of 75, Malta exceeds the EA-19 and EU-27 average scores which amount to 72. These developments have also been acknowledged by the ICT Development Index, whereby Malta ranks 32nd from a

total of 173 countries. Malta also exceeds the EU average and stands with the top 10 within the EU-27 countries with regards to the Digital Economy and Society Index for 2019. Malta performed above the EU average in all the five dimensions of this index; connectivity, human capital, use of internet, integration of digital technology and digital public services. Malta is also considered as one of the front-runners in the EU's latest eGovernment benchmark of 2019, which measures countries' performance in user-centricity, transparency, cross-border mobility and key enablers.

There are various factors and policies which have been implemented in the recent years, that together have contributed to the attainment of these positive developments. The work undertaken by a number of governmental institutions and organizations most notably, the Malta Information Technology Agency (MITA), the Malta Communications Authority (MCA) and, in the recent years, the Malta Digital Innovation Authority (MDIA), the E-skills Malta foundation and Tech.mt have all, to varying degrees, played an important role in the attainment of the positive developments within this sphere. They have placed a robust foundation for various ICT related sectors in the economy to develop further and for many other sectors to enhance their drive towards digitalization. Another factor which should be acknowledged is the development of the comprehensive National Digital Strategy 2014 – 2020 which was published by the parliamentary secretariat for competitiveness and economic growth in March 2014. This strategy had identified three main pillars for the digital economy: Digital Government, Digital Citizen and Digital Business which had put forward 71 action points that required implementation over this time period. It should be noted that the parliamentary secretariat for financial services and digital economy, in consultation with Malta's first Digital Economy Think Tank, is expected, in the not too distant future, to publish an updated National Digital Strategy.

The digital sphere has expanded significantly over the recent years and there are now adequate foundations in place, which, if fostered appropriately, could allow the area to grow in a sustainable manner. The same, unfortunately, cannot be said about progress sustained in relation to the sphere of innovation and research which in the case of Malta does lack in several areas compared to the EU average. As discussed in Section 3.6, the Global Competitiveness Index innovation indicators ranks Malta 37<sup>th</sup> from 140 countries with a score of 50, lower than the EU-27 (59) and EA-19 (61). Malta lacks behind with respect to several key indicators for innovation, which remain below EU averages mostly in relation to the areas of cluster development, international co-



inventions, collaborations with multi-stakeholders, scientific publication, patent applications, investment in R&D, prominence of research institutions, and buyer sophistication. From the European Innovation Scorecard, it may be noted that Malta ranks 16<sup>th</sup> among the EU-27 countries thus further highlighting the fact that a greater effort is required by both the public and private sector within this area. Furthermore, a peer review by the European Commission on the Maltese Research and Innovation system, published in June 2019, asserts that if Malta is to continue its current economic success into the future knowledge-based economy, then both the public and private sectors need to invest significantly more in research, development and innovation.

The remainder of this section puts forward a number of recommendations aimed at fostering further growth and development within the digital economy (and indeed the Maltese economy as a whole) as well as number of recommendations aimed at addressing some of the key challenges relating to the area of innovation and research.

#### ***5.2.1 Diversifying the Maltese Economy by harnessing the full potential of emerging technologies***

As was highlighted in Chapter 1 of this Report over the recent years the Maltese economy has experienced a buoyant period of economic growth. A key driver which has underpinned such positive developments pertains to the expansion of a number of export-oriented service sectors, mostly notably the, gaming and financial service sectors, as well as the tourism sector, such that, at present, these three sectors together directly account for around a quarter of the total GVA generated in the Maltese Economy. Given the high dependence of the Maltese economy on these three sectors, economic sectoral diversification should be viewed as a priority for the Maltese economy moving forward. This point is further highlighted by the fact that a number of economic observers have argued that in terms of their sectoral development, both the gaming sector and the financial services sector, are now moving towards a point of maturity and it is unlikely that these sectors will expand at the same pace as that experienced the recent years. Furthermore, given the high element of uncertainty pertaining to the long-term implications of the COVID-19 pandemic on the global tourism industry, this sector may have to overcome a number of medium to long term challenges given the eventuality of lasting changes to the pattern of global tourism expenditure. It is within this context that an effective digital strategy for the Maltese

economy aimed at harnessing the full potential of emerging technologies may enable the creation of new economic activities which would aid in the process of economic diversification.

The Malta Digital Strategy 2014-2020, and the work undertaken by various private sector and public sector entities and organizations, has been crucial over the recent years to lay the appropriate foundations for new tech related activities such as blockchain, artificial intelligence and digital games to flourish. Looking ahead, it is of importance that a forthcoming digital strategy embraces and fosters recent advances in blockchain and Distributed Ledger Technologies (DLTs), artificial intelligence and digital games, big data and quantum computing, the internet of things, cyber security, and the application of Industry 4.0. An implementation of such a strategy would further increase the standing and reputation of Malta as a centre of excellence in digital and technological innovation which would be beneficial in order to attract the talent required to allow these sectors/activities to expand to their full potential as well as increase the overall competitiveness and resilience of the country.

***Recommendation B.1: A forthcoming digital strategy for the Maltese economy should further embrace and foster the recent technological developments in blockchain and distributed ledger technologies, artificial intelligence and digital games, the internet of things, big data and quantum computing, cyber security and the application of Industry 4.0, in order to further increase the standing and reputation of Malta as a centre of excellence in digital and technological innovation.***

#### **5.2.2 Expanding the labour supply within tech related knowledge intensive service sectors**

The expansion over the recent years of a number of export-oriented knowledge intensive service sectors, chief amongst which the gaming sector and the financial services sector, together with the subsequent expansion of the number of high-tech knowledge intensive firms which provide ancillary services to these two sectors has led to a significant labour market tightening within this economic sphere. As discussed in Chapter 1 the number of foreign workers within these sectors has increased significantly over the recent decade, such that at present various stakeholders within

these industries have asserted that it has become a challenge to fill in tech and ICT related vacancies, especially by Maltese and intra-EU citizens. Although there are a number of initiatives in place aimed at attracting foreign talent, such as the Higher Qualified Persons scheme, more needs to be done. If this issue is not addressed, it could damage the productivity of a number of KIS sectors and result in increasing overall employment costs which would in the long run implicitly cause a fall in the overall competitiveness. In order for the Maltese digital economy to expand successfully in the years to come, it must invest in attracting and maintaining top talented researchers and innovators to the island that will, in turn, build the necessary creative ecosystem and creative culture that will attract further talent to the country.

In order to address this gap in the labour market, a potential avenue, at least in the short-term, could be the introduction of Tech Visa, a fast track residence permit scheme for non-EU employees, start-up employees, founder and investors operating within the tech KIS sectors similar to those currently implemented in France and in Portugal. Such schemes aim to significantly reduced the time frame and, in some cases reduce the necessary requirements required to apply and process a residency application. Such a scheme would therefore increase the attractiveness for non- EU citizens to apply for a job in Malta as well as ensure that once a suitable candidate to fill a vacancy is identified by the employer, the placement can be processed at a fast pace.

***Recommendation B.2: Introduce a Tech Visa which acts as a fast track residence permit scheme for non-EU employees, start-up employees, founders and investors operating within the tech related knowledge intensive sectors.***

### **5.2.3 Upskilling the current ICT and tech related sectors**

The Malta ICT Skills Audit 2017, which was an audit carried out in collaboration between eSkills Malta Foundation and FastTrack into Information Technology (FIT) Ltd, put forward an ICT skills demand and supply monitor. This exercise was undertaken to put forward an in-depth analysis regarding the provision of education and training providers within the context of meeting the current and future skills developments of the Maltese economy. The report highlights that there is a need for

many more ICT practitioners, and professionals, than are currently being churned out by education providers, and that there is still a mismatch, and a gap, between the education and the industry requirements in the area of ICT related skills and competences. Findings from this report indicate that the ICT skills shortage is not a constant but escalating, with 67% of the demand for entry and competent level skillsets and only 31% requiring expert competencies. A key finding of the report is that the demand could be addressed through defined technology skills development programmes, ranging from 6 months to 24 months' duration, from level 3 upwards on the Malta Qualifications Framework (MQF). Furthermore 53% of respondents who participated within the audit exercise intimated that a clear, well defined, continuum of provision embracing both Further Education and Training and Higher Education would be beneficial. A key recommendation of the report asserts that further thought should be given to increasing the type and range of tech training provision, including enhancements in the areas of dual-education initiatives (learn and earn options), work-based learning and work experience/traineeship initiatives as a complement to current provision in addressing the application of skills and competencies in the tech and related sectors. A broader and more varied portfolio of provision would ensure greater complementarity and relevance between skills training, employment opportunities, and would encourage greater diversity in the Maltese tech skills arena to support future growth. Furthermore, in addition to a national certification, industry-based training and certification (IBTC) should be acknowledged as a valued component within the tech training ecosystem, which is held in high regard by many employers and will also aid to enhance professionalism in the ICT sector.

***Recommendation B.3: Increasing the type and range of tech training provision to bridge existing skill gaps identified across the various dimensions of the of the European e-Competence Framework (e-CF) and promote an industry certification framework to complement national awards in the form of 'blended' certification.***

#### **5.2.4 Bridging the national digital skills gap**

The expansion of the digital economy, which is ultimately composed of Industry, government and society, is intrinsically dependent on having the right supply of digital skills needed to be able to support the expansion of the digital economy within the challenging context of an ever-changing technological landscape. As noted in the National eskills Strategy 2019-2012, published in 2019, there is a substantial gap in the number of ICT practitioners available and the actual number required by each country. Furthermore, basic digital skills are also lacking in several EU countries such that, 44% of European citizens and 37% of people in the labour force do not have basic digital skills. Indeed, most EU countries are facing an uphill struggle in trying to bridge the gap between the digital skills required by the industry and the training and education available. As noted in Chapter 3 the DESI report for 2019 ICT skills in Malta are beyond the EU-28 average, but there are various challenges associated with ICT and digital skills across the general Maltese population. Indeed, Malta tends to rely on foreign workers to address the digital skills gap as evidenced by the eskills Malta foundation report which finds that 50% of Malta's job opportunities in tech-related sectors rely on the skills of foreign workers (eSkillsMalta, 2017). Bridging these digital skill gaps will not only increase productivity of the labour force and the efficiency of the public sector, but in the long run it would increase the job mobility and possibly also support the necessary labour supply requirements of knowledge intensive sectors operating in Malta. A medium to long term solution to address the challenge of the gap in basic digital skills is to undertake further effort to integrate and push forward digital literacy throughout secondary and possibly even primary school in such a way as to highlight further the importance of computational thinking and coding skills in order to intrigue and engage with students, as well as attract them to the digital sphere.

***Recommendation B.4: Identify basic digital skill gaps currently present across industry, government and society and upgrade the digital skills of the Maltese workforce in order to address the current and possible future tech skills deficits.***

### **5.2.5 Further supporting SMEs in the process of digitalization**

According to a CBM policy note (CBM, 2018) statistics indicate that as at 2017 there were only 113 firms in Malta that employed more than 250 persons. SMEs constituted 99.9% of all firms in Malta, with the vast majority, 97.3%, being micro firms employing less than 10 persons. Small firms, employing between 10 and 49 workers, accounted for 2.2% of all enterprises, while 0.5% of all firms were medium-sized. SMEs and in particular micro firms are thus at the very core of the Maltese business sector and as such they face specific challenges which should also be considered within the context of an assessment of the process of digitalization (and indeed the identification and respective tackling of specific digital skills gaps) within the Maltese Economy, especially for those enterprises which are not directly related to the ICT sector. Should Maltese SMEs want to thrive and be more competitive in the future, it is imperative to encourage a higher degree of digital transformation, digitalisation, fit-for-purpose digital skills and high-tech skills within existing organisations. To this end the Malta Digital Innovation Hub could play a very important role in supporting SMEs given that the primary role of a digital innovation hub is that to act as a one stop shop to help companies to become more competitive in their business/production processes, and products or services using digital technologies. They should be able to provide access to the latest knowledge, expertise and technology to support their customers with piloting and testing digital innovations.

***Recommendation B.5: Provide further support to SMEs to help them become more competitive in their business/production processes, and products or services using digital technologies.***

The challenges faced by many SMEs in Malta in the wake of the COVID-19 pandemic has further highlighted the need for many SMEs in Malta to invest in ICT facilities, as well as, invest in their e-commerce ecosystem, including digital marketing and their online payment systems. Such investments are generally very costly in relation to the size of most SMEs and may represent a sizeable expenditure not only to set up but also to maintain such systems. Increasing both the availability of grants and funds available to SMEs to undertake such investments, and possibly, also providing information and education on the various options available to them, and what skills are required from their end to adopt such systems, may be vital for SMEs in Malta to expand and thrive in the years to come both locally and within the EU single market.

***Recommendation B.6: Further support for SMEs in terms of access to finance in order to be able to invest in the process of digitalization as well as provide further support in terms explaining the possible costs and benefits of the various options available to them across the ecommerce ecosystem.***

#### **5.2.6 Increasing the size and scope of research, development and innovation initiatives across the Maltese Economy**

A stronger and more effective collaboration between academia, the public sector and the private sector is the only way forward to truly achieve a leap forward in terms of the medium and long-term goals for research, development and innovation (RDI). First and foremost, it is crucial that both the public and private sectors significantly increase their level of investment in RDI. Secondly, the University of Malta (UoM) and the Malta College of Arts, Science and Technology (MCAST) should develop a clear concept of cooperation and division of work in teaching, research and third mission. Together with the Government they should also develop an efficient system to support (and retain) scientifically talented individuals from school up to the highest university level, while attracting scientific talents worldwide.

***Recommendation B.7: The public sector should further recognize the strategic importance of research, development and innovation (RDI) and increase as well as intensify its expenditure in this area.***

***Recommendation B.8: Academia in Malta should develop a clear concept of cooperation and division of work in teaching, research and third mission and should develop an efficient system to support (and retain) scientifically talented individuals while also attracting scientific talents worldwide.***

The availability and access to research support funds is clearly also of paramount importance to the further development of RDI in Malta. To this end, it should be noted that the Malta Council for Science and Technology has been actively trying to establish schemes (e.g. the IPAS+ schemes) that do support research excellence. Such efforts should be intensified and further supported financially. More cooperation should also be achieved between Malta Enterprise (ME) and MCST in such a way as to ensure that instruments primarily delivering direct support to companies, possibly funded by the European Structural and Investment Funds (ESIF), should be concentrated with

ME, while instruments mainly aiming at public research should be coordinated and funded through MCST, with cross-agency referral in case of public-private collaboration.

***Recommendation B.9: Research support initiatives, such as the IPAS+ schemes, should be intensified and supported further.***

***Recommendation B.10: Enhance the cooperation between Malta Enterprise (ME) and MCST to ensure that both private and public sector entities, engaging in RDI, are readily assisted with support to tap into the right funding instruments.***

Another factor which could aid in further stimulating the level and quality of RDI in Malta is that of providing further support and incentives for start-ups. Start-ups can play a crucial role in driving innovation across its various dimensions, namely, product innovation, process innovation, organizational innovation as well as the exploitation of new markets. Unlike more mature companies or incumbents, which are more likely to invest in research and development on existing technologies and incremental innovation, start-ups are generally more focused on new technologies and cutting-edge innovation. Given their small size start-ups are generally more agile, and less bureaucratic, and are thus able to build an idea into a product and improve it upon consumer demand with faster decision-making communications. Successful start-ups can be key drivers for the creation of new markets or completely transform old markets via product innovation, and in the long run can play an important role as catalysts of competition and market disruption. Furthermore, a successful uptake of start-ups centred around a particular field or technology, such as, for example blockchain, can, over time lead to the formation of clusters which could attract further foreign direct investment, as well as foreign talent, to the Maltese economy.

Malta Enterprise, which is the national economic development agency responsible for promoting and facilitating international investment in the Maltese Islands, has over the recent years been very active in providing a number of incentives and packages to support innovation and start-ups. However, for the uptake of start-ups in Malta to be at a level which can have a notable impact on overall RDI, more assistance is required by enhancing the attractiveness of existing packages and incentive schemes created in order to facilitate and incentivize start-ups to setup in Malta. Further support and



assistance should also be provided to start-ups which perhaps are still in their very early stage of development. Failure to do so may in the long-term result in a significant lost opportunity for the Maltese economy, especially within the context of Malta's role as a driver of innovation within the digital sphere.

***Recommendation B.11: Enhancing the attractiveness of existing packages and incentive schemes in order to facilitate and incentivize start-ups to setup in Malta especially in relation to those start-ups that are perhaps still in their very early stage of development.***

### **5.3 Environment Recommendations**

The recommendations outlined in this section are based on the Green Deal Policy areas namely: biodiversity, sustainable agriculture, from farm to fork clean energy, sustainable industry, building and renovating, sustainable mobility, eliminating pollution, and climate action. These areas provide a holistic understanding of the green economy, a kind of economy which the EU in general is aspiring of achieving in the coming years. Structuring the proposals on the basis of the policy areas outlined in the EU Green Deal is important especially because the policy areas represent the future approach towards environmental matters across all Member States. Thus, policy and funding over the coming years will be designed on the basis of these areas. For each of the policy areas outlined below, a number of short, medium, and long-term recommendations are outlined.

A number of key policy experts contributed to the development of the policy proposals under each of these policy areas.

#### **5.3.1 Biodiversity**

Malta is a country relatively rich in biodiversity. This diversity of indigenous and endemic species and their habitats constitute Malta's natural capital. Such diversity is important as it maintains the functioning of a healthy natural environment and also provides us with multiple benefits in the form of life-supporting services, which are essential for our wellbeing and for the productivity of various economic sectors.

Although there are various ongoing efforts in support of biodiversity conservation, concern remains over the status of biodiversity and its loss. Direct drivers of biodiversity loss include pollution, overexploitation and land degradation. Indirect drivers of biodiversity loss are socio-cultural factors which result in the inefficient use of natural resources, such as unsustainable consumer choices.

Malta published two reports in 2007 and 2013, on implementation measures and conservation status assessment in line with Article 17 of the Habitats Directive. The assessments establish that the overall conservation status of both the habitats and species of community importance that are found in Malta improved towards a favourable status between these assessment periods

The National Biodiversity Strategy and Action Plan (NBSAP) 2012 – 2020 for Malta serves as a national policy driver to integrate biodiversity concerns into relevant sectoral or cross-sectoral plans, programmes and policies, especially those that can have a bearing on Malta's biological and natural resources. The document proposes:

- 19 national targets to be achieved by 2020;
- strategic directions seen as pre-requisites for reaching the targets; and
- a suite of 80 focused, action- and outcome-oriented measures grouped under the following 18 thematic areas.

While reflecting national priorities for biodiversity, these targets are also complementary to the 2020 global Aichi targets defined in the Strategic Plan for Biodiversity 2011-2020 under the framework of the UN Convention on Biological Diversity (CBD) as well as the targets defined in the EU Biodiversity Strategy to 2020. By doing so, Malta's NBSAP shall contribute towards the global efforts for halting and reversing the trend of loss of biodiversity.

As with many other environmental issues, resource constraints affect effective and timely conservation action and policy implementation to address threats to biodiversity. There is an increasing need to develop a strategy that addresses and monitors target species of EU community importance and national importance. Biodiversity-related legislation that allows the enforcement and court procedures against wildlife illegalities has increased but continued and strengthened coordination and cooperation between the relevant entities is still required. Furthermore, there is a need to increase awareness on the importance of biodiversity and participation to safeguard it.

***Recommendation C.1: There is an increasing need to develop a strategy that addresses and monitors target species of EU community importance and national importance. A new biodiversity strategy is thus required to chart the way forward in which the new plan will actively ensure that Malta reaches European standards and also contributes to enhancing the broader diversity of Europe including the marine spaces.***

### **5.3.2 From Farm to Fork and Sustainable Agriculture**

The Maltese agricultural sector is comprised of land farmers and livestock breeders. In contrast with most European counterparts, livestock breeders in Malta are mostly landless and breed their livestock indoors by supplementing them with imported feed concentrate and fodder, together with local fodder. Land farmers practice two forms of farming, namely; dry (arable) farming that relies on rain; and irrigated farmland in greenhouses and open fields. With the exception of the spring potato for export, most farmers engage in mixed farming practices and do not specialise on particular cash crops.

The agricultural sector represents less than 2% of the total Gross Value Added generated by the Maltese economy and accounted for less than 2% of all persons employed (NSO, Gross Domestic Product, 2014). These figures imply that the sector's contribution to the Maltese economy is low.

Nevertheless, agriculture plays a multifunctional role ranging from food production, food security on an island state, culinary tradition, land stewardship, environmental conservation, recreational landscape and a backdrop for the tourism industry, that go beyond the direct economic relevance.

Agriculture in the Maltese Islands is characterised by small-scale holdings and farms that are confronted with a range of physical and structural constraints that reduce the competitiveness of operators. A non-exhaustive list of such constraints include; scarcity of land related to the small size of the islands and dense population; lack of natural resources, in particular, water scarcity; urbanization, land use pressures and opportunity cost of land; dependence on imported fodder and other inputs that are

costly in view of a limited bargaining power; fragmentation of human and physical resources; and individualism and general inability to exploit economies of scale.

COVID-19 has shown the strategic importance of having food sovereignty and supply. It is also for this reason that sustainable agriculture needs to be high on the national agenda.

The Government has launched its National Agricultural Policy for the Maltese Islands 2018-2028. The Policy is intended to provide a clear direction and vision to all relevant stakeholders. This vision entailed the development of a policy that targets the following critical targets:

- A. Increasing the competitiveness of active farmers and livestock breeders by focusing on quality and embracing diversification;
- B. Facilitating the entry of young farmers by creating a cost-effective agri-business sector;
- C. Fostering sustainability of farming activities by adapting to the local geo-climatic conditions;
- D. Ensuring that farmland is managed by genuine farmers for agricultural purposes and related activities.

Following a wide consultation process, the Policy identified six strategic policy objectives which should be seen as being the cornerstone of this sector:

- food presentation, labelling and traceability;
- consolidation of land holdings;
- sustaining water and key resources;
- competitiveness and diversification;
- adaptation to and mitigation of geo-climatic conditions; and,
- research and development.

70 specific measures have been identified across all of the above objectives.

***Recommendation C.2: Given the holistic approach this Policy has taken and its broad scope, including the internalizing of the EU Green Deal and its Farm to Fork strategy; we believe that the timely implementation of this Policy***

***needs to be the sole focus of Government in this area. We believe that all the measures being recommended should be implemented and status reports should be issued on an annual basis to track their implementation.***

However, if we had to highlight a few of the most important recommendations we would say that the agricultural sector needs to:

***Recommendation C.3: Leverage the use of technology in agriculture to ensure that water use is optimised and to also set-up testing centres in Malta which will also allow Malta to establish itself as a food-tech regional hub especially with its location between Europe and Africa but also to support food tracing mechanisms. Meanwhile it is also important to enhance the skillset of the local farming community especially in new farming methods, organic farming, as well as on the use of pesticides to ensure that Malta's agricultural product becomes more premium.***

***Recommendation C.4: Following the success of the farmers market, this model should be replicated in other regions in Malta and also supporting should be given to farmers to access new markets including direct-to-consumer selling channels through technology to improve the value chain for farmers too.***

### **5.3.3 Clean energy**

Recent years proved to be a period of rapid enhancement of the energy sector in Malta. Government's energy policy focuses on providing Maltese citizens and businesses with affordable, sustainable and secure forms of energy; this is a reflection of the overarching policy fundamentals expressed by the EU Energy Union. The underlying objectives guiding Malta's energy policy decisions in the last decade include:

- Reducing Malta's dependence on the importation of oil through the achievement of a diversified energy mix;

- Reducing the carbon footprint and greenhouse gas emissions of Malta through improved efficiency in generation capacity, and through the replacement of heavy fuel oil with natural gas and renewable sources;
- Enhancing and strengthening the security of supply of the country whilst ensuring the availability of appropriate back up capacity;
- Stimulating investment in renewable energy sources through the provision of appropriate incentives;
- Achieving a degree of interconnection for electricity supply; and
- Overhauling the generation capacity of the country with a view to achieving higher efficiency gains whilst stimulating investment in natural gas infrastructures.

A number of these objectives have been successfully addressed. With Malta's Energy Policy published in 2012, a clear roadmap was delineated to ensure that Malta's energy sector meets these objectives. Priority was given to the swift upgrading of inefficient conventional electricity production infrastructure and the introduction of LNG as fuel for power generation. In addition, the electricity interconnector between Malta and Sicily was commissioned, studies started on a gas pipeline between Malta and Sicily and various schemes and investment grants have increased the generation capacity from renewable energy sources.

Malta's 2030 National Energy and Climate Plan was published in December 2019 and follows the scope of the Energy Union and covers its five dimensions: decarbonisation, energy efficiency, energy security, internal energy market, and research, innovation and competitiveness. The five dimensions are considered as being closely related and mutually reinforcing and are correspondingly treated as such within the plan.

Various recommendations and targets are put forward in the report which should add to Malta's gradual decrease in GHG Emissions. This is also highly linked to Malta's Waste Management Plan 2020-2030 and the construction of a waste-to-energy facility.

***Recommendation C.5: In terms of renewable energy, it is expected that further grants and incentives are given to increase the take-up of such technologies with a particular focus on solar. In terms of energy security, the gas pipeline is high on the agenda as studies continue to enable Malta to connect to the European gas market adding an added element to Malta's***

***energy security. Also, Government will be looking at the possibility of energy storage and improved demand management. Finally, investment in research & innovation will continue being promoted with a focus on public-private partnerships.***

#### **5.3.4 Sustainable industry**

Following the adoption of the Circular Economy Action Plan in 2015 and the setting up of a related stakeholder platform in 2017, the European Commission adopted a new package of deliverables in January 2018. This included additional initiatives such as a framework to monitor progress towards a circular economy.

The change to a more circular economy remains a challenge in Malta. According to the EU eco-innovation index, Malta remains in bottom group for eco-innovation performance (26th in the EU in 2016 from 18th in 2013). In addition, Malta's size and island status pose a number of unique challenges. The circular economy monitoring framework tracks key trends and patterns to understand how the various elements of the circular economy are developing and whether sufficient action has been taken. Circular (secondary) use of material in Malta was 5.2 % in 2016. This was below EU-28 average of 11.7% and decreasing when compared with previous years (10.2% in 2014). However, use rate for circular materials has increased since 2010, when there was a minimum of 4%.

Malta does not have a national Circular Economy strategy or roadmap; comprehensive action is needed to support circularity. The new Resource Recovery and Recycling Agency has been established to foster the transition towards a circular economy.

However, the sustainability of industry is broader than the circular economy. The proportion of Maltese SMEs that generate more than 50 % of their revenue from green products and services is significantly lower than in the EU average. Yet the share of companies that offer such products matches the EU level. Here, more support should be given for companies to start operating in the green economy and also address key issues such as circular economy.

As a result, the following recommendations are being recommended:

***Recommendation C.6: Malta should develop a circular economy strategy to set a clear path on how to achieve circularity in resource use. In order to promote this, a system of tax credits and incentives needs to be designed to target the nascent green economy. Other potential measures should involve focus on R&D and investment by companies that seek to address key challenges such as construction waste, and focus on demand-side incentives for people to be supported when purchasing such products.***

### **5.3.5 Green buildings**

Green buildings have become a key pillar of the EU Green Deal given that the construction industry is a key consumer of energy and resources. In Malta, green buildings are relatively new and there is no direct policy or strategy surrounding this but a number of sporadic and isolated initiatives have been taken in this regard.

The EU Green Deal is mainly going to target:

- Design of buildings should be in line with the circular economy;
- Prices of different energy sources should incentivise energy-efficient buildings;
- More climate-proofing of buildings; and,
- Strict enforcement of rules on energy performance of buildings.

In Malta, focus has been largely on energy efficiency. In Malta, through LN261/2008 the Energy Performance Certificate (EPC) was introduced. The EPC assesses and provides a numerical/alphabetical rating based on its current energy performance and carbon dioxide emissions. There is also an accompanying report that details ways in which to improve the energy efficiency of the property. EPC certificates became compulsory for all dwellings being sold or rented as from 02/01/2009 and as from 01/03/2018 there are new Maltese laws enforcing EPC certificates. For non-dwellings, EPCs are compulsory for buildings being sold, rented or if they have requested MEPA development permission to be newly constructed or undergo a change of use as from 01/06/2009.



The Nearly Zero Energy Buildings Plan (NZEB) plan for Malta, issued in August 2015, states that the proportion of energy consumed by buildings is the lowest in Europe, with consumption for households in 2013 generating 17% of total carbon emissions. This equates to around half of the EU28 average consumption. The NZEB Plan acknowledges that Malta has a limited range of renewables which may be of use. The most obvious, especially for buildings, is solar-based renewables (mostly photovoltaic and thermal). However, due to shading and limited access to roofs, this cannot be applied across the board. On the other hand, scarcity of land militates against communal photovoltaic farms. It was due to this scenario, that the definitions of NZEB have been developed with two components: a basic mandatory component which is mostly due to the building fabric and efficient building services; and a component of solar-based RES to be applied whenever possible.

To this end, it is being recommended that:

***Recommendation C.7: More incentives should be offered from the demand side for households and business owners to increase their investments in green buildings.***

***Recommendation C.8: Specific measures should be identified for green infrastructure including green roofs and green walls.***

***Recommendation C.9: Specific incentives including grants and feed-in tariffs should be introduced for energy efficient investments.***

### **5.3.5 Sustainable mobility**

Transport currently accounts for a quarter of the EU's greenhouse gas emissions and this figure continues to rise as demand grows. The European Green Deal seeks a 90% reduction in these emissions by 2050. Moving to more sustainable transport means putting users first and providing them with more affordable, accessible, healthier and cleaner alternatives.

A key objective is to boost considerably the uptake of clean vehicles and alternative fuels. By 2025, about 1 million public recharging and refuelling stations will be needed for the 13 million zero- and low-emission vehicles expected on European roads.

The Ministry for Transport and Infrastructure, together with Transport Malta, have come up with a comprehensive plan of action to put land transport in Malta on track to environmental sustainability while addressing a number of EU obligations that Malta must fulfil under the 2020 Climate Change and Energy Package.

By 2020, Malta is obliged to limit its greenhouse gas emissions increase to just 5% compared to 2005 recorded levels. By the same year, a share of 10% of all transport fuels consumed at national level has to come from renewable energy sources. Additional targets emanating from the Air Quality Framework Directive and the Environmental Noise Directive must be addressed.

The Malta National Electromobility Action Plan, launched in 2013, has put the achievement of the above-mentioned targets as its main goal. By implementing a gradual and phased policy for the electrification of transport (addressing both private and public mobility), and by building upon existing Plans and Measures, this Action Plan will contribute to reduce the negative transport environmental externalities for the benefit of all residents, especially those living in urban cores.

Malta has recently published its National Transport Strategy 2050 and Transport Master Plan 2025. Due to the size of the country and the level of urbanisation, this master plan has the form of a hybrid national transport plan and sustainable national urban mobility plan. It also sets the framework for regional or local mobility plans that are expected to be developed in the coming years. The Transport Master Plan prioritises active mobility, but also takes public transport, ferries and freight transport into account. Since Malta is a tourist destination, apart from resident commuters, it considers the mobility needs for infrequent users such as tourists. The Transport Master Plan is the first 10-year plan of an expected series of Transport Master Plans that will strive to achieve the goals established in the National Transport Strategy for 2050.

***Recommendation C.10: It is being proposed that the above plans and strategies particularly the ones emanating from the National Transport Strategy 2050 should be implemented.***

### 5.3.6 Eliminating pollution

The 'Zero Pollution Action Plan' that aims to be adopted by the commission in 2021 intends to achieve no pollution from "all sources", cleaning the air, water and soil by 2050. The Environment Quality standards are to be fully met, enforcing all industrial activities to be within toxic-free environments. Agricultural and urban industries water management policies will be overlooked to suit the "no harm" policy. Harmful resources such as micro-plastics and chemicals, such as pharmaceuticals, that are threatening the environment aim to be substituted in order to reach this goal.

In 2020, Malta launched its National Air Pollution Control Programme. The power generation sector remains one of the major contributors to atmospheric emissions in Malta. The shift in energy sources to natural gas and the deployment of the interconnector between Malta and Sicily have contributed to a decrease in emissions from power generation.

Although the Nitrogen Oxide emissions from power generation have decreased by over 90% between 2005 and 2017, emissions from the road transport sector have not reduced. While there are several sustainable measures that are being implemented in the road transport sector, this effort is masked by the daily increase in newly registered vehicles on the road. Several measures are mentioned in the Programme including free school transport, additional electrical buses, road infrastructure measures and improved ferry landing places.

This pillar also looks at waste management, Waste generation per capita in Malta remains high when compared to EU countries. However, over the past few years there was an improved waste intensity performance. Increased waste generation shows that we are still unable to uncouple waste generation from economic development. Resource productivity has also dropped with respect to previous years indicating that we have become more 'wasteful' of resources.

A new Waste Management Plan was developed to drive Malta in reaching its 2020 targets. More efforts on waste management are required over the next few years. These include solutions for residual waste management, whilst a landfill supporting other waste infrastructure is being pursued. A revised Waste Management Plan is

expected to be launched in 2020 and also earlier this year the Ecohive concept was launched which will house four waste-to-energy plants.

In terms of pollution; it is being recommended that:

***Recommendation C.11: Energy generation should be targeted towards cleaner fuels including hydrogen and natural gas. In line with this, renewable energy schemes and feed-in tariffs need to continue being promoted to increase their take-up.***

***Recommendation C.12: The move towards sustainable mobility especially through electrical vehicles and increased usage in public transport needs to be encouraged.***

***Recommendation C.13: Waste management, recovery and recycling need to be further prioritized to ensure that pollution from these sources is reduced.***

### **5.3.7 Climate change**

The EU is fighting climate change through ambitious policies at home and close cooperation with international partners. It is already on track to meet its greenhouse gas emissions reduction target for 2020 and has put in place the key laws and measures to achieve its climate and energy targets for 2030. By 2050, Europe aims to become the world's first climate-neutral continent.

Climate action is at the heart of the European Green Deal. First climate action initiatives under the Green Deal include:

- European Climate Law to enshrine the 2050 climate-neutrality objective into EU law
- European Climate Pact to engage citizens and all parts of society in climate action

Due to its geophysical, social and economic constraints, Malta is itself particularly vulnerable to the direct impacts of climate change. Any action that is taken today, on a

national and global level, to address climate change, will be reflected as reduced (economic and social) adaptation costs in the future.

For 2020, Malta's national target under the EU Effort Sharing Decision is to avoid increasing emissions by more than 5 % compared to 2005. For 2030, Malta's national target under the Effort Sharing Regulation will be to reduce emissions by 19% compared to 2005. Malta's national projections show that, with existing measures, the 2030 target may be missed by a margin of 46 percentage points. Malta is implementing a National Strategy for Policy and Abatement Measures Relating to the Reduction of Greenhouse Gas Emissions.

The Low Carbon Development Strategy is currently being formulated and this will have an outlook to 2050 and will replace all other policies and strategies. This is expected to be finalised at the end of 2020.

Malta published its National Energy Policy in 2012. This provides the measures to be implemented by 2020 and also a longer-term vision to 2030. The goal is to have 10% of energy produced from renewable sources by 2020.

***Recommendation C.14: Given that a lot of this priority depends on the Low Carbon Development Strategy, it is being recommended that this strategy is used as the main policy and strategy for this pillar.***

## 5.4 Recommendations by implementation Priority

This Section categorises the recommendations put forward in this document by implementation priority. **Tables 5.1, 5.2, and 5.3** present the ratings provided based on low, medium, and high priority in relation to the recommendations pertaining to the productivity in key areas of human capital, digital economy and innovation, and the green economy. 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 short-, medium-, and long-term challenges faced by the Maltese economy.

High priority recommendations are recommendations, which according to the authors, require immediate attention especially when taking into consideration the need to enhance productivity and economic resilience. Medium priority recommendations might not require immediate attention to the same degree as those identified as high priority, however, they are still deemed to be of significant importance to the overall productivity and competitiveness of the Maltese economy.

**Table 5.1 Human Capital**

Implementation priority and rating summary			
Recommendation	Low	Medium	High
<b>A.1:</b> There needs to be a willingness to embrace the digital future in industries that have proved to be more resilient to economic shocks (such as construction).			This will enhance efficiency and productivity in sectors which have proved to be more resilient during COVID-19. Hence it is worthwhile investing in such sectors. Innovation of business practices and the application of digital platforms is considered vital for businesses.
<b>A.2:</b> 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.			As above, this will enhance efficiency and productivity. Achieving this will not be easy especially if not allowed by collective agreements. However, COVID-19 has shown how vital flexibility in the workplace is especially in applying innovative business practices and digital applications.
<b>A.3:</b> Stricter protection of employment conditions in the private sector is deemed necessary so that the skills and knowledge of as many workers as possible can be harnessed effectively.			Though this recommendation may appear to contradict A.2, this is certainly not the case. Whereas flexibility is needed, employment conditions should be strengthened as this would support skills and knowledge transfer at the workplace.

<b>A.4:</b> In spite of COVID-19, and assuming workers are motivated, productivity can be increased in small steps through rationalising and streamlining techniques and developing products and services through application of more intelligent production methods.				The application of more sophisticated production methods will enhance the skills and knowledge content of jobs thus improving working conditions and value added.
<b>A.5:</b> 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.			Sustainable production processes will enhance efficiency and productivity. In addition, in an economy that aspires to be more sustainable, such processes make both financial and economic sense.	
<b>A.6:</b> Skilling and re-skilling through support and incentives must start from now and not following the expected end of the wage subsidy scheme that is being applied during COVID-19.				Businesses cannot wait for the pandemic to subside before reviewing business practices and supporting this by re-skilling of workforce. A number of business are doing this already, but many SMEs appear hesitant because of the uncertainty caused by COVID-19.
<b>A.7:</b> More flexible pathways between vocational education or training streams (VET) and non-VET streams are needed.				This is considered vital to allow for flexibility across education pathways and also to enhance the effectiveness of our education programmes.
<b>A.8:</b> Education and training must establish stronger links with Malta's labour market. This can also be done through building indigenous research communities with links to businesses.				A more strategic approach to enhance the interaction between education and training and the labour market is vital in a post COVID-19 scenario. Central to that link is research and innovation.



<p><b>A.9:</b> Whilst embracing foreign talent, businesses, trade unions and Government should invest more in incentivising low-wage workers to participate in training, which is a springboard for them to upgrade their skills, boost productivity and improve working conditions.</p>			<p>Enhancing the skills and productivity of low-waged workers requires a concerted effort on the part of employers and trade unions including sectors where trade union representation is limited. Ultimately improving working conditions of low-waged workers will further enhance productivity and not stifle it.</p>
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**Table 5.2 Digital Economy and Innovation**

Implementation priority and rating summary			
Recommendation	Low	Medium	High
<p><b>B.1:</b> A forthcoming digital strategy for the Maltese economy should further embrace and foster the recent technological developments in blockchain and distributed ledger technologies, artificial intelligence and digital games, the internet of things, big data and quantum computing, cyber security and the application of Industry 4.0, in order to further increase the standing and reputation of Malta as a centre of excellence in digital and technological innovation.</p>			<p>Given the economic stage of maturity attained by the gaming and the financial services sector in , as well as the high uncertainty and significant negative impact that the COVID-19 pandemic has had on the Tourism sector, an effective digital strategy for the Maltese economy, aimed at embracing the full potential of emerging digital technologies is key in order to spur on the further growth, increase economic competitiveness, and, crucially also increase Malta's economic resilience as a result of a higher level of economic diversification.</p>
<p><b>B.2:</b> Introduce a Tech Visa which acts as a fast track residence permit scheme for non-EU employees, start-up employees, founders and investors operating within the tech related knowledge intensive sectors.</p>			<p>In order for the Tech and ICT related sectors, including the gaming and finance sectors, to expand in the years to come the current labour supply and skills shortage in these areas needs to be addressed with urgency in order ensure that such sectors are in a position to develop to their full potential.</p>

<p><b>B.3:</b> Increasing the type and range of tech training provision to bridge existing skill gaps identified across the various dimensions of the of the European e-Competence Framework (e-CF) and promote an industry certification framework to complement national awards in the form of 'blended' certification.</p>	<p>Increasing the type and range of tech training provision as well as work experience/traineeship initiatives would create greater complementarity between skills training and employment opportunities, and would encourage greater diversity in the Maltese Tech skills areas in order to support future growth. This recommendation alone will not solve the short-term skills gap in this sector, but in the medium to longer term will help to promote further competitiveness and higher productivity within Tech and ICT related sectors.</p>		
<p><b>B.4:</b> Identify basic digital skill gaps currently present across industry, government and society and upgrade the digital skills of the Maltese workforce in order to address the current and possible future tech skills deficits.</p>		<p>In order to reap the benefits of new emerging technologies, as well as of developments in the digital ecosystem within the public sector, both of which would lead to higher efficiency and productivity, it is important to address Malta's current national digital skills gap. This recommendation is especially relevant in the eventuality of not being in a position to rely on foreign workers to help close the digital skills gaps.</p>	

<p><b>B.5:</b> Provide further support to SMEs to help them become more competitive in their business/production processes, and products or services using digital technologies.</p>			<p>In order for Maltese SMEs to thrive and gain competitiveness in the years ahead, especially following the impact that Covid-19 will have on the domestic and global marketplace, it is key to encourage and support a higher degree of digital transformation, digitalization, fit-for-purpose digital skills and high-tech skills within existing organizations.</p>
<p><b>B.6:</b> Further support for SMEs in terms of access to finance in order to be able to invest in the process of digitalization as well as provide further support in terms explaining the possible costs and benefits of the various options available to them across the ecommerce ecosystem.</p>			<p>The impact of the COVID-19 pandemic on the domestic and global marketplace has further highlighted the need for many SMEs in Malta to invest in ICT facilities, as well as, invest in their e-commerce ecosystem, including digital marketing and their online payment systems. Failure to do so may lead to a significant drop in their competitiveness and their ability to operate profitably, in both the short as well as the longer term, within their respective markets.</p>

<p><b>B.7:</b> The public sector should further recognize the strategic importance of research, development and innovation (RDI) and increase as well as intensify its expenditure in this area.</p>			<p>Given the low ratio of government spending as a percentage of GDP in R&amp;D in Malta, compared to the EU average, and a poor innovation ecosystem which lacks cluster development which promotes innovation (compared to the EU average) it is crucial that in the coming years the public sector, in conjunction with the private sector, undertakes a sizable increase in RDI investment. Whilst ensuring an effective absorption of funds related to R&amp;I based on an integrated approach among the different public bodies responsible for the implementation of RDI.</p>
<p><b>B.8:</b> Academia in Malta should develop a clear concept of cooperation and division of work in teaching, research and third mission and should develop an efficient system to support (and retain) scientifically talented individuals while also attracting scientific talents worldwide.</p>	<p>The long timeframe which would be involved for this recommendation to be implemented and the potential uncertainty surrounding the effective impact that this policy would have in terms of aiding to retain scientifically talented individuals and its effectiveness in terms of attracting scientific talents places this recommendation on the lower end of the spectrum in terms of prioritization.</p>		

<p><b>B.9:</b> Research support initiatives, such as the IPAS+ schemes, should be intensified and supported further.</p>			<p>The availability of research support funds is clearly also of paramount importance in order to spur on further investment in research and innovation. Such programmes also promote international research cooperation across institutions which is important for the RDI system given that there is significant room for further reinforcement of support towards the internationalization of RDI activities, including in the field of digital innovation.</p>
<p><b>B.10:</b> Enhance the cooperation between Malta Enterprise (ME) and MCST to ensure that both private and public sector entities, engaging in RDI, are readily assisted with support to tap into the right funding instruments.</p>			<p>In line the motivation for a high level of priority for recommendation B.9 it key to ensure that both private and public sector entities, engaging in RDI, are readily assisted with support to tap into the right funding instruments. Such a recommendation would entail enhanced efforts by funding agencies to radically simplify the funding scheme application and selection processes as well as undertake a systematic promotion of a more transparent and coordinated support for the nation's RDI ecosystem.</p>

<p><b>B.11:</b> Enhancing the attractiveness of existing packages and incentive schemes in order to facilitate and incentivize start-ups to setup in Malta especially in relation to those start-ups that are perhaps still in their very early stage of development.</p>		<p>Although there have been positive developments in terms of the incentives and packages to support start-ups, it is important to further develop the capacity of existing innovation hubs and promote the creation of new hubs as well as enhancing the attractiveness of existing packages and incentive schemes created in order to facilitate and incentivize start-ups. Priority should be given to this recommendation whilst acknowledging the degree of uncertainty pertaining to the factors that attract start-ups, and the likelihood that a particular start-up can be a springboard for further innovation.</p>	
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**Table 5.3 Green Economy**

Implementation priority and rating summary			
Recommendation	Low	Medium	High
<p><b>C.1:</b> There is an increasing need to develop a strategy that addresses and monitors target species of EU community importance and national importance. A new biodiversity strategy is thus required to chart the way forward in which the new plan will actively ensure that Malta reaches European standards and also contributes to enhancing the broader diversity of Europe including the marine spaces.</p>			<p>Being an island state, environmental issues are even more amplified. Our resource constraints highly influence the effectiveness and timely action and policy implementation to address threats to biodiversity.</p>
<p><b>C.2:</b> Given the holistic approach this Policy has taken and its broad scope, including the internalizing of the EU Green Deal and its Farm to Fork strategy; we believe that the timely implementation of this Policy needs to be the sole focus of Government in this area. We believe that all the measures being recommended should be implemented and status reports should be issued on an annual basis to track their implementation.</p>			<p>COVID-19 has shown the importance of food sovereignty and security. The decline in tourism also had significant impact on this primary industry. Going forward, also in light of the EU's significant investment in this area, agriculture should be seen as a sector ripe for reform.</p>



<p><b>C.3:</b> Leverage the use of technology in agriculture to ensure that water use is optimised and to also set-up testing centres in Malta which will also allow Malta to establish itself as a food-tech regional hub especially with its location between Europe and Africa but also to support food tracing mechanisms. Meanwhile it is also important to enhance the skillset of the local farming community especially in new farming methods, organic farming, as well as on the use of pesticides to ensure that Malta's agricultural product becomes more premium.</p>		<p>Malta has a unique opportunity to develop itself as a testing hub for innovative technologies especially due to the synergies with Government's drive to build a digital economy. This measure should be considered as an additional measure to Recommendation C.2.</p>		<p>Following the implication of COVID-19, further support should be allocated towards the integration of value and supply chain. This will support incomes of those dependent on the already volatile agricultural sector.</p>
<p><b>C.4:</b> Following the success of the farmers market, this model should be replicated in other regions in Malta and also supporting should be given to farmers to access new markets including direct-to-consumer selling channels through technology to improve the value chain for farmers too.</p>				

<p><b>C.5:</b> In terms of renewable energy, it is expected that further grants and incentives are given to increase the take-up of such technologies with a particular focus on solar. In terms of energy security, the gas pipeline is high on the agenda as studies continue to enable Malta to connect to the European gas market adding an added element to Malta's energy security. Also, Government will be looking at the possibility of energy storage and improved demand management. Finally, investment in research &amp; innovation will continue being promoted with a focus on public-private partnerships.</p>			<p>In view of Malta's emission targets and Government's commitment to sustainable development, Malta needs to further incentivise the take-up of renewable energy.</p>
<p><b>C.6:</b> Malta should develop a circular economy strategy to set a clear path on how to achieve circularity in resource use. In order to promote this, a system of tax credits and incentives needs to be designed to target the nascent green economy. Other potential measures should involve focus on R&amp;D and investment by companies that seek to address key challenges such as construction waste and focus on demand-side incentives for people to be supported when purchasing such products.</p>			<p>Government has already launched its Ecohive concept which will commence the journey towards a circular economy. Further investments in various sectors can be an important source of economic recovery.</p>

<p><b>C.7:</b> More incentives should be offered from the demand side for households and business owners to increase their investments in green buildings.</p>		<p>While incentives for green buildings are critical, they need to be seen within the overarching low carbon strategy as outlined in Recommendation C.14.</p>	
<p><b>C.8:</b> Specific measures should be identified for green infrastructure including green roofs and green walls.</p>			
<p><b>C.9:</b> Specific incentives including grants and feed-in tariffs should be introduced for energy efficient investments.</p>			<p>In view of Malta's emission targets and Government's commitment to sustainable development, Malta needs to further incentivise the take-up of renewable energy.</p>
<p><b>C.10:</b> It is being proposed that the above plans and strategies particularly the ones emanating from the National Transport Strategy 2050 should be implemented.</p>			<p>Transport remains a key challenge for Malta on a number of levels. The implementation of the Transport Strategy and Master Plan should be therefore considered top priority.</p>

<p><b>C.11:</b> Energy generation should be targeted towards cleaner fuels including hydrogen and natural gas. In line with this, renewable energy schemes and feed-in tariffs need to continue being promoted to increase their take-up.</p>		<p>There has been significant investment of the energy sector over the recent years. The path toward cleaner fuels remains important for Malta's competitiveness and sustainability. In view of the broad benefits accruing from these investments, this prioritisation should continue. Priority should always be given to renewable energy.</p>	
<p><b>C.12:</b> The move towards sustainable mobility especially through electrical vehicles and increased usage in public transport needs to be encouraged.</p>			<p>Transport remains a key challenge for Malta on a number of levels. Government has already launched a number of investments and incentive schemes to facilitate the take-up, these should be continued.</p>
<p><b>C.13:</b> Waste management, recovery and recycling need to be further prioritized to ensure that pollution from these sources is reduced.</p>			<p>Government has already embarked on a significant investment to modernise Malta's waste management facilities. As a small island that is densely populated, the effective management of waste is key for Malta's future sustainable growth.</p>
<p><b>C.14:</b> Given that a lot of this priority depends on the Low Carbon Development Strategy, it is being recommended that this strategy is used as the main policy and strategy for this pillar.</p>			<p>Government has already stated its intention to pursue a Near-Zero Carbon Strategy for Malta. Given its transversal nature, this policy should be given high priority.</p>

## 5.5 Update of the 2019 Recommendations

This section refers to the 2019 recommendations and provides an update, based on expert judgement. The criteria cover implementation priority, implementation progress, and consistency with the recommendations outlined in this chapter. The NPR 2019 recommendations are centred on the thematic areas of meso level productivity, human capital, research and innovation, and, infrastructure and the real estate market.

Implementation priority refers to the level of significance and urgency of implementation of each respective recommendation, taking into consideration the present and potential future context of the Maltese economy. Implementation progress within the context of this update refers to an evaluation in terms of policy implementation, or general progress, undertaken within the specific area of concern. The consistency with NPR 2020 recommendations highlights the level of complementarity that each of the 2019 recommendations has with respect to the recommendations outlined in Chapter 5 of this report. For each criterion, a scoring system is established. The scoring system, similar to that adopted in the NPR 2019, takes the form of a Likert scale ranging from 1 to 5.

Based on these criteria and scoring method, [Tables 5.4, 5.5, 5.6](#) and [5.7](#) put forward the 2019 recommendations. Each table provides a brief explanation for the associated rating with respect to each of three criteria.

**Table 5.4 Meso-level Productivity**

<i>Criteria</i>		Implementation Priority	Implementation Progress	Consistency with NPR 2020 Recommendations
Recommendation		Score 1-5	Score 1-5	Score 1-5
<p><b>2.1:</b> Support the creation of clusters that bring together enterprises from different sectors.</p>		<p>5</p> <p>Budget 2020 announced plans to set up clusters bringing together different businesses in industrial zones.</p>	<p>2</p> <p>Government has recently announced a 470 million euro eight-year investment to upgrade industrial estates. This will include Life Sciences Park and Kordin Incubation Centre. This is a step in the right direction and more progress will be expected in the coming months.</p>	<p>5</p> <p>This is consistent with the NRP 2020 Recommendation A4 in that the common goal is to support new and more productive economic sectors but also to make existing ones more efficient and productive.</p>
<p><b>2.2:</b> Set up educational programmes to address the demand for new skills in highly productive sectors.</p>		<p>5</p> <p>This is on-going with MCAST and the University of Malta being particularly responsive to developing new programmes reflecting demand for new skills.</p>	<p>3</p> <p>Malta's educational institutions have been particularly responsive to new developments including technological developments.</p>	<p>5</p> <p>There is consistency in that the development of new programmes, fully in line with industry/business requirements, is highlighted in the 2020 NRP Recommendations A6, A7 and A8.</p>

<p><b>2.3:</b> Intensify the efforts directed at strengthening the regulatory framework as well as anti-money laundering with respect to high productivity sectors exposed to international competition.</p>	<p>5</p> <p>This is hugely important as it will avoid destabilising key economic sectors.</p>	<p>5</p> <p>Significant progress has been made to address the regulatory framework and anti-money laundering.</p>	<p>5</p> <p>Although this recommendation has not been brought forward as a recommendation in this report it should be noted that its implementation is nonetheless fully endorsed.</p>
<p><b>2.4:</b> Support human capital creation and improvement in low productivity services sectors exposed to international competition.</p>	<p>5</p> <p>COVID-19 has disrupted plans to address low productivity in sectors impacted by the pandemic. However, it is vital that low productivity is addressed across sectors lagging behind. On a general level, investment in human capital is on-going.</p>	<p>3</p> <p>The results of investment in human capital are expected in the medium and long-term but it is necessary for this investment to be on-going.</p>	<p>5</p> <p>This is fully consistent with 2020 recommendations A6, A7 and A8 where again emphasis on human capital, as on the factors determining productivity, is highlighted.</p>

<p><b>2.5:</b> Low productivity sectors should benefit from interlinkages with other sectors with the aid of technology.</p>	<p><b>5</b></p> <p>This recommendation is crucial to enhance productivity in sectors which are lagging behind. Investment in technology to support low productivity sectors is required and more businesses are investing in digital platforms or are planning to do so. Of course, this has to be seen against the backdrop of closures.</p>	<p><b>2</b></p> <p>This investment is on-going but needs to be accelerated for businesses to remain competitive and to provide innovative products and services.</p>	<p><b>5</b></p> <p>This too is fully consistent with the 2020 recommendation A1 which highlight the relevance of technology and digital platforms to increase productivity.</p>
<p><b>2.6:</b> Publish a more disaggregated sectoral productivity data, including at firm level.</p>	<p><b>4</b></p> <p>This recommendation could support research and the identification of sectors/activities with different productivity levels and the reasons for such variability. However, the setup of a disaggregated sectoral productivity data is still some distance away.</p>	<p><b>1</b></p> <p>No progress on this recommendation as yet.</p>	<p><b>4</b></p> <p>The 2019 recommendation complements the 2020 recommendation A1 in that it supports initiatives aimed at increasing productivity.</p>



Table 5.5 Human Capital

Criteria		Implementation Priority Score 1-5	Implementation Progress Score 1-5	Consistency with NPR 2020 Recommendations Score 1-5
Recommendation		4	1	4
<p><b>3.1:</b> Intensify the efforts directed at reducing the Early School Leaving (ESL) rate.</p>	<p>This is an on-going effort on the part of the education authorities and COVID-19 has somewhat derailed efforts in the direction as suggested in 3.1. The problem remains largely as was in 2019.</p>		<p>Not much progress made but one would expect more emphasis in 2021 as the pandemic subsides.</p>	<p>Again, this is consistent with 2020 recommendations on human capital, A6, A7 and A8.</p>

<p><b>3.2:</b> Social inclusion of immigrants within the education system needs to be further encouraged.</p>	<p>4</p> <p>This too is an on-going effort. Not easy by any means and will take time before migrant children are fully integrated in our education system.</p>	<p>2</p> <p>Not much progress made but one would expect more emphasis in 2021 as the pandemic subsides.</p>	<p>2</p> <p>Although this recommendation has not been brought forward as a recommendation in this report it should be noted that its implementation is nonetheless fully endorsed.</p>
<p><b>3.3:</b> 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.</p>	<p>4</p> <p>Schemes already exist for young low achievers. The challenge here is to ensure that all those participating actually complete their apprenticeship or programme.</p>	<p>3</p> <p>This is on-going though schemes have not always proved as successful as anticipated. However, programmes such as Youth.inc aims to guide young people to develop in a holistic way. The programme is developed around a youth centred approach with the aim to engage young people in their own process of development and enable them to access further study, apprenticeships and employment.</p>	<p>4</p> <p>This is consistent with recommendations in 2020 A6, A7 and A8 where emphasis is also placed on enhancing skills for all workers especially low-skilled ones.</p>

<p>3.4: Efforts need to be sustained in terms of encouraging participation by low-skilled employees in adult learning.</p>	<p>Aimed at low-skilled workers, their participation in adult learning is a mixed experience. Measures as part of COVID-19 support programme helped facilitate training for workers impacted by partial lockdown measures earlier this year but more needs to be done to increase involvement of low skilled workers in adult learning particularly on digital applications.</p>	<p>Adult learning for low-skilled workers is on-going but not as effective and coverage is not extensive. More progress is required to increase effectiveness and coverage.</p>	<p>Consistent with 2020 recommendations A6, A7 and A8 where skills development related to economic sectors is considered crucial.</p>
<p>3.5: Adopt a holistic approach whereby the creation of skills is mainstreamed within each element of economic and social development policies in Malta.</p>	<p>To some extent this is already happening though a more strategic approach is deemed necessary to facilitate the mainstreaming as recommended in 3.5. That approach requires all education authorities working closely with business and employers' organisation as well as trade unions.</p>	<p>Whereas the Education Authorities are working closely with educational institutions particularly University and MCAST, the mainstreaming as suggested in 3.5 is at an early stage.</p>	<p>2020 recommendation A7 refers to more flexible pathways across educational institutions and hence there is consistency with 2019 recommendation.</p>

<p><b>3.6:</b> Ensure equal opportunities amongst priority categories of workers, including females (addressing the gender pay gap), older workers and workers with a disability.</p>	<p>3</p> <p>Some inroads in this area has been achieved but there are still some sectors where gender pay gap remains a problem.</p>	<p>2</p> <p>Trade unions have been particularly active to achieve gender pay gap and Government policies have supported this objective.</p>	<p>2</p> <p>Although this recommendation has not been brought forward as a recommendation in this report it should be noted that its implementation is nonetheless fully endorsed.</p>
<p><b>3.7:</b> Continue to sustain work-life balance to ensure longer working lives, which address not only the facilities but also the culture in the workforce.</p>	<p>3</p> <p>COVID-19 has impacted on our working lives and to so some degree also work-life balance. However, prior to COVID-19 some progress had been made.</p>	<p>2</p> <p>Trade unions have been particularly active in promoting work-life balance and Government policies have supported this objective.</p>	<p>2</p> <p>Although this recommendation has not been brought forward as a recommendation in this report it should be noted that its implementation is nonetheless fully endorsed.</p>

<p><b>3.8:</b> Ensure that Malta remains an attractive place to live and work to retain migrant workers as well as the local population.</p>	<p>4</p> <p>Living in Malta still has its attractions despite COVID-19. Rents have gone down though this depends on the type of property and location.</p>	<p>2</p> <p>In 2020 new rules governing the rental market, with particular emphasis on rental contracts were introduced. Subsequent to this but for reasons altogether different, rents have fallen by around 11 per cent between April to June 2020 according to the Central Bank. The Central Bank's analysis of the residential real estate rental market now rests on the use of 'Big Data' from publicly available sources, allowing it to get a better understanding of the evolution of private-sector rents.</p>	<p>2</p> <p>Although this recommendation has not been brought forward as a recommendation in this report it should be noted that its implementation is nonetheless fully endorsed.</p>
<p><b>3.9:</b> Social integration at the place of work is to be ensured.</p>	<p>3</p> <p>A lot more needs to be done to support social integration of migrant workers including educating them on work practices and regulations including on safety.</p>	<p>2</p> <p>Still an early stage though some policy initiatives have been taken.</p>	<p>2</p> <p>Although this recommendation has not been brought forward as a recommendation in this report it should be noted that its implementation is nonetheless fully endorsed.</p>

<p><b>3.10:</b> Make use of European Social Funds to tackle in-work poverty.</p>	<p>4</p> <p>This should be a priority in the new MFF allocation under ESF for the Maltese Islands. As things stand, funding to address this problem is insufficient.</p>	<p>2</p> <p>This is likely to be implemented with new EU MFF Budget allocation under ESF.</p>	<p>2</p> <p>Although this recommendation has not been brought forward as a recommendation in this report it should be noted that its implementation is nonetheless fully endorsed.</p>
<p><b>3.11:</b> Workplaces should consider introducing the concept of mentoring as well as a knowledge-transfer programme.</p>	<p>5</p> <p>A lot more needs to be done to introduce mentoring and knowledge transfer schemes at the workplace. The public sector and many organisations in the private sector do this effectively often supported by documentation but this is not always the case in many small businesses.</p>	<p>2</p> <p>Formal guidelines for mentoring at work is yet to be set up but as stated mentoring already exists in many organisations.</p>	<p>2</p> <p>Though there is no specific reference to this in 2020 recommendations, this is consistent with objective to invest more time and resources in human capital to enhance productivity.</p>

**Table 5.6 Research and Innovation**

<i>Criteria</i>			
		Implementation Priority (Score 1-5)	Implementation Progress (Score 1-5)
Recommendation		5	(Score 1-5)
<p><b>4.1:</b> Greater leadership role by Government in promoting R&amp;I through institutional reforms and closer co-ordination across R&amp;I policy making entities</p>	<p>This recommendation covers important aspects which need to be put in place for Malta's innovation ecosystem, which is underpinned by a lack of cluster development and limited collaborations that promote innovation, at least when compared to the EU average. It is important to ensure that the public sector aids in the effective absorption of funds related to R&amp;I and ensures that an integrated approach is employed among the different public bodies responsible for the implementation of RDI.</p>	<p>5</p>	<p>3</p> <p>Progress has been slow on this, however from the strategic perspective some progress is being made with the publication of the National Strategy for Research and Innovation in Energy and Water (Ministry for Energy and Water Management), as well as work currently being undertaken by MCST in relation to the forthcoming publication of to the Malta's Research and Innovation Smart Specialization Strategy (RIS3) 2021-2027.</p>
			<p>Consistency with NPR 2020 Recommendations (Score 1-5)</p> <p>5</p> <p>This recommendation is highly consistent with the NPR 2020 recommendations as it is in line with recommendations B.7 and B.10.</p>

<p>4.2: Greater funding access</p>	<p>Greater funding access of research support funds is clearly of paramount importance in order to spur on the further investment in Research and innovation. This measure would further encourage collaborative actions between social and civil actors, as the funding take-up opportunities are promoted and facilitated by this measure.</p> <p>Likewise, the improvements to funding mechanisms can encourage the exploration for cross-sectoral R&amp;I opportunities that can benefit from such funding as well as international research cooperation across institutions which is also important for the research and innovation system.</p>	<p>5</p>	<p>3</p> <p>There have been no notable developments in this area. The main funding channels, nonetheless, still persist, such as the provision of IPAS + research scheme and the continuation of the FUSION scheme undertaken by MCAST, and by the Research and Development Incentive Scheme by Malta Enterprise. Efforts need to be intensified in this area in order to stimulate further investment in RDI given Malta's very low overall expenditure in this area in relation to the EU average.</p>	<p>5</p> <p>This recommendation is highly consistent with the NPR 2020 recommendations as it is in line with recommendations B.7 and B.9.</p>
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4	4	4	5
<p>4.3: Further developing the capacity of existing innovation hubs, setting up sectoral innovation hubs, and connecting with European integrated hub network.</p>	<p>Innovation hubs are seen as an influential instrument for overcoming potential limitations associated to the development of R&amp;D within small-scale economies. The development of innovation hubs together with greater international, multilateral and bilateral collaboration will likely facilitate innovation in the local economy via the enhanced exposure to international knowledge and practices.</p>	<p>There has been a concerted effort to create and support the development of Innovation Hubs (centred around technological innovation) in Malta by policy makers targeted in the areas of ICT and Fintech. Examples of such developments as the consortium of entities which form the Malta Digital Innovation Hub (M-DIH) aimed at consolidating the existing ecosystem to enable businesses to access sector-specific, technological and financial expertise, the MITA Innovation Hub and the Gozo innovation hub. Notable developments have also been undertaken in relation to the development of two regulatory sandboxes, which in terms of the benefits to the process of innovation serve a similar function to an innovation hub, namely, the forthcoming MDIA technology driven ITA Sandbox and the MFSA FinTech Regulatory Sandbox</p>	<p>This recommendation is consistent with the NPR 2020 recommendation B.11 which proposes the expansion and development of innovation hubs as a means to further incentivize the up-take of start-ups.</p>

<p>4.4: Increased public investment in RDI, including through PPPs</p>	<p>5</p> <p>For the RDI ecosystem to expand at the necessary pace it is crucial that in the coming years the public sector, in conjunction with the private sector possibly through PPPs, increases its investment in R&amp;D. Indeed, the government cans play a central role in terms of facilitating innovation creation as well as for the diffusion of technological innovations. The recommendation should further be evaluated within the context of the low ratio of government spending as a percentage of GDP in R&amp;D that Malta has compared to the EU average.</p>	<p>2</p> <p>The research and development data published by the NSO for 2016-2018 (published in 2020), indicates that public sector expenditure on RDI as a percentage of GDP has remained relatively stable around the 0.6% mark, well below the 2% EU average. At the time of writing this report, that are no policy measures or public sector initiatives in place which suggest that this ratio is likely to increase by the magnitude necessary to approach the 2% mark.</p>	<p>5</p> <p>This recommendation is highly consistent with the NPR 2020 recommendations as it is in line with recommendation B.7</p>
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<p>4.5: Support for other non-R&amp;D forms of innovation</p>	<p>4</p> <p>In certain RDI areas, limited resources may hinder local enterprises to undertake the development of the full R&amp;D cycle. Under such constraints, firms may benefit from engaging in other forms of innovation with a focus on Product innovation, process innovation, organisational innovation and market innovation. Such non-R&amp;D intensive forms of innovation investments may also be viewed as significant inputs for overall generation of specific innovation outcomes and should be thus adequately supported. The benefits of such a measure and the associated benefits will be of benefit in the long term as it supports further economic diversification as possible clusters emerge as well as allows for the mobilization of firms which are not position to support the full RDI cycle, to utilize existing support measures.</p>	<p>3</p> <p>Progress on this has been relatively slow and focused predominately on the areas of technological innovation. The development of two regulatory sandboxes namely, the forthcoming MDIA technology driven ITA Sandbox and the MFSA FinTech Regulatory Sandbox should aid to attract start-ups which may be ideally placed to focus on a particular area of non-R&amp;D forms of innovation</p>	<p>3</p> <p>Although this recommendation has not been brought forward as a recommendation in this report it should be noted that its implementation is nonetheless fully endorsed.</p>
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<p>4.6: Strengthening R&amp;I academia-business linkages</p>	<p>5</p> <p>Tightening the link between academia and the business sector should be viewed as key policy in order to ensure that innovation activities and ultimately innovation investments effectively translate into the desired innovation outputs. Targeted efforts should be aimed at directing research to concentrate on the areas needed by the business sector as well as towards incentivizing enterprises (via the provision of the necessary resources and aid in mitigating risks) to venture into innovation opportunities itself identified from research. Efficiency would also be enhanced through increased knowledge transfer across and within academia and business.</p>	<p>3</p> <p>There have been no significant announced initiatives on this measure other than the ongoing FUSION programme which supports industry-academia collaborations is still ongoing. Furthermore, it should be noted that in the not too distant future MCST will be putting forward a new Research and Innovation Smart Specialisation Strategy for Malta (RIS3) 2021-2027 in which various aspects of this recommendation could be further addressed and supported through the next programming period of cohesion policy (ERDF 2021-2027).</p>	<p>4</p> <p>This recommendation integrates various aspects of two NPR 2020 recommendations, namely B.8 and B.10.</p>
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<p>4.7: Developing a comprehensive monitoring system which enables a more quantitative/ objective evaluation of innovation outputs and impacts, for example through a set of monitorable indicators.</p>	<p>3</p> <p>RDI monitoring can be of significant aid to policy makers as the development of such a monitoring system will facilitate understanding of the evaluation of innovation outputs and the resulting impacts as well as provide objective evidence that aid policy makers in terms of terms of setting appropriate direction for policy within the area.</p>	<p>2</p> <p>There has been no announced progress on this measure. It should however be noted that the development of such a monitoring system would require the cooperation and information provision by an extensive range of stakeholders which may implicitly result in slowing its pace of implementation.</p>	<p>3</p> <p>Although this recommendation has not been brought forward as a recommendation in this report it should be noted that its implementation is nonetheless still fully endorsed.</p>
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**Table 5.7 Infrastructure and the Real Estate Market**

<i>Criteria</i>			
Recommendation	Implementation Priority	Implementation Progress	Consistency with NPR 2020 Recommendations
	Score (1-5)	Score (1-5)	Score (1-5)
<p><b>5.1:</b> Evaluating and strengthening the framework for public infrastructure investment management, including through the consideration of well-defined project appraisal and selection criteria and more holistic public investment management. The social viability of all major infrastructure projects should be scrutinised by the undertaking of economic Cost Benefit Analysis, Social Impact Assessments and Environmental Impact Assessments.</p>	<p>5</p> <p>Given the impact of infrastructure on Malta's resources, a holistic analysis is critical for sustainability and effectiveness.</p>	<p>4</p> <p>Today all major infrastructure projects are subject to this holistic analysis and are also made public.</p>	<p>4</p> <p>Infrastructure and the real estate market remain key tenants of a country's competitiveness as outlined in the NPR2020. Investments in supporting the national infrastructure have continued and are needed to enhance Malta's future preparedness. On the other hand, the sustainability of the property market is also critical. The NPR 2020 looks at the transformations needed for these sectors to contribute to the transition to a green economy. As Government is finalising its Near</p>

<p><b>5.2:</b> Boosting infrastructure maintenance spending to make the most out of existing infrastructure.</p>	<p>5</p> <p>Over time infrastructure wears out and regular maintenance will support and extend the lifespan of such infrastructure.</p>	<p>4</p> <p>Maintenance works on various infrastructure projects, especially roads, have started. This trend should continue going forward. Government has also launched a number of regeneration projects mainly involving the development of industrial estates.</p>	<p>Zero-Carbon Strategy, these sectors have to play a key role. There is no doubt that Government support through incentives and also correction of market failures especially in financing will be needed. Finally, the onset of COVID-19 has definitely impacted the sectors and Government's countercyclical measures have supported the sector throughout this critical phase. At this stage, further investment in infrastructure should be linked to Europe's Green deal and Green recovery plan, as outlined in the Environmental Recommendations in this report.</p>
<p><b>5.3:</b> Ensuring infrastructure project pipeline can be financially sustained over the medium to long term by solidifying Government's fiscal position and through efficient utilisation of funds from the EU structural &amp; cohesion funds, and the NDSF.</p>	<p>4</p> <p>The absorption of EU funds has supported Malta's investments in the sector and as the country is about to start benefiting from the new programming period, focus must be given on infrastructure development.</p>	<p>4</p> <p>Various projects across different types of infrastructure are currently being financed through European funds including the Marsa flyover project and other arterial roads across Malta &amp; Gozo. This implementation and absorption of funds should continue.</p>	

<p><b>5.4:</b> Alleviating infrastructure gaps by addressing private market financing failures, considering options such as market-based instruments, concessions, Private-Public Partnerships (PPPs), etc.</p>	<p>4</p> <p>Addressing market failures through PPPs could be an important economic stimulus especially through the regeneration of government buildings but also in terms of financing. The Malta Development Bank has an important role to play.</p>	<p>3</p> <p>Throughout COVID, the Malta Development Bank filled an important gap in financing instruments proving its key role. Further instruments together with PPP programmes should be launched.</p>	
<p><b>5.5:</b> Development of a well-defined statistical framework for the evaluation of infrastructure investments that supports research and policy in the area</p>	<p>4</p> <p>Evidence-based policy-making and investment decisions are especially critical for a small island state like Malta. Developing the right statistics and modelling tools are imperative going forward.</p>	<p>2</p> <p>There has been no announced progress on this specific measure.</p>	
<p><b>5.6:</b> Ensuring that Government policy incentives do not contribute to property market overheating</p>	<p>4</p> <p>Property overheating can have significant implications in Malta's real-estate market. The sustainable trajectory of this important pillar of the economy is critical.</p>	<p>3</p> <p>Government has launched various counter-cyclical measures to support the industry during the pandemic. These measures should continue to support this sector.</p>	



<p><b>5.7:</b> Comprehensive assessment and measures towards addressing the affordable/ social housing issue</p>	<p><b>5</b></p> <p>Social housing remains an important safety-net for various cohorts of the population. With over 80,000 individuals at risk of poverty, social housing is critical.</p>	<p><b>4</b></p> <p>Government has launched and is in the process of finishing off a significant investment in new social housing units together with the refurbishment of older units.</p>	
<p><b>5.8:</b> Collection of more regular and detailed data on the property market to support evidence based policy making</p>	<p><b>5</b></p> <p>The property market has profound implications on Malta's economy both on a short- and long-term horizon. More accurate data on buildings needs to be collected for decision-making to be based on the latest data.</p>	<p><b>3</b></p> <p>Progress on this has been slow. Although various indices are being published by the NSO and CBM and the recently launched rent reform allows for such data collection; more data and models are needed.</p>	
<p><b>5.9:</b> Efforts to overcome barriers and promote the diffusion of environmentally sustainable construction activities</p>	<p><b>5</b></p> <p>Construction has seen a notable increase in activity and can be a main driver of sustainability practices in Malta.</p>	<p><b>3</b></p> <p>There needs to be a concerted effort to support the transition towards more sustainable practices and technologies. A scheme for more efficient equipment has been launched however such schemes should be replicated to support the use of sustainable building products and methods.</p>	

# Chapter 6

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## Conclusion



It is impossible to ignore the consequences that COVID-19 has caused and the obvious need for recovery from the effects of the crisis. We believe that the recovery will only be successful if it is accompanied by the restructuring over a period of time of our economy: we need to focus on reconstruction as well as on recovery.

We cannot simply restore what existed in the past: we need to restructure and improve it. Restructuring and increasing productivity will have to be based on the principles underpinning our society: safeguarding human and social rights, democratic values and the rule of law, and unlocking the potential of our human capital, ingenuity and innovative ideas, progressing towards a more sustainable economy that helps achieve, at EU level, the Sustainable Development Goals (SDGs), with a strong emphasis on a circular economy and policies and measures aimed at climate neutrality in the EU by 2050 at the latest.

Assessing the full impact of COVID-19 is deemed premature at this stage but it is abundantly clear that we need to act now to plan and support economic recovery. There is no time to lose but we should take comfort from the fact that the crisis has occurred at a crucial moment for our economy: in a transition phase towards a digital economy sensitive to economic, environmental and social sustainability. The digital economy is something the Maltese Islands can fully exploit and be an integral part of the strategy for economic recovery as will be the EU Green Deal. The Next Generation EU, as well as, the 2021–2027 EU Multiannual Financial Framework (MFF) provide adequate financial opportunities for the Maltese Islands to restructure our economy and boost recovery.

However, we cannot ignore the immediate, and we believe that the emergency measures have also been highly appropriate. Reality on the ground revealed that in a period of crisis, we tend to be better off to manage on our own, seeking support from the EU at a stage where we have fully grasped what is required. Whilst recognising the relevance of instruments to support Malta-based businesses to overcome the crisis, by making it easier to support and promote investments, increase the capitalisation of companies as well as enhancing banks' capacity to finance the recovery, additional resources are deemed necessary to unleash human capital potential, and create the necessary framework for private sector and foreign direct investment which as shown by this study helps boost productivity.

True, uncertainty remains very high at the moment, but the current situation should not be seen as a phase of cyclical economic development, but also and perhaps more importantly as a decisive moment in terms of structural change towards a more resilient and sustainable economy. Our aim should be to design and implement major quantitative and qualitative changes to our economy as listed in the chapter outlining the recommendations. The aim is to re-think our socio-economic and environmental model and to prepare for a world that is increasingly based on information, digitalisation, and a workforce that has the skills and competencies required of a modern economy. The pandemic exposed particular vulnerabilities for those whose precarious employment status denied them adequate social protection. As stressed in this Report, fair and adequate working conditions, besides opportunities for development, are absolutely necessary to boost productivity. In our view there is no other way.

The process of recovery and reconstruction should therefore include: pursuing the necessary structural changes and connected investment activities, mainly in the area of digital, smart and social innovations as well as the green transition; boosting the human capital potential in the Maltese Islands; creating the conditions to support private sector investment; and supporting access to the labour market of all communities in the Maltese Islands to develop an inclusive and resilient workforce.

In essence Malta's reconstruction and recovery plan and any economic plan for that matter must put people at the forefront of its policies. This is what we have recommended throughout this Report. Maintaining as much net employment as possible in the short term is crucial in our view, and that has been the case since the outbreak of COVID-19. However, it is also crucial to look beyond the here and now and rebuild an economy that as much as possible is future-proof and meets the needs of society, improves the quality of life of Maltese citizens, uses resources efficiently and improves working conditions by helping workers develop the necessary skills and competencies required in a sustainable economy where productivity gains are acquired through investment in human capital. The participation of all citizens, through the organisations of the social partners and of civil society is deemed critical to support the restructuring of our economy towards the path as indicated above.

In the present circumstances, the stronger the recovery measures and the more relevant they are to our potential, especially in areas such as digitalisation, the better

are the prospects of success. We need to boost productivity in the real economy via diverse business models, but we need urgent action in this area if we are to avoid unemployment both in the short and long-term. This means Government providing support packages and a favourable environment for SMEs and industry. SMEs as we know are the backbone of our economy (as is the case across the EU) and need targeted support. Here, allowable subsidies, loans, ensuring liquidity, tax incentives, favourable conditions to retain and employ staff, a review of the bankruptcy legislation and other support instruments, will be critical.

We need productivity in the real economy (this means jobs, purchasing power and basic products and services). This productivity may take a different form and be provided by diverse business models, but we need action in this area if we are to avoid further widening inequality gaps. This kick-start means support packages and a favourable environment for businesses.

Well-coordinated European industrial policy is also needed, while taking into account both the current challenges of the COVID-19 and post-COVID-19 situations and the digitalisation and sustainability aspects. This must be supported by massive investment in sustainable economic and company structures and the creation of high-quality regular permanent contracts. Realising the innovation potential of small and medium-size enterprises and moving towards a circular and climate-neutral economy could ensure not only long-term resource security but also short-term supplies important for future challenges.

New types of locally-based businesses and sectors (and not just in services) need to be identified and supported, from human resource development to research and innovation. These businesses must be sustainable, willing to invest in staff, and to take part in the Green Deal by prioritising environmentally friendly measures. Cultivating this sense of enterprise is a challenge in itself, but we believe it is a challenge worth pursuing since it will help contribute to shared prosperity, particularly in education, innovation and creativity, rather than economic growth built to a degree on low pay and inadequate environmental standards.

In fostering the transition towards a more sustainable and resilient economy, it is vital that policies and measures that support this transition are put into place as early as possible. This includes policies aimed at providing the stimulus towards a green

economy. Again, measures should be targeted to provide economic support and incentives to sectors with maximum positive effect on aggregate demand.

Aiming for maximum economic output, the stimulus towards a green economy should target sectors which provide significant potential for job creation, under the condition that adequate skills are available. In our view, the path towards a green economy is fully compatible with productivity objectives if measures taken help reduce costs particularly utilities.

COVID-19 has shown that the digital revolution could play a critical role in increasing our societies' crisis resilience. Investing in the digitalisation of essential services and increasing the ability of our public administration and public regulators to deliver their services efficiently and effectively is vital to support sustainable economic growth. At the same time, digital technologies are a means to an end and that developing human resources should always be the priority for our economy. Hence, as stressed in chapter 5, which also provides an update on 2019 NRP recommendations, there is a need for investment in retraining programmes for sectors that are unlikely to be future proof.

Finally, we need to continue investing more in public services because such services have a crucial role in supporting investment across all sectors of our economy.

the 1990s, the number of people in the world who are under 15 years of age is expected to increase from 1.1 billion to 1.5 billion.

As the world's population grows, the demand for food and other resources will increase. This will put pressure on the environment and on the world's food supply.

One way to meet this demand is to increase the amount of food that is produced. This can be done by using more land for agriculture.

Another way to meet this demand is to increase the efficiency of food production. This can be done by using better farming techniques.

One of the most important ways to increase the efficiency of food production is to use fertilizers. Fertilizers help plants grow faster and produce more food.

There are many different types of fertilizers. Some are made from natural materials, and some are made from synthetic materials.

One of the most common types of fertilizers is nitrogen. Nitrogen is an essential nutrient for plants, and it is found in many different fertilizers.

There are many different ways to apply fertilizers to crops. Some are applied to the soil, and some are applied to the leaves of the plants.

One of the most important things to remember when using fertilizers is to use them correctly. If they are not used correctly, they can harm the environment and the crops.

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