REPUBLIC OF CYPRUS

CYPRUS ECONOMY AND COMPETITIVENESS COUNCIL

2019 Cyprus Competitiveness Report

Table of contents

Preface 5

Forewords 6

Executive Summary 9

Acronyms and Abbreviations 12

1 Context and aims 14
- 1.1 Cyprus' competitiveness challenges 14
- 1.2 Aims and outline of the Report 16

2 Competitiveness definition and framework 18
- 2.1 Defining competitiveness 18
- 2.2 Competitiveness framework 19

3 Overview of the Cyprus economy 26
- 3.1 Economic structure 26
- 3.2 Economic Developments 30
- 3.3 SPEs in the Balance of Payments 45

4 Introduction to benchmarking Cyprus' competitiveness 49
- 4.1 Cyprus in international competitiveness reports 49
- 4.2 The benchmark countries 55

5 Competitiveness outcomes 60
- 5.1 Productivity 60
- 5.2 Trade and foreign direct investment 63
- 5.3 Employment and jobs 67
- 5.4 Costs and prices 68

6 Benchmark of institutional & organisational competitiveness drivers 71
- 6.1 Market conditions & institutions 71
- 6.2 Business environment & institutions 77
- 6.3 Industry structure, specialisation & organisation 87
- 6.4 Firm characteristics, dynamism & sophistication 88

7 Benchmark of input factor competitiveness drivers 94
- 7.1 Human capital 94
- 7.2 Technology, innovation and knowledge 102
- 7.3 Financial infrastructure 110
- 7.4 Productive and physical infrastructure 114

8 Social and environmental sustainability 121
- 8.1 Social performance 121
- 8.2 Resource use and environmental performance 124

9 Competitiveness of the ICT services sector 130
- 9.1 ICT services in Cyprus 130
- 9.2 ICT sector policies and other initiatives 145
- 9.3 SWOT analysis and recommendations 147

10 Key competitiveness issues and policy responses 150
- 10.1 Cyprus' competitiveness performance 150

10.2 Cyprus' competitiveness issues and policy responses 152
10.3 Towards a long-term strategy 163
10.4 Competitiveness institutions 167

Bibliography 168

Annex I: Competitiveness definitions and concepts 170

Annex II: Competitiveness scorecard 178

Preface

The Cyprus Competitiveness Report 2019 was made possible through the support and funding of the European Commission Structural Reform Support Service (SRSS), providing technical assistance to the Government of Cyprus.

The report was prepared by Ecorys. The authors are Paul Baker, Michael Fuenfzig, Simone Snoeijenbos and Alexandros Vigkos. They were supported by Carlo Arguelles, Giacomo De Amici, Lars Meindert, Anita Peeters, Nora Plaisier, Giorgio Rando, David Regeczi, Nick Rundberg, Claire Selbeck, Tahmina Shafique, Anne Winkel and Sven Zondervan.

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We also like to convey our sincere gratitude to the Economy and Competitiveness Council and its chairman, Takis Klerides, for helpful comments and feedback. We also thank the many stakeholders in the private sector, in government agencies and in academia that made themselves available for interviews.

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This report is based on more than 150 statistical indicators, benchmarking Cyprus competitiveness performance over time and against 12 countries as well as the European Union average. This approach comes with several advantages: it covers a wide range of competitiveness areas, provides an objective and evidence-based picture, and allows for future updates in a consistent manner.

However, there are some limitations. Most importantly, the choice of countries against which Cyprus is compared influences perceptions of its performance. This report compares Cyprus against some of the best performing countries in Europe, which should be seen as a reflection of the country's ambition to be a top-tier location to do business.

Forewords

Foreword by the Minister of Finance

Improving the competitiveness of the economy has been one of the government's key priorities. Having restored the soundness of public finances and having re-established financial stability, a series of structural reforms aims at making the economy more competitive, resilient and diversified. Progress has been achieved on most fronts and the economy has returned to robust growth, expanding at high rates, reflected also in very substantial improvements in the labour market. Markets have acknowledged these positive developments, leading to multiple upgrades of the country's sovereign credit ratings, and enabling Cyprus to access international capital markets on improved terms.

However, this success has not led to complacency. On the contrary, the government is determined to preserve and strengthen the robustness of our economy. We know we can do even better, and we aim to reinforce Cyprus' potential to achieve sustainable growth rates in the long-term. For this to happen, we need to unleash the productive potential of our economy, with less bureaucracy, more efficiency and upgraded competitiveness.

In this effort, continuous policy development as well as monitoring and benchmarking Cyprus' performance is necessary for steering actions towards a more attractive business environment and a more efficient functioning of the economy. In this context, the Economy and Competitiveness Council was established by a Council of Ministers Decision in June 2018, both in response to the Recommendation by the Council of the EU for the creation of national productivity boards, as well as in line with the government's determination to proceed with a more systematic monitoring, independent analysis and enhancement of policies for the improvement of competitiveness.

Just less than a year on, I am very pleased to introduce this first Competitiveness Report, which provides a comprehensive and objective assessment of the competitiveness of the Cyprus economy, in the context of a broad definition of the term competitiveness, encompassing also social and environmental sustainability. The report shows the progress achieved but also points to several competitiveness issues that still need to be addressed and makes recommendations for areas where policy actions are required to address the existing challenges.

I would like to welcome the publication of the Report and to thank the Chairman and members of the Economy and Competitiveness Council for overseeing its preparation and to also express the certainty that this will be a useful instrument in the hands of the Council for providing policy analysis and recommendations to the government, but also for policy makers and analysts, as well as a wider audience.

Harris Georgiades
Minister of Finance

Foreword by the Chairman of the Economy and Competitiveness Council

The Cyprus Economy and Competitiveness Council, established in June 2018, aspires to effectively contribute to the goal of a highly competitive Cypriot economy, with the ultimate aim of sustainable economic growth and long-term prosperity for citizens. These aims are at the core of our discussions with stakeholders and our policy recommendations to the government. Although competitiveness is a complex and multidimensional concept, it is clearly related to the creation of the right conditions for businesses and citizens to prosper not only today but also in the longer-term, and it is thus a key criterion for assessing the sustained success of an economy.

This first Competitiveness Report for Cyprus has been prepared with the aim of constituting a useful tool for identifying and assessing the level, drivers and outcomes of the economy's competitiveness. The analysis in the report is based on more than 150 indicators and on benchmarking Cyprus' competitiveness performance over time and against twelve benchmark countries as well as the European Union average. It thus endeavours to offer a comprehensive, objective and detailed assessment of Cyprus' competitiveness performance that can help identify key challenges and suitable policy actions to tackle these. The report is also intended to serve as a baseline for future updating and monitoring of the country's competitiveness performance. Its readers, whether policy makers, investors or a wider audience, can get a thorough yet concise view of the country's competitiveness profile.

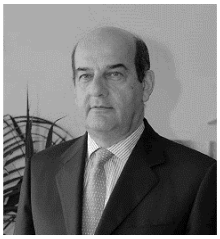
It is acknowledged that, following the economic crisis, Cyprus has returned to a path of sustainable public finances and financial stability. Decisive steps were taken in implementing a reform agenda geared to competitiveness, improving the business environment, attracting investment, diversifying the economy and supporting balanced growth. As a result, after three consecutive years of robust growth, the economy continued to expand solidly in 2018 and recorded one of the strongest growth rates in the Euro area.

Despite the progress achieved, not all structural weaknesses have been addressed fully and there is still a need for further improvements in Cyprus' underlying competitiveness fundamentals. Now, more than ever is the time for further profound changes and introducing the necessary reforms to eliminate the remaining structural weaknesses and distortions, with the aim of increasing the competitiveness and resilience of the economy.

The report points to these competitiveness issues. Overall, competitiveness, as reflected in several international benchmarking reports and indicators, is not yet satisfactory. Although progress has been recorded over time in certain areas, Cyprus lags behind some benchmark countries and the EU average when it comes to indicators of productivity, international trade and foreign direct investment. On the other hand, Cyprus has strong service exports, performing above the EU average. Cyprus also performs well when it comes to broad regulatory, institutional and market conditions, while, in addition, many policies are in place to address competitiveness issues and support key sectors such as ICT services and R&D. At the same time, the analysis shows that underlying competitiveness issues include a rather weak business sector, low entrepreneurship and firm dynamism, relatively low rates of business innovation and adoption of digital technologies, despite academic excellence, limited access to alternative forms of financing and, despite a highly-educated workforce, the presence of skill mismatches. The report also provides recommendations on areas to address in order to tackle the key identified competitiveness issues. These will be taken into account by the Council in formulating our next set of policy proposals to the Government.

I would like to thank the Structural Reforms Support Service of the European Commission for supporting this project as well as the Ecorys team for developing this report, with contributions of key stakeholders from both the private and the public sector of Cyprus.

We look forward to utilizing this report as an analytical tool for informing our dialogue with stakeholders and the government, in order to formulate policies and measures that can promote a strong, resilient and competitive economy, ultimately supporting sustainable long-term growth and prosperity for our citizens.



Takis Klerides
Chairman, Cyprus Economy and Competitiveness Council

Executive Summary

The Government of Cyprus has been implementing an ambitious reform program. Recognising the need for reform after the 2008 global financial crisis and the 2012-13 domestic fiscal and banking crisis, the Government of Cyprus embarked on an ambitious reform program. Fiscal and financial reforms introduced under the Economic Adjustment Programme and beyond have brought down the public deficit, turning it into a surplus since 2016, thereby securing the sustainability of public debt. The Cypriot banking sector has gone through a reformation phase and is now in a strengthened capital and liquidity position. Meanwhile the Action Plan for Growth and the National Reform Programme have pursued structural reforms to strengthen the economy's competitiveness. These include reforms to the public administration and justice system, as well as the creation of new institutions in important horizontal areas such as competitiveness, research and innovation. They also include programmes to improve access to finance and support entrepreneurship. Economic growth of 4 percent was recorded in 2018, one of the highest growth rates in the European Union. The unemployment rate dropped to around 7 percent, down from its peak of 16 percent in 2014. Cyprus' return to investment grade in 2018 confirms the progress achieved over the last few years.

The first of its kind for Cyprus, this report assesses the country's competitiveness performance and its determinants. It identifies key challenges and provides suitable policy actions to tackle them. It is an important resource for policy makers and can be used for broader discussions. Rather than focusing on competitiveness outcomes, this report places major emphasis on the identification and assessment of the factors that explain Cyprus' competitiveness. To this end, the report offers a comprehensive and detailed assessment of relevant indicators, alongside the policy context and other drivers that shape the development of Cyprus' competitiveness.

National competitiveness is understood to consist of the set of institutions, policies and other factors that underpin and uphold value creation by enterprises within a country and, thereby, support high and rising living standards of its citizens on a sustainable basis. Based on this definition, competitiveness indicators are organised and categorised within a broad competitiveness framework. The framework used in this report distinguishes several categories of competitiveness indicators, namely:

- *Competitiveness objectives*. The ultimate aim of competitiveness policy;
- *Sustainability conditions*. Necessary for achieving and maintaining competitiveness in the long-term;
- *Competitiveness outcomes.* As the yardstick for assessing competitiveness performance through key performance metrics;
- *Competitiveness drivers*. A combination of production inputs as well as market and institutional conditions that affect the environment in which enterprises operate and create value; and
- *Endowments* and *exogenous factors*. Factors that affect competitiveness that cannot be changed through public policy.

Cyprus performs reasonably well in leading international competitiveness rankings without being a top-performing country. Cyprus ranks reasonably well in the World Economic Forum Global Competitiveness Report, the IMD World Competitiveness ranking, and the World Bank Doing Business index. However, Cyprus is not amongst the top performing countries. Over the years, Cyprus' position has fluctuated considerably, and suffered a setback during the 2012-13 fiscal and banking crisis and its aftermath.

This report benchmarks Cyprus against 12 countries. The choice of countries is based on multiple criteria, including economic size, geographical proximity (particularly if the country is a peripheral EU location), and competitiveness track record. These countries are Denmark, Estonia, Finland, Germany, Greece, Ireland, Malta, the Netherlands, Portugal, Slovenia, the UK, and Israel, as the only non-EU country. The choice of these mostly highly competitive countries reflects the ambition of the Cyprus government to catch-up with the best performing countries.

Cyprus' productivity performance was adversely affected by the 2008 global financial crisis and the 2012-13 fiscal and banking crisis but remains comparable to other Mediterranean economies. Labour productivity in Cyprus is below the EU average and lags behind Northern European economies, but is comparable with or exceeds labour productivity in other Mediterranean economies. Total factor productivity in Cyprus has stabilised in recent years, after an initial decline that was greater in Cyprus than in any other benchmarked country except Greece.

Cyprus has strong service exports but relatively weak inward FDI performance and employment creation, compared to the benchmarked countries. As a share of GDP, Cyprus' overall exports are above the EU average, with an emphasis on service exports. Cyprus is one of the few countries with a negative current account balance. Foreign direct investment inflows are relatively modest, after accounting for FDI driven by special-purpose entities. Employment levels suffered significantly after the 2008 global financial crisis and the 2012-13 banking and fiscal crisis, though they are continually recovering, with the employment rate reaching around 74 percent in 2018.

Of the more than 150 statistical indicators in this report, almost 100 are for competitiveness drivers across eight broad themes. The main themes treated in the report are:

1. **Market conditions and institutions**, referring to how well markets function and how well their functioning is supported by institutions;
2. **Business environment and institutions**, referring to the legal, administrative and regulatory environment for businesses;
3. **Industry structure, specialisation and organisation**, referring to the structure of the economy, the production of goods and services, the level of economic specialisation or diversification, how production is organised (for example, in value chains or in clusters), and whether intermediate inputs can be sourced domestically;
4. **Firm characteristics, dynamism and sophistication**, referring to the size and structure of firms, the dynamism of businesses (such as new business creation and high-growth enterprises), the level of entrepreneurship and entrepreneurial attitudes, and the sophistication of businesses and management quality;
5. **Human capital**, referring to the availability and quality of the workforce;
6. **Technology, innovation and knowledge**, referring to public investments into technology and innovation, the knowledge infrastructure, and the technological and innovation characteristics of firms. These reflect the importance of technological breakthroughs and technology-based innovations as the basis of many productivity gains;
7. **Financial infrastructure**, referring to the institutions that provide access to finance and financial services;
8. **Productive and physical infrastructure**, referring to infrastructure such as transportation, utilities or telecommunications.

The report also presents an in-depth discussion of the ICT services sector as an example of a particularly dynamic sector as well as an example of how the competitiveness framework can be extended to assess sectoral competitiveness. **ICT services is a developing sector in Cyprus, with an emergent ecosystem and supportive public policies and infrastructure.** It is an emerging sector in Cyprus, with the turnover having grown from €1.1 billion in 2008 to more than

€2.8 billion in 2016. The ICT ecosystem in Cyprus is also emerging. Cypriot universities already offer a large variety of ICT-related study programmes and host various digital innovation hubs. There are also various incubators and accelerators, providing support to ICT start-ups.

In general, public policy is supportive of the ICT services sector. In particular, the Digital Strategy for Cyprus sets out a comprehensive strategy for promoting ICT use in all sectors of the economy. Further improvements could be made in the coordination and acceleration of policy implementation, the promotion of digital skills acquisition, the promotion of foreign direct investment in ICT services, the provision of digitalisation incentives for key sectors of the economy, and the forward-looking provision of regulatory frameworks for new and game-changing technologies.

With regards to national (not sectoral) competitiveness, **broad regulatory, institutional and market conditions in Cyprus are good** and are in line with those throughout the EU. Moreover, many policies are in place or are under consideration to address competitiveness weaknesses. While policy measures have been taken in the relevant areas, their effectiveness warrants additional evaluation to seek further improvements. In many instances, the country requires no new public policies, but rather more emphasis on the effective implementation and coordination of existing ones.

The indicator analysis identifies several areas where competitiveness could be enhanced. Notwithstanding the generally good regulatory, institutional and market conditions in Cyprus, recommendations for further improvement include:

- To promote **entrepreneurship and firm dynamism**, developing a holistic approach that acknowledges the interaction of entrepreneurship with other policy areas, such as access to finance, education, business linkages and external connectivity;
- To strengthen **business linkages and interaction**, supporting the integration of Cypriot firms in the supplier networks of large international companies, and further enhancing connectedness and collaboration between the business community and tertiary-level education and research;
- To boost the **adoption of digital technologies**, providing digitalisation incentives for key sectors of the economy, strengthening education and training for digital skills, and incentivising productivity-enhancing investments, especially for ICT assets;
- To improve **access to finance,** continuing the successful efforts to strengthen the banking system, but also improving access to, and the availability of, alternative sources of finance;
- To future-proof the availability of **skills** and **human capital**, raising the number of graduates with technical and natural-science qualifications and strengthening education and training for digital skills and entrepreneurship. Monitoring current and future skill requirements should also be completed to ensure that skill needs of economic sectors are met;
- To strengthen **external connectivity**, formulating an international transportation and connectivity strategy and assessing options to incentivise international connectivity to business partner locations.

In addition to addressing competitiveness weaknesses, a long-term vision and strategy for competitiveness is required. This strategy should focus on the opportunities and strengths that Cyprus can build on, so that it can continue to transform its economy towards high growth and high value-add sectors. Opportunities and threats to both 'traditional' and emerging sectors also need to be systemically identified and monitored. This continuous appraisal of developments inside and outside Cyprus against long-term strategic objectives would be particularly helpful for identifying promising sectors and activities, as well as for formulating policies that support and promote these promising sectors and activities.

Acronyms and Abbreviations

AROPE	At Risk of Poverty or Social Exclusion
CARG	Compound Annual Rate of Growth
CCB	Cyprus Cooperative Bank
CCS	Cyprus Computer Society
CEPEJ	Council of Europe European Commission for the Efficiency of Justice
CITEA	Cyprus Information Technology Enterprises Association
COSME	Competitiveness of Enterprises and Small and Medium-sized Enterprises
CYSTAT	Statistical Service of Cyprus
CYTA	Cyprus Telecommunication Authority
DESI	Digital Economy and Society Index
DG EPCD	Directorate General for European Programmes, Coordination and Development
DMC	Domestic Material Consumption
EBRD	European Bank for Reconstruction and Development
ECC	Economy and Competitiveness Council
EDGI	E-Government Development Index
eGIF	E-Government interoperability framework
EIB	European Investment Bank
EPI	E-Participation Index
EPO	European Patent Office
ERP	Enterprise Resource Planning
EU	European Union
FATS	Foreign Affiliates Statistics
FDI	Foreign Direct Investment
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
GEDI	Global Entrepreneurship Development Index
GERD	Gross Domestic Expenditure on R&D
GII	Gender Inequality Index
GII	Global Innovation Index
GNI	Gross International Income
GVA	Gross Value-Added
HICP	Harmonised Index of Consumer Prices
ICT	Information and Communications Technology
IMD	International Institute for Management Development
IMF	International Monetary Fund
INSEAD	Institut Européen d'Administration des Affaires
IPR	Intellectual Property Rights
IPRI	Intellectual Property Rights Index
IT	Information Technology
JRC	Joint Research Centre
Kwh	Kilowatt Hour

LFS	Labour Force Survey
LPI	Logistics Performance Index
Mbit	Megabit
NACE	Nomenclature Statistique des Activités Économiques dans la Communauté Européenne
NEET	Neither in Employment nor in Education and Training
NIIP	Net International Investment Position
NRP	National Reform Programme
OECD	Organisation for Economic Co-operation and Development
PISA	Programme for International Student Assessment
PPS	Purchasing Power Standard
PRO-SERV	Professional Services Restrictiveness Index
R&D	Research and Development
RIO	Research and Innovation Observatory
RISE	Research Centre on Interactive Media, Smart Systems and Emerging Technologies
RVO	Rijksdienst voor Ondernemend (Netherlands Enterprise Agency)
SBA	Small Business Act
SILC	Statistics on Income and Living Conditions
SME	Small-and Medium-Sized Enterprise
SPE	Special-Purpose Entity
SSRS	Structural Reform Support Service
STEM	Science, Technology, Engineering, and Mathematics
SWOT	Strengths, Weaknesses, Opportunities and Threats
TFP	Total Factor Productivity
TiVA	Trade in Value-Added database
TOE	Thousand Tonnes of Oil Equivalent
UK	United Kingdom
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
VAT	Value-Added Tax
WEF	World Economic Forum
WIPO	World Intellectual Property Organization
y-o-y	Year-over-Year
ytd	Year to Date

1 Context and aims

Recognising the need for reforms after the 2008 global financial crisis and the 2012-13 domestic fiscal and banking crisis, the Government of Cyprus has embarked on an ambitious reform program. In the context of the economic adjustment program, fiscal and financial reforms brought down the deficit and stabilized the banking sector. In the context of the Action Plan for Growth and the National Reform Programme, structural reforms are aiming to strengthen the competitiveness of the economy. This includes, among others, reforms to public administration and the justice system, or programmes to improve access to finance and support entrepreneurship.

As the first of its kind for Cyprus, this Competitiveness Report is an analytical tool to comprehensively assess Cyprus' competitiveness performance. It identifies key challenges and suitable policy actions to tackle them, thereby providing an important input for policy makers. It also serves as an input for broader discussion and debate. The overarching ambition of this report is to identify and assess those factors that explain Cyprus' competitiveness rather than to describe its outcomes. To this end, the report offers a comprehensive and detailed assessment of relevant indicators, the policy context and other factors that shape the development of Cyprus' national competitiveness.

1.1 Cyprus' competitiveness challenges

Together with Malta and eight countries of Central and Eastern Europe, Cyprus joined the European Union in 2004, adopting the euro in 2008. It is the second smallest economy in the European Union, with an annual GDP of €19.6 billion in 2017, placing it ahead of Malta (€11.1 billion) and behind Estonia (€23.6 billion). Cyprus has the third smallest population in the EU, at 855 thousand, ahead of Malta (460 thousand) and Luxembourg (591 thousand), and behind Estonia (1.3 million).

Cyprus is integrated into the European single market and enjoys market access to third countries through EU trade agreements. Moreover, Cyprus is strategically located at the crossroads of the European Union, Asia, the Middle East and Africa, allowing the country to promote itself as a business gateway between three continents. Notwithstanding recent gas discoveries in its exclusive economic zone, Cyprus has limited natural resources and agricultural potential, with less than 11 percent of the land area being arable. It benefits, however, from a pleasant climate, varied scenery and diverse cultural heritage, which are important assets for the tourism sector and contribute to the agreeable environment for those that live and work on the island.

The combination of being a small and peripheral, but strategically situated country with limited natural endowments drives the pattern of economic specialisation of Cyprus. Services dominate the economy, with agriculture, extractive industries and manufacturing contributing only to a small extent to GDP and employment. Export-oriented service industries, such as financial and business services, as well as the sectors of maritime shipping and tourism have been the mainstay of the economy. Information and communication services along with other professional and administrative services have been growing in importance. Over recent years, Cyprus has also seen expansion in its tertiary education and health sectors.

Given its small domestic market size, its geographic location, and the openness of its economy, Cyprus is heavily exposed to regional and global developments, both economic and political. The economy has, however, shown considerable resilience. Cyprus weathered the 2008 global financial crisis well and, despite suffering because of the 2012-13 domestic fiscal and banking crisis, the economy recovered quickly and strongly.

Nonetheless, these crises revealed institutional and structural weaknesses in the economy, which potentially hamper Cyprus' competitiveness.

The Government of Cyprus has recognised the need for reform, and a major policy overhaul took place as a part of the economic adjustment program and the Action Plan for Growth. These resulted in policy interventions in three main areas: fiscal, financial and structural reforms. Thus, in parallel to reforms aimed at bringing down the deficit, reducing the public debt and stabilising the banking sector, the Government's 2015 Action Plan for Growth focused on short to medium-term structural reform measures to strengthen the economy and facilitate its exit from the crisis.

The Action Plan aspires to develop a more robust, balanced and sustainable growth model for Cyprus that would be less vulnerable to external shocks, create jobs and improve citizens' welfare. The Action Plan's guiding principle is that all tradable sectors of the economy should be governed by an investment-friendly institutional and legal framework. This framework should help to attract resources and investment, thus helping companies to build scale, expertise and competitiveness at a regional and international level. The Plan defines actions and reforms to increase competitiveness by minimising impediments to business growth and by reducing the cost of doing business, thereby enabling Cyprus to become a more attractive place for businesses to invest with confidence. The Action Plan gives emphasis to:

- **horizontal, cross-sectoral measures** to improve the overall business and investment environment, encourage entrepreneurship, and promote e-Government; and
- **strategies for key sectors** of the economy that could contribute significantly to economic growth. These strategies should promote a more diversified growth model and decrease the vulnerability of the economy to sector-specific shocks.

The 2015 Action Plan for Growth, subsequently updated annually, should be seen alongside Cyprus' annually revised National Reform Programme (NRP), which serves as the basic instrument for the implementation of the EU's "Europe 2020" Strategy at a national level. The NRP sets out major reform priorities, for which the 2018 Programme specifies reforms aimed at:

- Continuing the implementation of enhanced fiscal governance;
- Increasing the efficiency of the public and local administration;
- Improving the efficiency of the judicial system;
- Enhancing the implementation of the insolvency and foreclosure frameworks;
- Reducing private indebtedness and the high level of non-performing loans;
- Boosting investment further and improving access to finance, particularly for SMEs;
- Improving the labour-market relevance of the educational system and the quality of active labour market policies, particularly for young people;
- Reforming the health-care system.

The Government authorities have demonstrated a strong commitment to its reform program, which has achieved positive results with fiscal consolidation, financial stability and structural reforms. As a result, economic growth has surpassed expectations: After three consecutive years of robust growth, the economy continued expanding solidly in 2018 and recorded one of the strongest growth rates in the Eurozone, at around 4 percent. The recovery has been broad-based and has contributed to the increase of employment in almost all sectors and to the reduction of unemployment to a five year low, having fallen from 16 percent in 2014 to just above 7 percent in the last quarter of 2018. Positive developments were also recorded in the area of price competitiveness.

What is encouraging for the new growth phase is that, while consumption continued to be a key recovery driver, investment demand also rebounded. The main factor driving the

increase in private consumption was the rise in household income, mainly stimulated by higher employment, and not just wage inflation. Private consumption was also supported by the flourishing tourism sector with positive spillover effects to other sectors of the economy.

Public finances have been consolidated to a large extent, securing the sustainability of public debt. Significant progress has been made to restructure and restore confidence in the Cypriot banking system. Cypriot banks have come a long way and nowadays are on a stronger footing.

The better than expected economic recovery, along with the improved domestic fiscal and financial conditions, have created and maintained an environment of improved confidence, expressed most clearly with the upgrade of Cyprus to investment grade by credit rating agencies. In July 2018, Moody's upgraded the Cyprus sovereign to Ba2 from Ba3 with a stable outlook. In September 2018, Standard and Poor's upgraded Cyprus' long-term credit rating at "BBB-" to investment grade. In October 2018, Fitch also upgraded Cyprus' credit rating to investment grade, to "BBB-" from "BB+". Credit rating agencies have recognised, among others, as strengths of the Cypriot economy the strong institutions and governance, and the highly skilled labour force.

In the light of the stable market backdrop and the recent rating upgrades, in October 2018 the Republic of Cyprus tapped the international capital markets for the third time after the completion of the economic adjustment programme, issuing a ten-year bond of €1.5 billion at a yield of 2,4 percent. Since then, government bond yields have declined to historically low levels, allowing the government to refinance national debt on more favourable rates and with extended maturities. On 19 February 2019, Cyprus successfully launched a new €1 billion 15 year benchmark transaction. Final demand of over €8.1 billion represents the largest orderbook achieved by a Cyprus benchmark transaction since the sovereign's return to the international bond markets in June 2014. The success of this transaction highlights the strong support from the international investor base for Cyprus.

However, looking forward, Cyprus also faces potential challenges and opportunities for future growth and development:

- **external economic conditions**, including, but not limited, the potential for a recurring Euro crisis, an end to low interest rate regimes, an increase in energy prices, uncertainty over Brexit and possible consequential shifts in trade and investment patterns;
- **technological developments,** notably increasing digitalisation, offers opportunities and challenges to an economy that is specialised in service industries, such as professional services, tourism, or corporate and regional headquartering;
- **climate change** may present a significant challenge for Cyprus, given the importance of the country's pleasant climate and environment as a major attribute for its important tourism sector; for example, rising temperatures, drier conditions and more extreme weather events could place considerable strain on the island's resources (e.g. desertification, water scarcity, coastal damage);
- **regional socio-political developments** expose Cyprus to instability from the Middle East but also emphasise the country as a safe and secure location for business operations in the region. Similarly, economic developments in Russia are important to Cyprus;
- **natural resources,** with the discovery of significant hydrocarbon reserves in the its Exclusive Economic Zone providing the potential to encourage investment and job creation in the oil and gas sector and associated support services. This could help diversify the economy away from its heavy reliance on financial, professional and other services, and tourism.

1.2 Aims and outline of the Report

The Action Plan for Growth recognises the importance of monitoring the competitiveness

performance of Cyprus as a first step for assessing progress and taking corrective action. Accordingly, this initial Competitiveness Report for Cyprus is an analytical tool for the comprehensive assessment of Cyprus' competitiveness performance—using international benchmark and other relevant indicators—that identifies key challenges and suitable policy actions to tackle them. The Report provides an important input for policy makers across the Government and can feed broader discussion and debate.

The overarching ambition of this report is to identify and assess those factors that explain Cyprus' competitiveness, rather than to describe its outcomes. It seeks to enlighten understanding of Cyprus relative competitive position and performance, its strengths and weakness, and their causal factors. To this end, the report offers a comprehensive and detailed assessment of relevant indicators, the policy context and other factors that shape the development of Cyprus' national competitiveness. This first Cyprus Competitiveness Report should also serve as a baseline for future monitoring of the country's competitiveness performance.

Briefly, the structure of the report is as follows:

- **Chapter 2** defines competitiveness and provide a competitiveness framework;
- **Chapter 3** provides an overview of the structure and development of the economy of Cyprus over the past decade;
- **Chapter 4** describes Cyprus performance in international competitiveness reports and introduces the benchmark countries used in this report;
- **Chapters 5 to 8** present a comparison of a wide range of competitiveness indicators for Cyprus and selected countries;
- **Chapter 9** offers a specific analysis of the competitiveness of ICT services in Cyprus, discusses current policies and provides recommendations to support improved competitiveness of the sector;
- **Chapter 10** identifies the key competitiveness issues that arise from the indicators, discusses their policy implications, provides recommendations, and considers the possible direction of a long-term (competitiveness) strategy;
- The two **annexes** provide an additional discussion on the definition of competitiveness as well as a scorecard of Cyprus' standing in international competitiveness rankings.

2 Competitiveness definition and framework

This report defines national competitiveness as *the set of institutions, policies and other factors that underpin and uphold value creation by enterprises in Cyprus, and thereby, support high and rising living standards of Cypriots on a sustainable basis*. This definition places an emphasis on the institutions, policies and other factors that make up the environment in which enterprises conduct business and that influence the efficiency and effectiveness of value-creating activities.

To organise and categorise different indicators and measures of competitiveness, this report's framework distinguishes several categories of competitiveness metrics or indicators. These are:

- **Competitiveness objectives.** The ultimate aim of competitiveness policy;
- **Sustainability conditions.** To achieve and maintain competitiveness in the long-term;
- **Competitiveness outcomes.** As the yardstick for assessing competitiveness performance through key performance metrics;
- **Competitiveness drivers.** A combination of production inputs along with market and institutional conditions that affect the environment in which enterprises operate and create value;
- **Endowments and exogenous factors.** The factors affecting competitiveness, while not being changeable by public policy itself.

2.1 Defining competitiveness

Competitiveness is a complex and multidimensional concept with definitions that vary according to context, whether discussed by academics, businesses, politicians, or the public. When applied to the level of firms, the notion of competitiveness is reasonably clear and intuitive, reflecting the ability of firms to compete in markets, obtain market share and generate profits. However, there is considerable debate over the definition of competitiveness at a national level. The debate centres on the factors to include in the assessment of competitiveness performance, and even whether the concept of national competitiveness is useful for formulating public policy.[1] Not least, while competition among firms can be thought of as a zero-sum game—the gain of one firm implies a loss for its competitors—the same does not apply at the level of nations.

Although the concept of national competitiveness is amorphous, efforts to define and assess national competitiveness—often popularised by leading international competitiveness rankings—have coalesced around three core characteristics that define whether a nation can be described as 'competitive':

- **A successful economic performance** that supports rising real incomes, living standards, and well-being of citizens;
- **Open, free, and fair market conditions**; and
- **A sustainable policy environment** that avoids the creation of imbalances that risk compromising successful economic, social and environmental performance in the longer term.

Underpinning these characteristics is the recognition that businesses generate economic wealth and, thereby, improve the economic well-being of citizens. At the same time, the core characteristics defining competitiveness embody the view that well-functioning markets drive the efficient allocation of resources and stimulate innovation, thus maximising returns from production and driving productivity growth.

At its core, a competitive economy does not focus on short-term economic gains that can undermine longer-term growth opportunities. Hence, national competitiveness is not just about creating the conditions for businesses

[1] Annex I of the report introduces this debate and highlights some of the key viewpoints on the concept of national competitiveness.

and citizens to prosper today, but it is also about preparing the conditions that will allow them to prosper tomorrow. An economic system should be resilient, able to respond to changing circumstances and external shocks.

From a policy perspective, national competitiveness means creating an economic environment that supports value creation and economic prosperity both now and for the future. Thus, following the various widely-used definitions, national competitiveness can be encapsulated as follows:

> ***National competitiveness is understood to consist of the set of institutions, policies and other factors that underpin and uphold value creation by enterprises within a country and, thereby, support high and rising living standards of its citizens on a sustainable basis.***

This definition gives a starting point for understanding and evaluating national competitiveness. It places an emphasis on the institutions, policies and other factors that make up the environment in which enterprises conduct business and that influence the efficiency and effectiveness of value creating activities. In this sense, countries compete by providing an environment that better promotes the efficient and effective use of resources (i.e. high levels of productivity), thereby generating profits, high returns on investments, and the creation of well-paying jobs. A country that offers an environment with the right conditions for value creation is more likely to be successful in attracting investment, whether foreign or domestic, and to be better able to produce and export high value-added goods and services. In turn, these attributes provide the basis for high and rising living standards.

However, to answer whether a country is competitive requires more than just absolute comparisons with other countries. Consideration also needs to be given to the country's starting situation and circumstances, including endowments such as natural resources, location, geography, climate, population, and market size, which are unchangeable by public policy. Moreover, a proper assessment of competitiveness should be set alongside national aims and ambitions for economic growth, living standards and well-being of citizens. Such considerations contribute to defining the objectives of national competitiveness and determining appropriate indicators to assess progress towards these objectives.

Consider the "beyond GDP" debate, which looks at whether a narrow focus on standard economic indicators like GDP growth and GDP per capita can properly measure national progress. If the aim of national competitiveness is equated with the well-being of citizens, rather than simply the value-creation performance of enterprises, then it is relevant to incorporate social and environmental dimensions—such as equality, happiness, and 'green' growth—within the evaluation of national competitiveness.

Ultimately, the real question from a public-policy perspective is to ask whether a country is using its competitive potential to the greatest extent possible to achieve its economic, social and environmental goals. And, if not, what opportunities could be exploited better and what actions are necessary to achieve this?

2.2 Competitiveness framework

Alongside the many definitions and interpretations of national competitiveness, there is an abundance of frameworks—available in international competitiveness rankings, national and regional competitiveness reports, and in the academic and business literature—used to describe dimensions of national competitiveness. These frameworks, explicitly or implicitly, reflect the underlying theoretical and analytical concepts of competitiveness employed by their authors, while giving a basis for organising and categorising different indicators and measures of competitiveness. The frameworks may highlight specific aspects and interlinkages that their authors view as particularly important for assessing com-

petitiveness performance or of special pertinence given the characteristics of the economy analysed.

The competitiveness framework used in this report takes a neutral view towards the different theoretical and analytical concepts of competitiveness and the most important determinants and metrics of national competitiveness. Instead, the report uses a broad framework that encapsulates various definitions, concepts, and categorisations of competitiveness indicators used elsewhere, particularly in national and international competitiveness reports and rankings. Accordingly, the competitiveness framework is intended as a pragmatic tool for organising and structuring the presentation and analysis of indicators relevant for assessing national competitiveness.

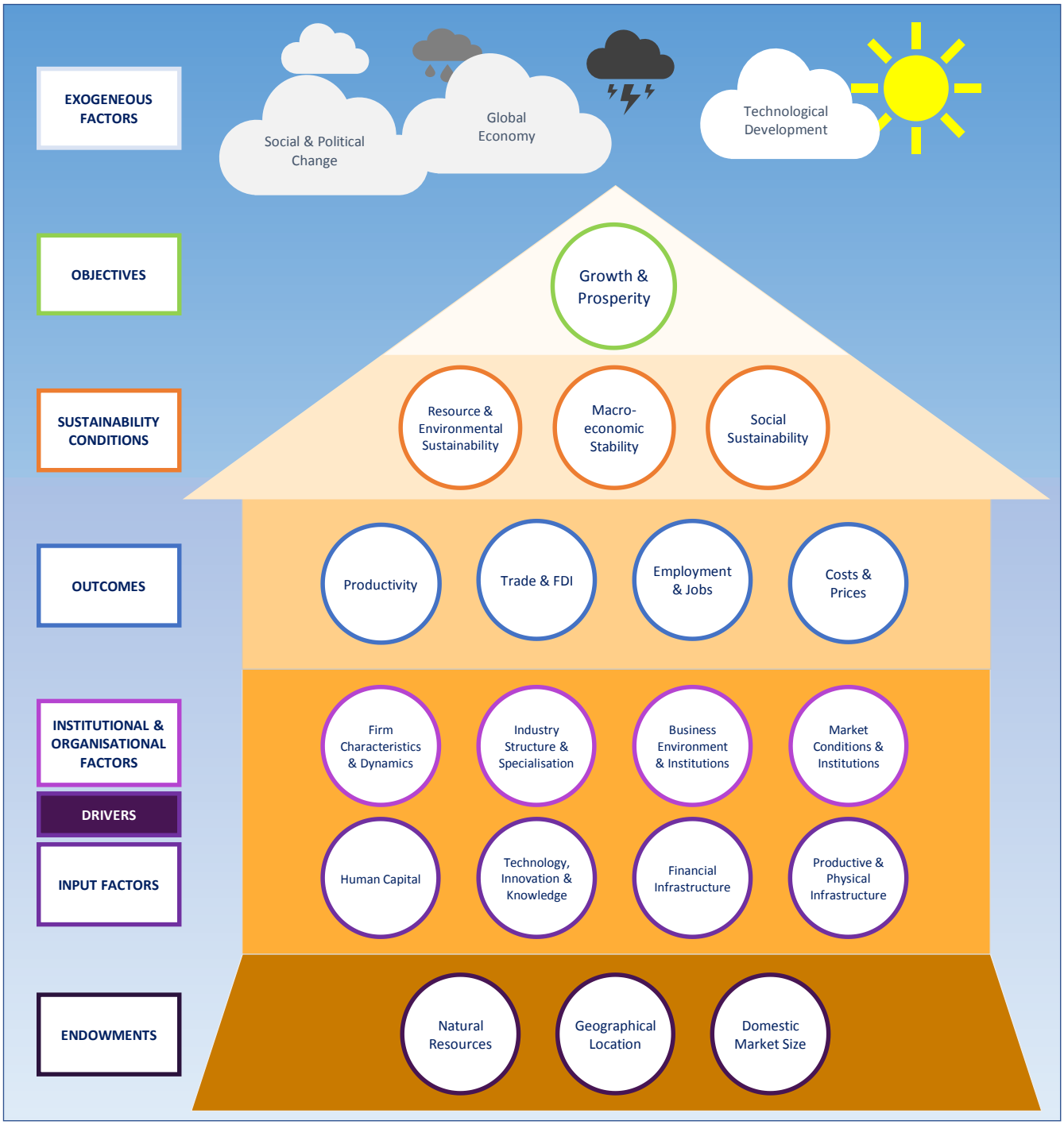
The framework, illustrated in Figure 1, distinguishes six categories of competitiveness metrics or indicators, with associated thematically-linked sub-categories. Briefly, these are as follows:

- **Objectives**: reflecting the overarching aims and ambitions of national competitiveness, interpreted here in terms of the economic growth and prosperity that are the basis for high and rising living standards;
- **Sustainability conditions:** covering the constraints placed on short-term value-creating activities and growth so that national competitiveness can be maintained in the longer term and to ensure that wider non-economic objectives—such as social and environmental well-being—are respected;
- **Outcomes**: which provide a yardstick for assessing the current national competitiveness in terms of key performance or output metrics, such as productivity, trade, etc.;
- **Drivers:** covering a combination of production inputs along with market and institutional conditions that affect the environment in which enterprises operate and create value. These are the areas that are most directly within the scope of influence of public policies and form the focus for the policy-related analysis of competitiveness included in this report;
- **Endowments**: cover factors that can affect national competitiveness but that are either fixed or can be changed only in the long term, such as natural resources, geographical location, and domestic market size;
- **Exogenous factors:** which covers developments and conditions that can affect national competitiveness but are essentially external to the national competitiveness environment. These encompass, for example, global economic conditions, technological developments, and changes to global social and political conditions.

The interlinkages and interactions between and within the different categories and sub-categories of the competitiveness framework are often complex and the categorisation of different elements can be ambiguous. The complex interlinkages and interactions that affect national competitiveness mean that difference in opinion can arise over the correct categorisation of items within the competitiveness framework and their interpretation.

The main categories of competitiveness indicators used in the framework are described in the following sub-sections.

Figure 1 Competitiveness framework



Competitiveness objectives

Competitiveness objectives reflect political and societal choices. They can be defined broadly, as in this report, in terms of economic growth, prosperity and well-being of citizens, or more narrowly, for example in terms of the performance of enterprises and their ability to compete successfully in international markets. The choice of objectives is important as it directly influences the selection of appropriate metrics for evaluating whether a country is successful in pursuit of its competitiveness goals.

However, whether broadly or narrowly defined, achieving the objectives of competitiveness is not something that policy makers can directly control. Rather, public policy plays a role most directly through its influence on factors that shape and drive the competitiveness of enterprises, such as the institutional and organisational factors that affect the business environment, or the input factors, such as human capital or finance, that are available to enterprises.

Sustainability conditions

Political and societal choices influence the conditions or constraints placed on how competitiveness objectives are achieved. Economic crises, climate change and other environmental concerns as well as social conflicts have helped push concerns about the longer-term sustainability of economic growth and competitiveness models towards the forefront of public-policy agendas. Sometimes this has led sustainability criteria to be added to the overall objectives of national competitiveness. While this report treats sustainability conditions separately from competitiveness objectives, it concurs with the view that a country cannot be considered competitive unless short-term gains in growth and prosperity are achieved while simultaneously respecting the requirements of macroeconomic, social, environmental, and resource-use sustainability.

As recent crises have shown, economic growth can be highly vulnerable to international developments, propagating imbalances that undermine macroeconomic stability. Maintaining a sustainable macroeconomic situation—whether with balance of payments, public or private finances and debt levels, or the stability of the banking system—is important to ensure that competitiveness gains are not undermined by imbalances that harm longer-term growth.

The same logic applies to the social sphere. Mutually supportive synergies between economic, social, and environmental performance are increasingly important aspects of overall development and the general well-being of its citizens. A fair and inclusive society is not only an important public policy aim but also, by contributing to social stability and cohesion, can have a vital role in sustaining competitiveness in the longer term. Similarly, environmental degradation and non-sustainable resource use place constraints on future growth opportunities and impose costs on current and future generations.

Competitiveness outcomes

Competitiveness outcomes represent an intermediate level between the underlying factors and policy inputs that drive competitiveness and the overarching objectives of economic growth and prosperity.

The selected outcome categories—*Productivity*, *Trade & FDI*, *Employment & job*' and *Costs & prices*—represent key metrics for the evaluation of national competitiveness performance. They reflect a mixture of the competitiveness outcomes that drive the ability of enterprises to compete internationally (e.g. productivity levels and factor costs) and the fruits of this competition (e.g. trade performance, investment attraction and employment creation).

As with the competitiveness objectives, policy makers cannot directly control competitiveness outcomes. However, public policy has an important role in setting the conditions—covered under the next heading of competitiveness drivers—that influence the likelihood of achieving successful competitiveness outcomes.

Competitiveness drivers

The competitiveness driver category covers the factors and national attributes that contribute to or influence competitiveness outcomes. In contrast to competitiveness objectives and outcomes, public policy has a strong and often direct influence in shaping competitiveness drivers. It encompasses, to a large degree, the set of factors, institutions, and policies that support and sustain value creation by enterprises within a country and, hence, national competitiveness. The competitiveness framework distinguishes two main subgroups of competitiveness factors: institutional and organisational factors as well as input factors.

The category of *Institutional & organisational factors* covers, on the one hand, the institutional (and social) context and market conditions, including the regulatory and other conditions affecting the competitive environment in which enterprises operate. On the other hand, it covers factors that relate directly to the structure, conduct and performance (in terms of production efficiency and innovation) of enterprises and economic sectors. The competitiveness framework distinguishes the following sub-categories of institutional and organisational factors:

- **Market conditions and institutions** are concerned with how well markets function and how they are supported by market institutions. This includes market competition in foreign and domestic markets and the regulatory conditions affecting product and labour markets.[2] Well-functioning markets drive the efficient allocation of resources, stimulate innovation and, thereby, drive productivity growth. This places attention on the institutions that regulate and support markets, such as competition authorities, consumer and labour market regulators and other supporting institutions;
- **Business environment and institutions** are concerned with the legal, administrative and regulatory environment for enterprises and their activities. It includes the effectiveness and efficiency of the public administration and business support institutions, alongside other factors that affect the ease of doing business and the surrounding legal and administrative frameworks in which enterprises conduct their business (e.g. property and other legal rights, taxation). These factors contribute to the financial and time costs of doing business and of regulatory compliance, and support efficient allocation of factors of production, which influences productivity levels and growth;
- **Industry structure, specialisation and organisation** covers the structure of the economy, the goods and services that are produced as well as associated dimensions of specialisation or diversification of economic activities. This sub-category also covers how production is organised (e.g. value chain integration or business clusters) and the availability of domestically sourced intermediate inputs. The composition and organisation of business activities in the economy has an important influence on sector-level and aggregate productivity. Examples include compositional effects (the relative prominence of high or low productivity sectors or activities in the economic structure), specialisation that facilitates integration in global value chains, or cluster developments that are a source of innovation and productivity growth;
- **Firm characteristics, dynamism & sophistication** are concerned with the size and structure of enterprises as well as enterprise dynamism, such as new business creation and the number of high growth enterprises. It also covers aspects such as entrepreneurship, the sophistication of businesses and management quality. These attributes capture the quality of the overall industrial tissue of an economy. They are shaped, however, by other competitiveness factors such as the business environment, market conditions and business-supporting infrastructure (e.g. financial markets), alongside more cultural aspects such as the

[2] Financial market conditions, which are important for Cyprus given the position of financial services in the economy, are covered separately under the input factor sub-category of '*Financial infrastructure*'.

prevalence of family-owned business and general attitudes towards entrepreneurship. The creation and growth of firms is a critical source of productivity growth and employment, while entrepreneurship and high levels of business sophistication also contribute to productivity growth and business resilience. The structure and size of firms and their level of sophistication influence possibilities for realising economies of scale and making the investments necessary to shift to high-value products and production processes. Equally, high levels of entrepreneurship and a prevalence of smaller enterprises are associated with a dynamic and competitive economy.

The category of *Input factors* covers production input factors, such as human capital and labour, technology, finance and infrastructure. The competitiveness framework distinguishes the following sub-categories of input factors:

- **Human capital** concerns the availability and quality of the workforce. It reflects the skills, competences, ideas and other attributes embodied in workers—individually or collectively—that are used to produce goods and services. Human capital is described through indicators of education infrastructure and outcomes, and skills availability. Human capital contributes directly to competitiveness by enhancing the productivity of labour through higher knowledge and skill levels. It also contributes by helping firms to deploy capital goods or technology more effectively, and by facilitating structural transformation towards more productive activities. In turn, this increases workers opportunities to secure high value-adding jobs and correspondingly higher wages;
- **Technology, innovation and knowledge** concerns the infrastructure for research, technology, innovation, and knowledge development, together with firms' technological and innovation characteristics, their intangible assets, and the extent and quality of linkages between research institutions and the private sector. It reflects the importance of technology and innovation as a source of productivity gains, which includes new or upgraded products, production processes, marketing methods, or business organisations (e.g. new ways of organising value chains, business clusters, or other co-operative modes between firms);
- **Financial infrastructure** covers financial institutions and financial services providers that contribute to enterprises' access to finance and financial management. These include banks and other financial intermediaries, capital and financial markets, and public banking institutions. The quality, efficiency and diversity of financial infrastructure contributes to competitiveness through both the provision of financial capital and services that enable enterprises to manage their daily financial affairs and investment activities. Not only is the availability and cost of capital important but, also, the diversity of financial services that are tailored to different enterprise types (e.g. corporate bonds for well-established firms to venture capital for start-ups, and specialised services such as trade credit or services for foreign investors);
- **Productive and physical infrastructure** concerns the availability, extensiveness, and quality of infrastructure that support business activities. It includes transportation infrastructure, such as roads, ports or airports, together with utilities, such as the power grid, water supply, or telecommunications networks. The availability and quality of infrastructure contributes directly to business performance, through the supply of production inputs (e.g. electricity and communication services, or transport of people and goods) and by facilitating market access. Good infrastructure improves the efficient use of inputs, enhances international market access, lowers trade costs and facilitates the flow of information.

Competitiveness endowments

Competitiveness endowments cover attributes that can affect national competitiveness but that are either fixed or cannot be changed except possibly in the very long term. This includes, for example, natural resources, geographical location and climate, and market size. These attributes can strongly influence both economic

structures and the environment in which enterprises operate, influencing their behaviour and, in turn, competitiveness outcomes.

While a country may have little scope to change its competitiveness endowments, they are nonetheless important to understanding and evaluating a country's competitive position and performance, since they can provide competitive advantages or place constraints on competitiveness performance.

3 Overview of the Cyprus economy

After joining the EU in 2004, and prior to the onset of the global financial and economic crisis in 2008, Cyprus' economy grew strongly. In relative terms, Cyprus weathered the global crisis well, as its banks had no toxic assets and did not depend on interbank funding. Consequently, the fall in GDP was less pronounced than in many other EU countries. Conversely, the economy was hard hit by the domestic fiscal and banking crisis in 2012-13. The crisis resulted in three years of negative growth and a 10 percent contraction of the economy. However, Cyprus' economy has recovered strongly from the banking crisis, returning to growth in 2015 and outstripping growth in the EU thereafter.

Service sectors dominate the economy of Cyprus. While Cyprus consistently runs a deficit in the trade of goods, this deficit is, to a large extent, compensated by a surplus in the trade of services. While headline figures indicate significant inward and outward FDI flows, some of these FDI flows are driven by special-purpose entities. Special-purpose entities are also a strong driver of trade in goods, accounting for between 33 and 45 percent of goods exports and between 17 and 30 percent of goods imports. They are far less significant for service exports, accounting for only about 6 to 10 percent of service exports and imports.

3.1 Economic structure

Structure and growth by economic sector

Service sectors dominate the economy of Cyprus. Market service sectors account for more that 60 percent of gross value-added (GVA) creation in the economy of Cyprus, with non-market services representing more than 20 percent. Similarly, services collectively account for over three-quarters of employment, with a further five percent of employed persons providing domestic services directly to households. The two largest sectors in terms of GVA are *Finance & insurance* and *Wholesale & retail distribution*. They are followed by *Real estate activities*[3], which represents around 10 percent of GDP but only about 0.6 percent of employment. By contrast, *Agriculture*, *Mining*, *Construction* and *Manufacturing* together represent less than 13 percent of GVA and under 20 percent of employment. (Figure 2)

In terms of employment, the largest sectors are consumer and tourist-oriented market services (e.g. *Wholesale & retail distribution* and *Accommodation & food service*'), and 'public' services (i.e. *Public administration*). *Education* and *Health & Social services*, for which there is significant private provision in Cyprus, collectively account for 12 percent of employment.

Sectors such as *Financial & insurance* services, *Information & communication*, and *Professional services,* together with *Real estate activities*, account for a higher share of total value-added than their corresponding share of employment, indicating that these sectors enjoy relatively high levels of labour productivity compared to the average for the whole economy.

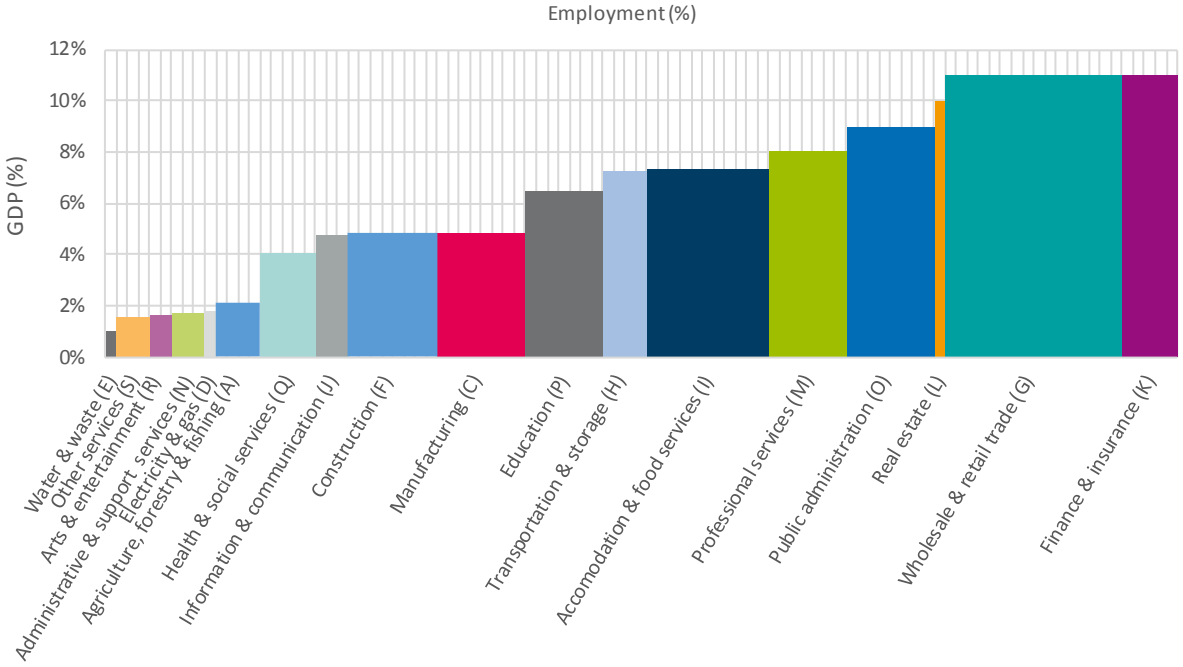
The development of the economy over the past decade has tended to reinforce the preeminent position of services in the economy. *Construction* and, to a lesser extent, *Manufacturing* contracted sharply following the 2008 global financial crisis and the later 2012-13 banking and fiscal crisis. Despite strong growth in the most recent years, neither sector has yet regained the losses in (real) value added and employment sustained during the crises. Sectors with a strong

[3] *Real estate activities* cover activities related to the selling or buying and renting real estate, including related activities (e.g. appraising real estate). In national accounts the value of real estate activities also includes imputed rents of owner-occupied dwellings. The development of building projects for buildings (or civil engineering works) is not included under *Real estate activities* but is part of *Construction*.

dependence on consumer spending, such as *Wholesale and retail trade* and *Other services*, followed a similar if less pronounced pattern over the past decade. (Figure 3 and Figure 4)

Financial and insurance services, which account for around 11 percent of GVA and 5 percent of employment, have traditionally played an important role in the economy of Cyprus. Over the past decade, however, the expansion of other business and professional services—such as *Information & communication services*, *Professional, services* and *Administrative & support services*—have reinforced the services-orientated general economic model of Cyprus, while *Education* and *Health & social services* are of increasing importance. A boom in tourism over the past two years has underpinned recent growth in value-added and employment in accommodation and food services.

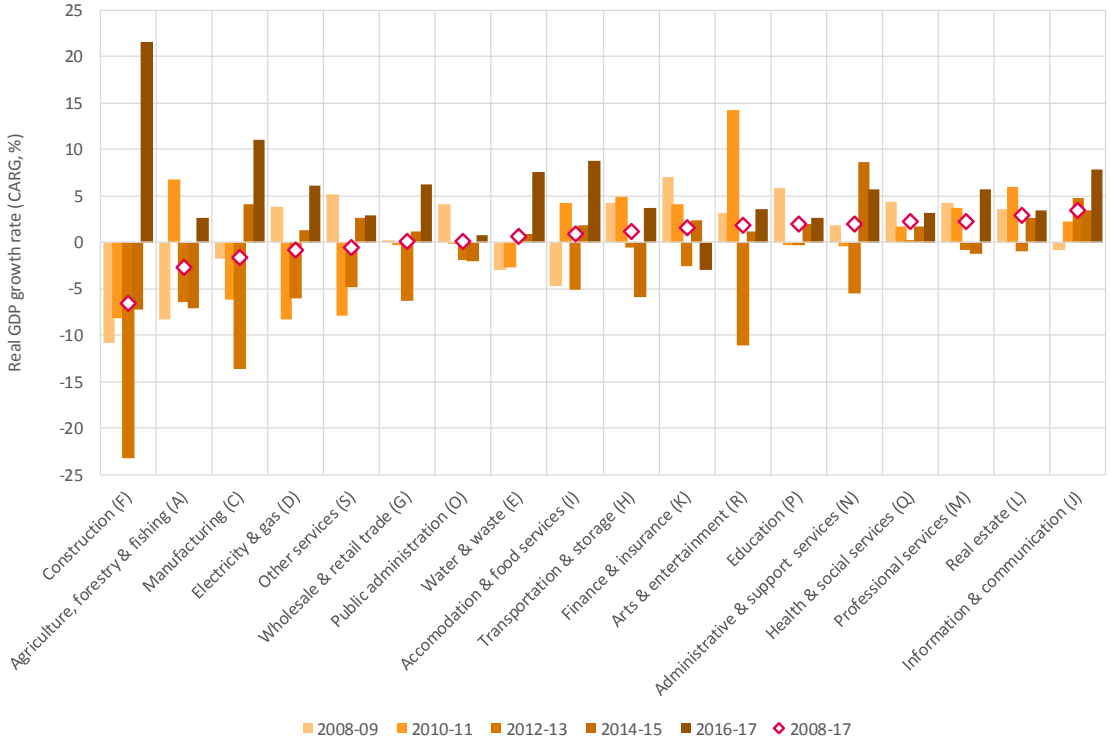
Figure 2 Cyprus economic structure, 2017



Notes: Column height represents the sector share of total value added. The column width represents the sector share of total employment. Letters in parenthesis are NACE Rev. 2 section codes. The mining sector is not included as its value added for 2017 was 0.12 percent of GDP.

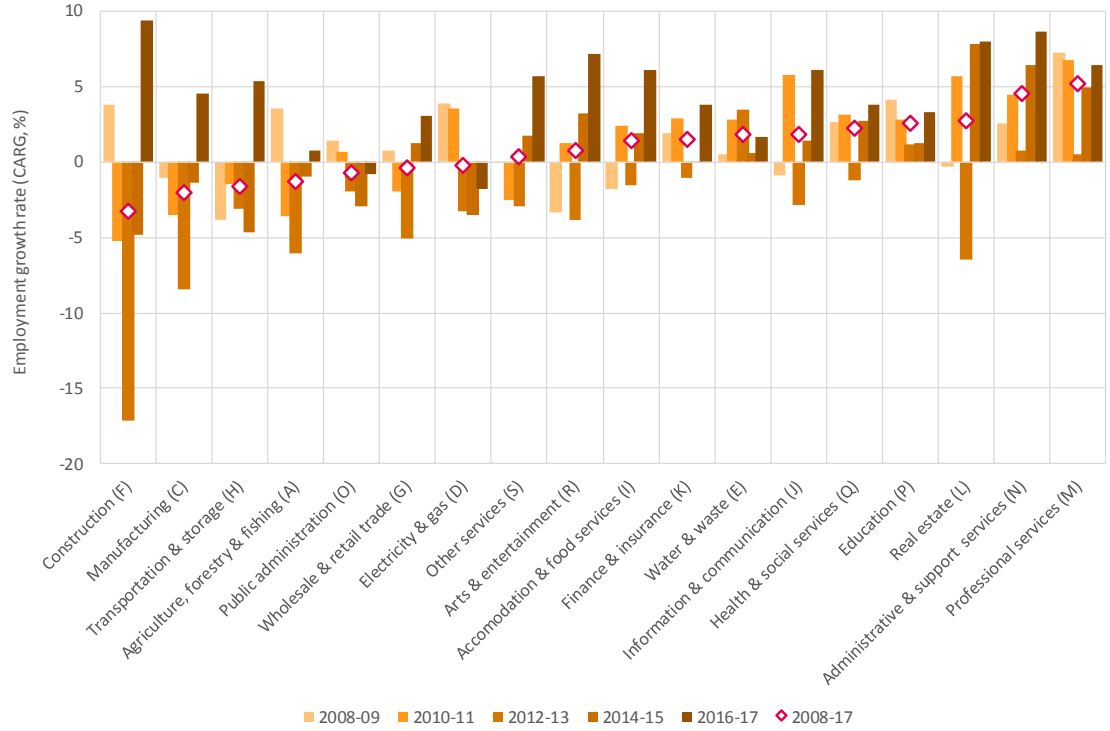
Source CYSTAT, National Accounts.

Figure 3 Development of real GDP by economic activity: selected sectors, 2008-2017



Notes: Compound annual rate of growth (CARG). Letters in parenthesis are NACE Rev. 2 section codes. Excludes 'Mining and quarrying (B)' and 'Activities of households as employers (T)'.
Source: CYSTAT, National Accounts: Gross Domestic Product at constant market prices 2010 (chain linking method).

Figure 4 Development of employment by economic activity: selected sectors, 2008-2017



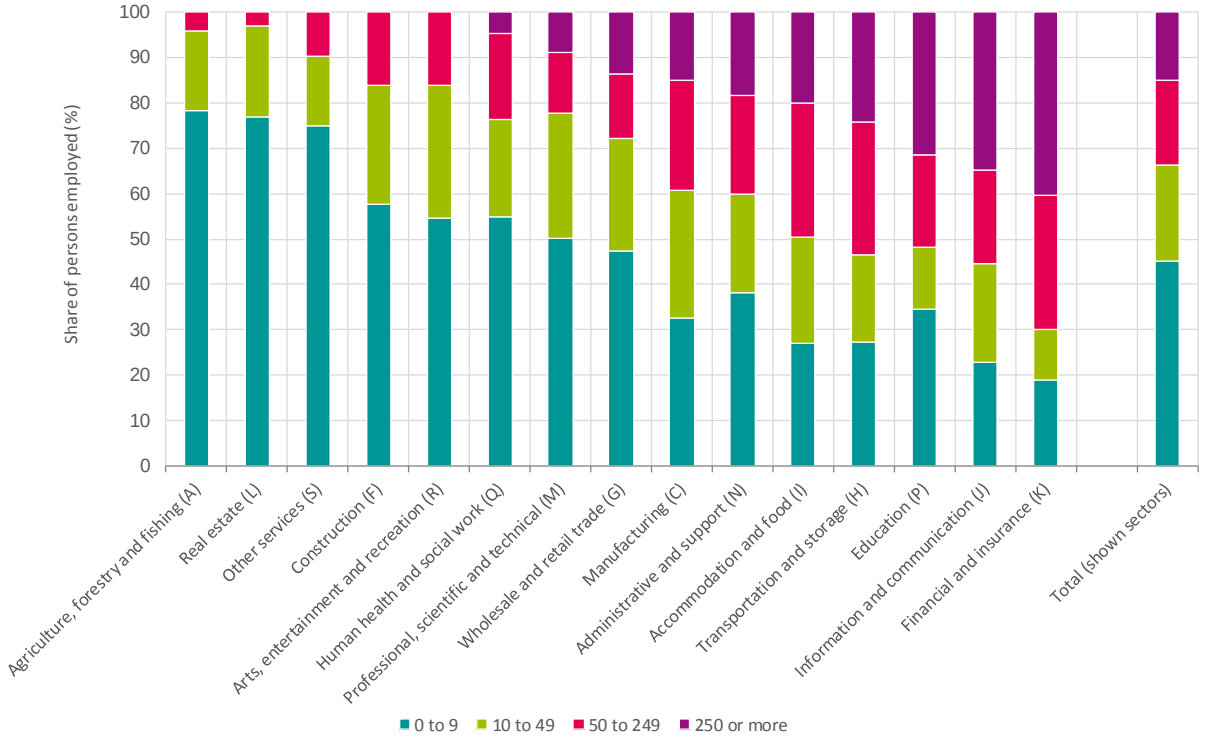
Notes: Compound annual rate of growth (CARG). Letters in parenthesis are NACE Rev. 2 section codes. Excludes 'Mining and quarrying (B)' and 'Activities of households as employers (T)'
Source: CYSTAT, National Accounts: Persons employed.

Structure by firm size

Of the more than 50,000 enterprises in the non-financial business economy, around 95 percent have less than 10 employees. Conversely, enterprises with 250 or more employees account for only 0.1 percent of all enterprises in Cyprus. Outside of public administrations, education and health, there are only 75 enterprises in Cyprus with 250 or more employees, of which nearly half are either in wholesale and retail trade or accommodation and food service activities.

Small and medium-sized enterprises (SMEs), defined as enterprises with less than 250 employees, account for nearly 85 percent of employment in the business economy or around three quarters of employment in the whole economy (i.e. including public administration and non-business sectors such as education and health). The share of employment in large enterprises (250 or more employees) is higher in business sectors such as financial and insurance activities, information and communication technology, and transport and storage, while construction has no large enterprises. Such enterprises account for only 15 percent of employment in manufacturing. (Figure 5)

Figure 5 Employment by economic activity and enterprise size (employees) for selected sectors, 2016



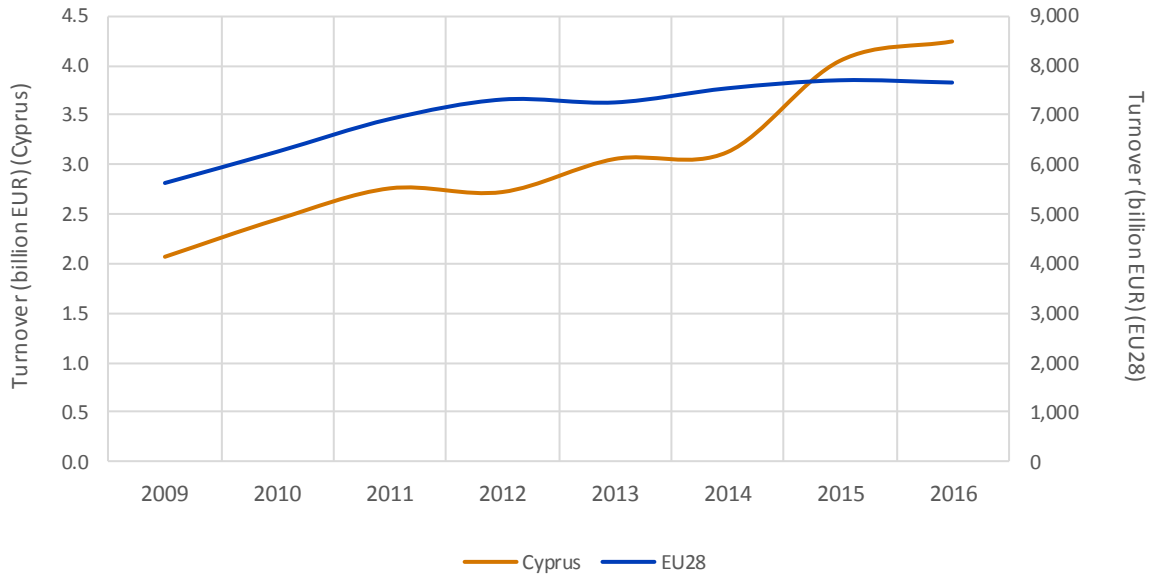
Source: CYSTAT, Business Register: Employment of enterprises by economic activity (NACE Rev. 2) and size group.

Foreign controlled enterprises

Eurostat data indicate that 300 enterprises are foreign-controlled in Cyprus, although these data do not cover some key sectors—e.g. water supply, financial activities and real estate—likely to be attractive for foreign enterprises. The turnover of foreign-controlled enterprises has increased steadily since 2009, suggesting a degree of resilience among the foreign controlled enterprises that remained in Cyprus. (Figure 6)

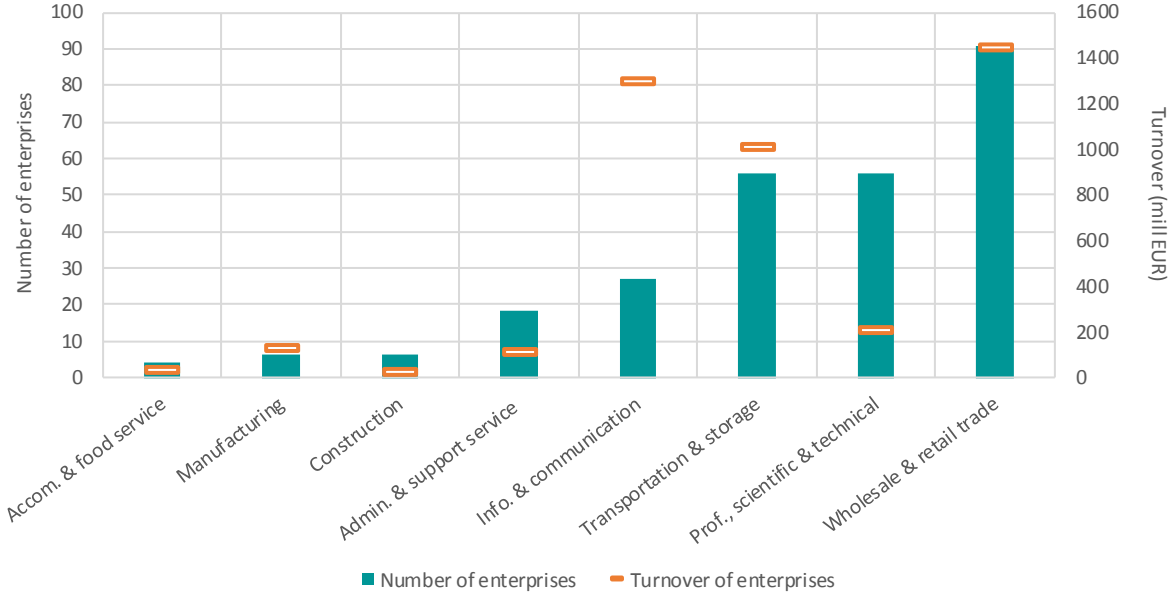
In terms of the sectoral distribution of foreign controlled enterprises, *Wholesale & retail trade*, *Professional, scientific and technical services*, and *Transportation & storage* dominate. In terms of turnover, *Professional, scientific and technical* and *Information & communication* services are important. (Figure 7)

Figure 6 Turnover of foreign-controlled enterprises, 2009-2016



Source: Eurostat, Foreign control of enterprises by economic activity and a selection of controlling countries [fats_g1a_08].

Figure 7 Foreign controlled enterprises in Cyprus by sector, 2016



Notes: Eurostat information missing for the NACE sectors Water Supply, Financial Activities, and Real Estate. Data on number of enterprises and turnover in the Construction category are for 2012. Data on number of enterprises and turnover in the Accommodation and Food Service category are for 2013.

Source: Eurostat, Foreign control of enterprises by economic activity and a selection of controlling countries [fats_g1a_08].

3.2 Economic Developments

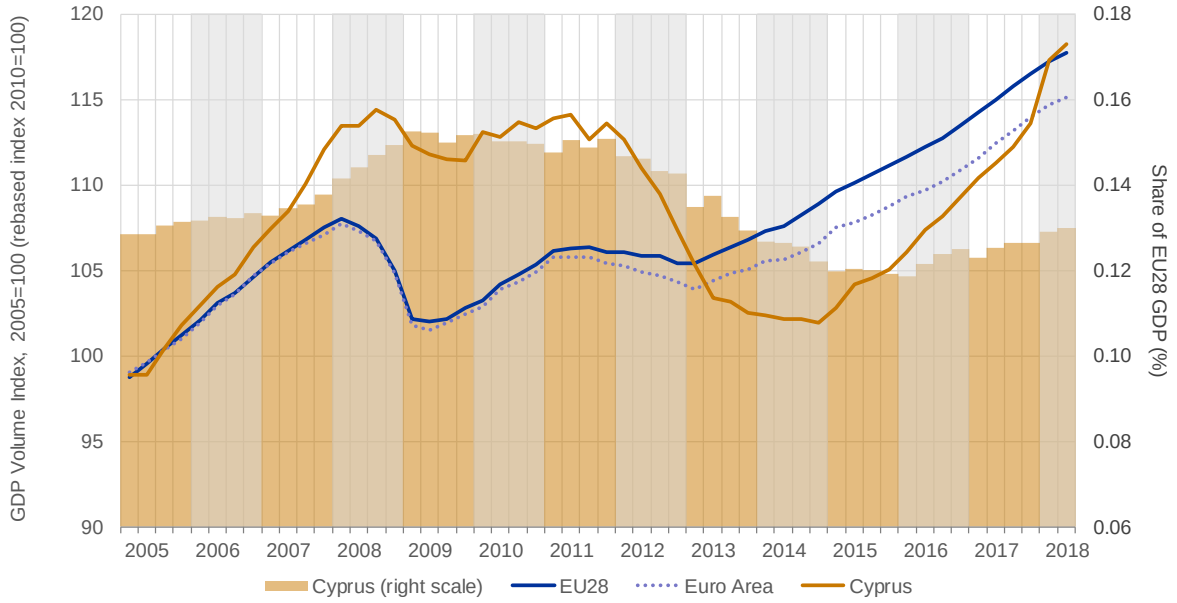
The global financial and economic crisis and the domestic fiscal and banking crisis in 2012-13 have strongly influenced the development of Cyprus' economy over the last decade. Nonetheless, the economy has proven to be resilient, with a strong recovery appearing to gather pace over the past two years. The recovery is broad based, with private consumption, fixed-capital investments—especially in machinery and equipment—and strong exports of services being the main drivers. The employment rate is close to the Eurozone average and unemployment has fallen consistently over the past three years to reach around 7.5 percent by the third quarter of 2018.

GDP level and growth

After joining the EU in 2004 and prior to the onset of the global financial and economic crisis in 2008, Cyprus' economy grew strongly. In relative terms, Cyprus weathered the global crisis well, as its banks had no toxic assets and did not depend on interbank funding. Consequently, with a fall in GDP that was less pronounced than in many other EU countries, Cyprus' share of overall EU GDP increased from around 0.13 percent in 2005 to around 0.15 percent from 2009 to 2011. Conversely, the economy was hard hit by the domestic fiscal and banking crisis in 2012-13.

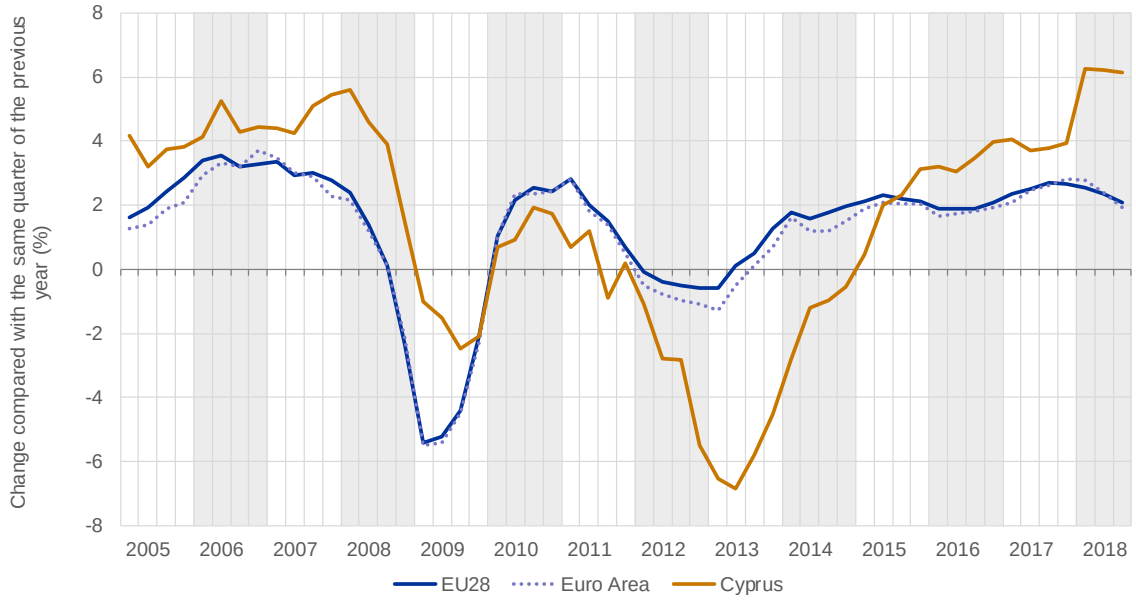
The crisis resulted in three years of negative growth and a 10 percent contraction of the economy between the fourth quarter of 2011 and the fourth quarter of 2014. However, Cyprus' economy has recovered strongly from the banking crisis, returning to growth in 2015 and outstripping growth for the whole EU thereafter. Cyprus' achieved 4.8 percent GDP growth in 2016 and 4.2 percent in 2017, enabling real GDP to recover to near pre-crisis levels by the end of 2017 and move beyond it in 2018. (Figure 8 and Figure 9)

Figure 8 Real gross domestic product and Cyprus' share of EU28 gross domestic product, 2005-2018



Notes: Quarterly data for 2018 up to 2018Q2.
Source: Eurostat, Quarterly National Accounts: Gross domestic product, chain linked volumes (index 2010=100), seasonally and calendar adjusted data [namq_10_gdp].

Figure 9 Growth rate of real gross domestic product, 2005-2018



Notes: Data for 2018 up to 2018Q3.
Source: Eurostat, Quarterly National Accounts: Gross domestic product, chain linked volumes (index 2010=100), seasonally and calendar adjusted data [namq_10_gdp].

Decomposition of GDP growth

Both the dip in growth in 2009 due to the global financial crisis and the more substantial contraction that came with the domestic fiscal and banking crisis saw significant falls in private consumption and investment. Furthermore, public consumption also negatively contributed to growth between 2012 and 2015. A recovery in investment and strong real private consumption growth have been the main contributors to the recovery since 2015. (Figure 10)

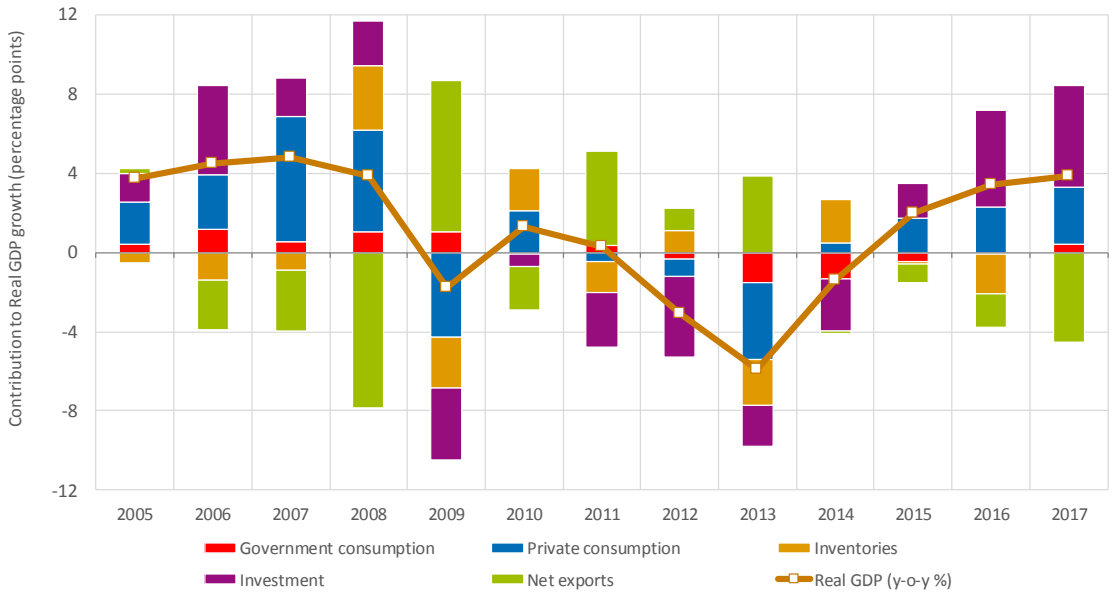
Decomposing growth by the contributions of different factors of production—labour and capital inputs—and total factor productivity (see Box) show a strong decline in the quantity of labour from 2012 to 2014. This reflects the contraction of employment following the onset of the crisis. The data also show a very limited contribution of ICT capital to growth throughout the period, while 2015 is the only year in which total factor productivity growth has positively contributed to GDP since 2006. (Figure 11)

Although the data suggest some recent stabilisation of total factor productivity following a long decline, current investment patterns do not appear favourable for future productivity gains. Recent increases in fixed investment (see Figure 19) have been driven by the construction of dwellings, while gains in machinery and equipment investments are partially attributable to ship registrations—which were particularly important in 2016 and 2017—that are equally unlikely to feed through to improved productivity growth. Meanwhile, despite some signs of recent improvement, investments in ICT and other machinery and equipment remain well below their pre-crisis levels (see Figure 20)

Definition: Total Factor Productivity

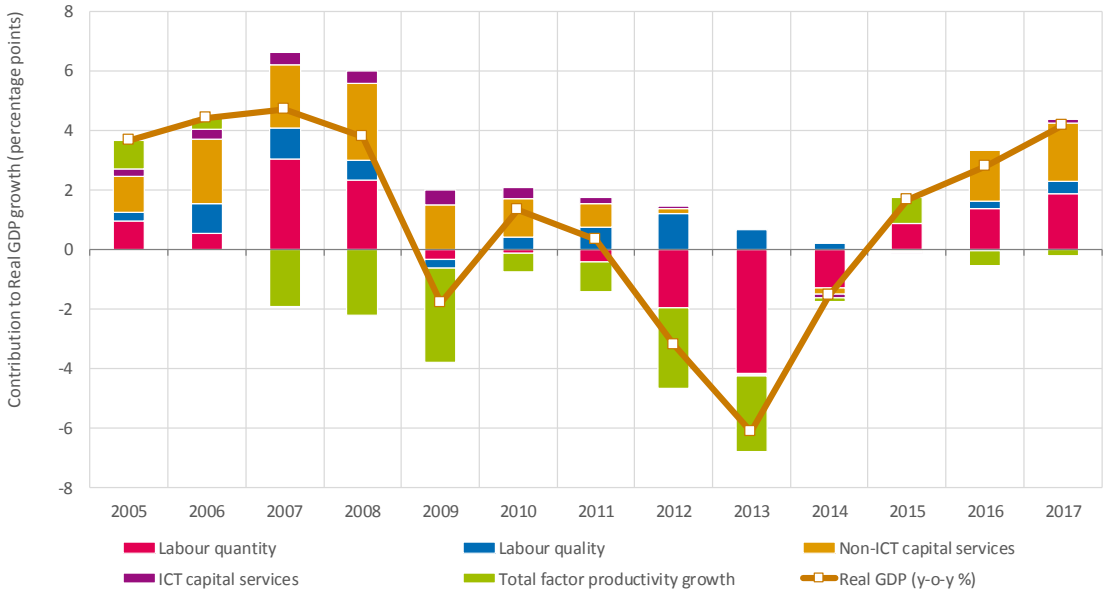
Total Factor Productivity (TFP), alternatively referred to as Multifactor Productivity, is the residual change in output not directly due to labour and capital inputs. TFP is often interpreted as the effect of technological change, efficiency improvements, innovation, and other non-measured contributions to output.

Figure 10 Contribution to growth of real gross domestic product, 2005-2017



Source: CYSTAT, National Accounts.

Figure 11 Decomposition of GDP growth, 2005-2017

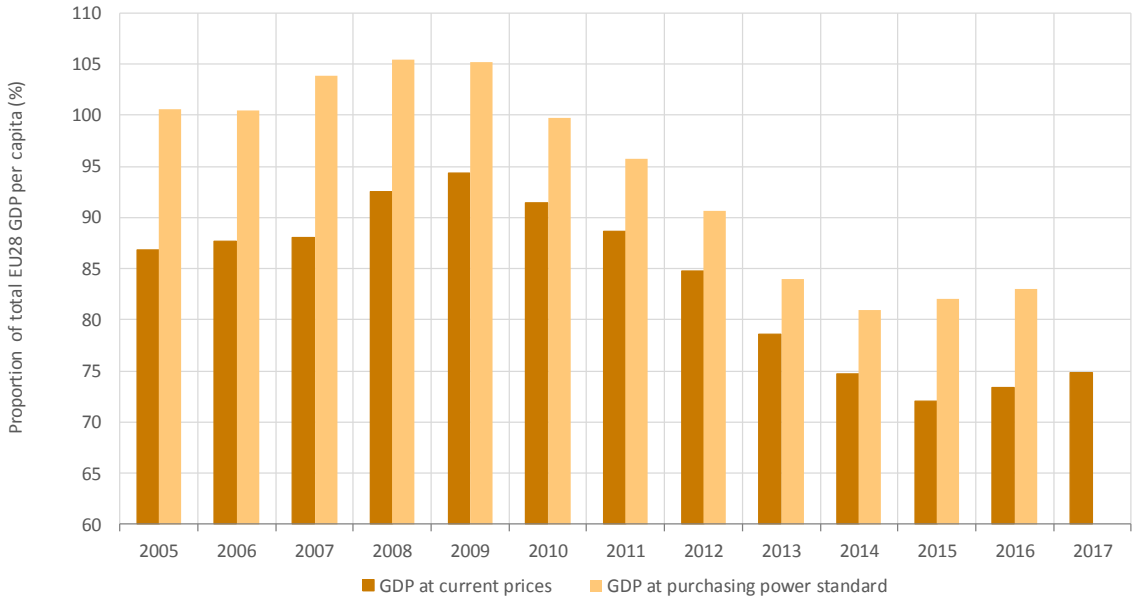


Source: Conference Board, Growth of Total Factor Productivity.

GDP per capita

Measured at current prices, GDP per capita in Cyprus increased from 87 percent to 94 percent of the EU average between 2005 and 2009, sliding back to 72 percent in 2015, with modest improvements seen in 2016 and 2017. Adjusting for price level differences between countries using the purchasing power standard (PPS) measure of GDP enhances Cyprus' relative position. Using this measure, Cyprus' GDP per capita reached 105 percent of the EU average in 2009 before falling to 80 percent in 2014, after which it has risen slowly to 85 percent in 2017. (Figure 12)

Figure 12 Gross domestic product per capita, 2005-2017

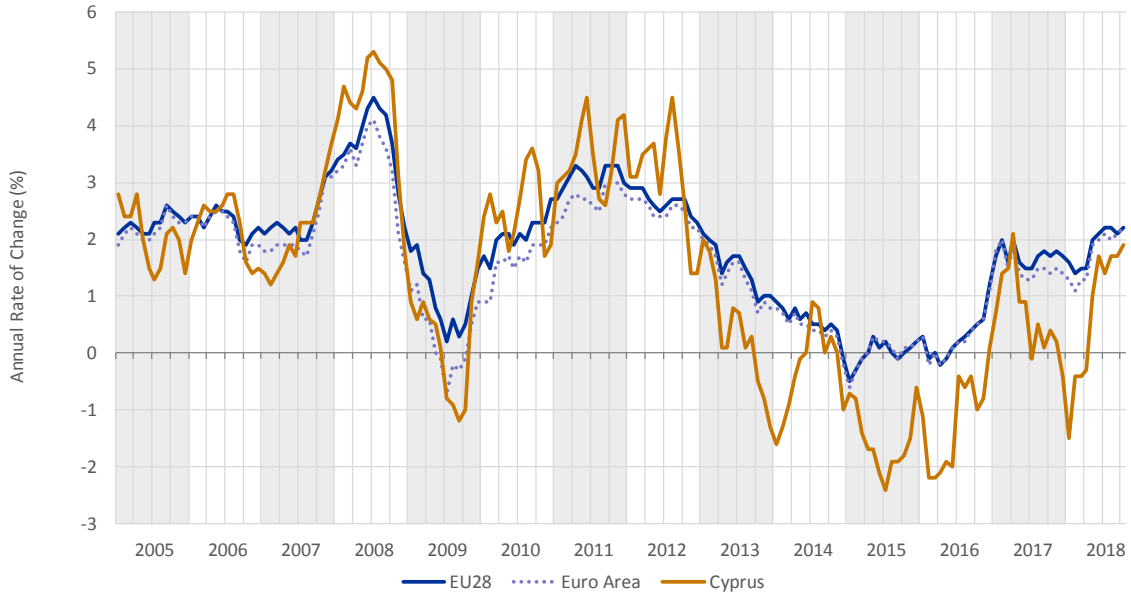


Source: Eurostat, Annual National Accounts: Gross domestic product at market prices. [nama_10_pc]

Inflation

Inflation in Cyprus, as measured by the harmonised index of consumer prices (HICP), has broadly followed the evolution observed in the EU as a whole, at least prior to 2013. Since 2013, the inflation rate has fallen below the EU and the Eurozone average and was negative throughout 2015 and 2016, in large part due to declining energy prices. Inflation increased in the first half of 2017, driven by increases in energy prices and transport costs, but was only around 0.7 percent for the year, less than half the rate for the whole EU and for the Eurozone. (Figure 13)

Figure 13 Inflation (HICP), 2005-2018

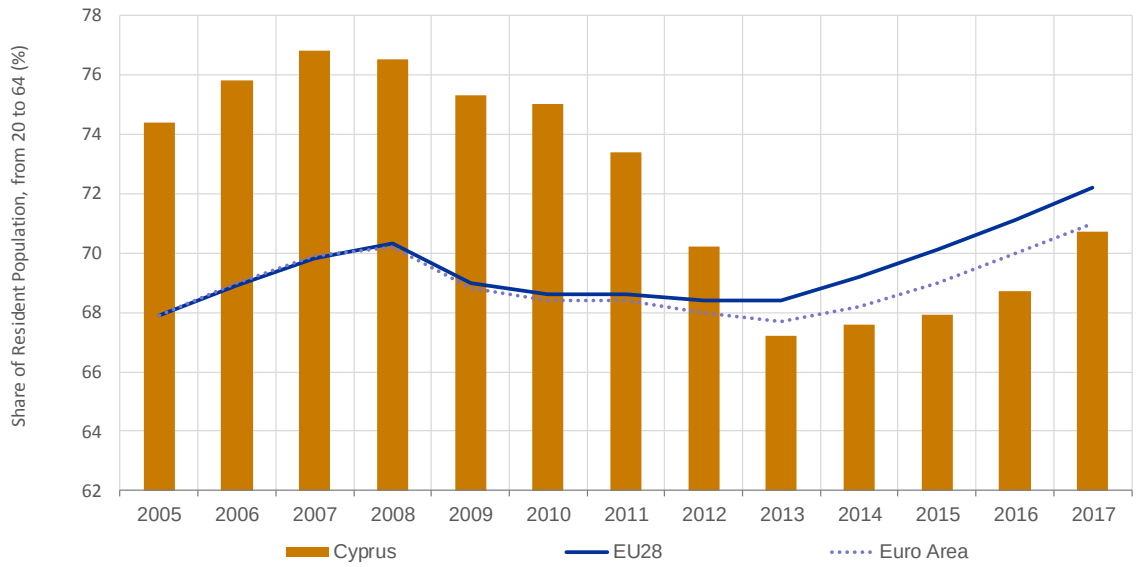


Notes: Data for 2018 up to October 2018.
Source: Eurostat, HICP: Monthly data (annual rate of change), index 2015 = 100 [prc_hicp_manr].

Employment and unemployment

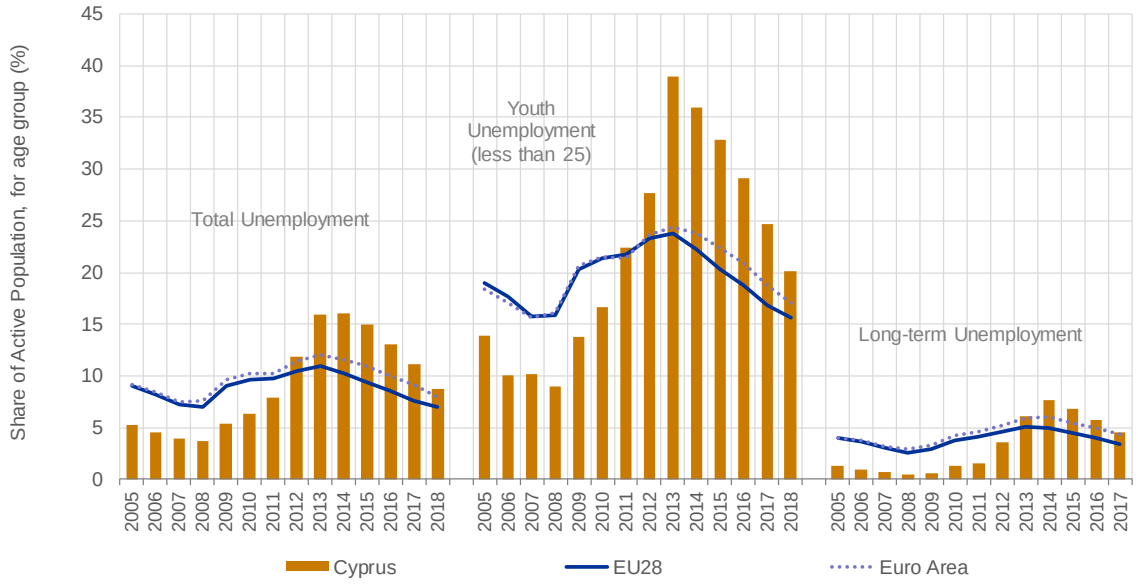
Having fallen below the EU average in 2013, the employment rate in Cyprus has improved rapidly over the past couple of years to reach 71 percent in 2017, though it still remains below the peak of 77 percent in 2007. (Figure 14) Unemployment, which had risen sharply from below 4 percent in 2008 to 16 percent in 2014, has declined over the past three years, to only 7.6 percent in the last quarter of 2018. Youth unemployment rose dramatically during the crisis period, from 9 percent in 2008 to nearly 40 percent in 2013, before falling to around one quarter in 2017. The long-term unemployment rate (4.5 percent in 2017) is only marginally above the Eurozone average, and has fallen significantly since 2014. (Figure 15)

Figure 14 Employment rate, 2005-2017



Source: Eurostat, Labour Force Survey: Total employment (resident population concept - LFS. [lfsi_emp_a].

Figure 15 Unemployment rate, 2005-2018

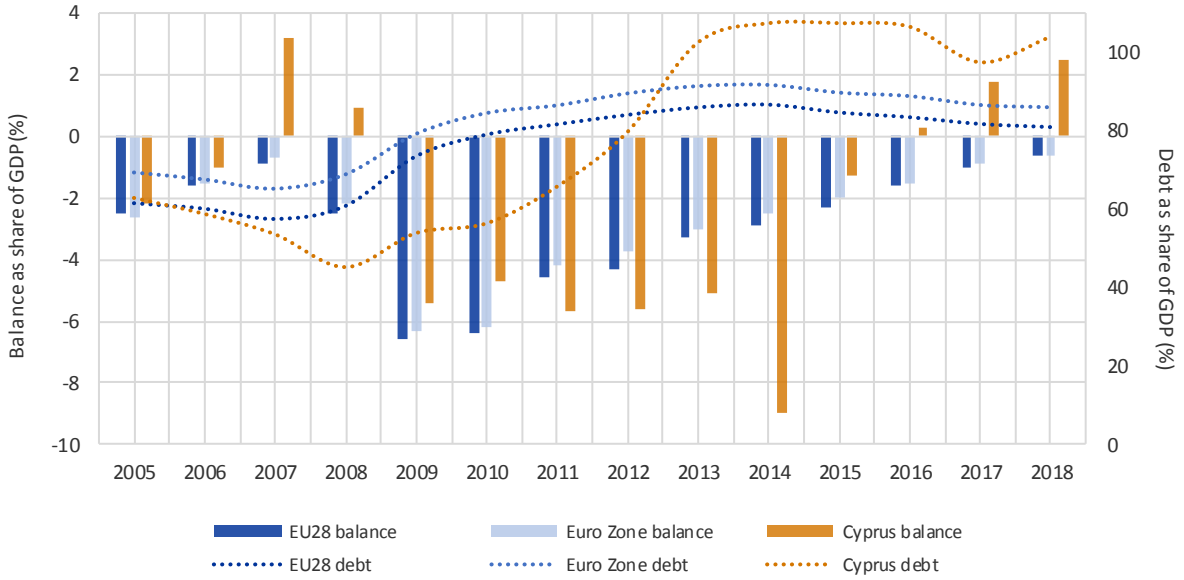


Source: Eurostat, Labour Force Survey: Unemployment [une_rt_a and une_ltu_a].

Public finances

From 2011 to 2014, the government deficit of Cyprus as a share of GDP exceeded the EU average, increasing to almost 9 percent in 2014 as the economy contracted on the back of the fiscal and banking crisis and with the State providing €1.5 billion of capital injections to cover losses of the Cooperative Central Bank and its subsidiaries. Since then, the deficit has been greatly reduced, with the government running a surplus in 2016 and 2017. This improvement reflects an impressive recovery in the economy combined with fiscal consolidation measures. Public debt levels in Cyprus were significantly below the EU average before the fiscal and banking crisis. During and after the crisis they rose above the EU average and, although falling in 2017, are still above the Stability and Growth Pact threshold of 60 percent. (Figure 16)

Figure 16 Government balance and debt, 2008-2017

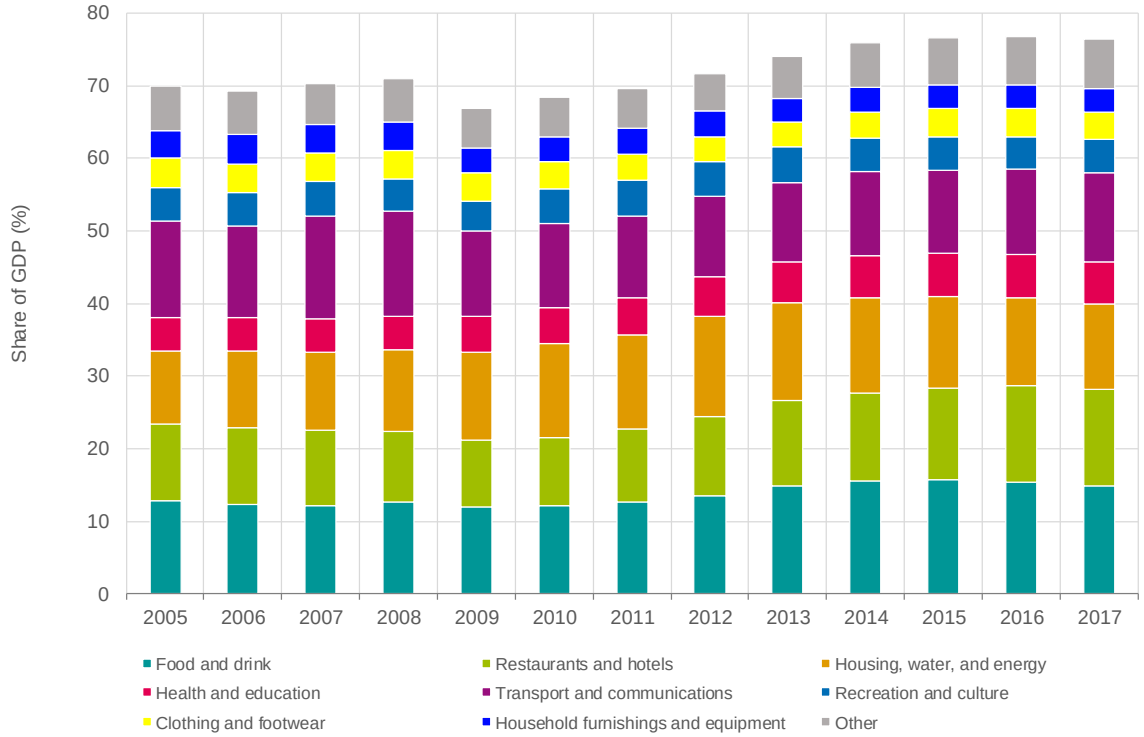


Notes: Year-to-year balance on the left axis; cumulative debt on the right axis. Data excludes the one-off effect of the partial sale of the assets and liabilities of the Cyprus Cooperative Bank (CCB).
Source: Eurostat, Government deficit/surplus, debt and associated data [gov_10dd_edpt1].

Private consumption

Cyprus has the highest ratio of household expenditure to GDP among EU Member States; 77.2 percent in 2017 compared to an EU average of 54.6 percent. The ratio of household expenditure to total GDP increased between 2009 and 2014 with more spending on food and drink, hotels and restaurants, housing and utilities, and health and education. (Figure 17) Private consumption has since remained constant.

Figure 17 Final consumption expenditure of households by consumption purpose, 2005-2017



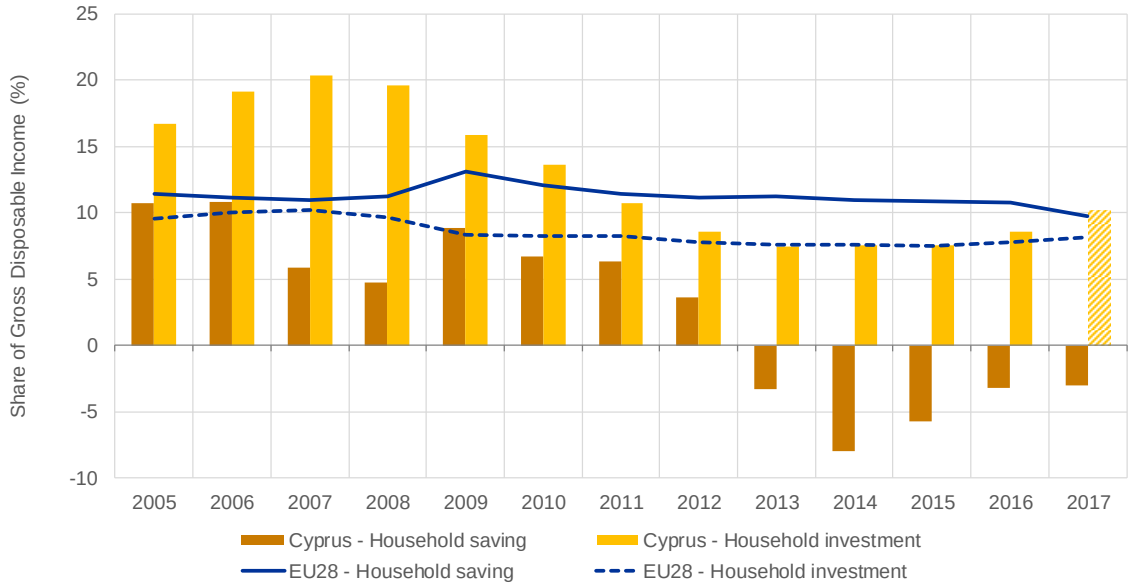
Source: Eurostat, National Accounts: Final consumption expenditure of households by consumption purpose [nama_10_co3_p3].

Household saving and investment

Recent growth in private consumption has been stimulated by high levels of consumer confidence, improving wages and rising employment, while households have been running down accumulated savings to finance consumption, resulting in negative household savings rates. The negative savings rates have been improving over the past four years, after reaching a low of around 7.5 percent in 2014. However, a continuation of negative saving rates in the future could be a potential cause of concern, if it leads to unsustainable accumulation of household debt.

The rate of household investment (mostly of purchases and renovation of dwellings), which had reached over 20 percent in 2007, fell to a level close to the EU average of around 7.5 percent between 2013 and 2015. (Figure 18)

Figure 18 Household saving and investment rates, 2005-2017



Notes: Gross disposable income adjusted for the change in the net equity of households in pension funds reserves. Value of Cyprus - Household investment for 2017 is provisional at the time of publication.
Source: Eurostat, Annual Sector Accounts: Saving of households and non-profit institutions serving households and Gross fixed capital formation of households and non-profit institutions serving households [nasa_10_ki].

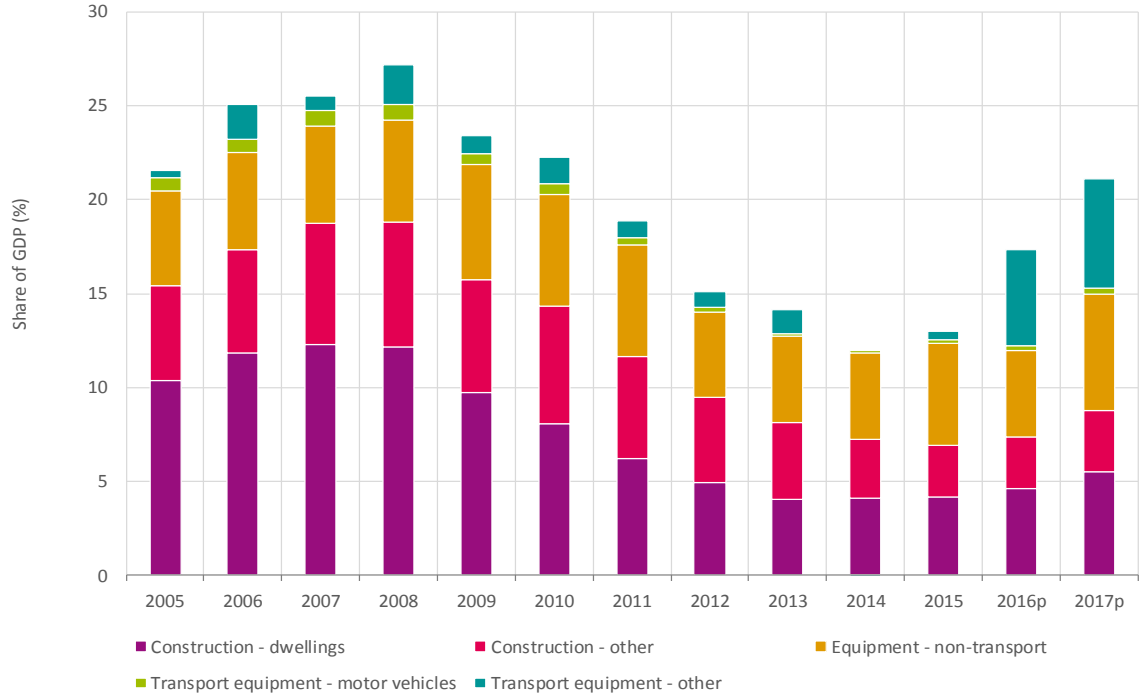
Fixed Investment

Between 2009 and 2014, investment activity negatively contributed to growth but has recovered strongly since 2015, rising from 11.7 percent of GDP in 2014 to 21.1 percent in 2017. Although below its peak of 2007-08, construction investment in the past two years has been boosted by tourism-related demand combined with a recovery in the residential real-estate market, mainly driven by foreign demand. The main contribution to growth has, however, come through investments in equipment, particularly the category *Transport equipment*, which includes ships (and aircraft) that are understood to have contributed significantly to the major boost in investment in 2016 and 2017. (Figure 19).

Investment in ICT equipment contracted sharply between 2010 and 2014. It has stabilised since 2014, but remains at 40 percent of the peak level achieved in 2009-10. This compares with steady growth in ICT investment for the whole EU, which by 2017 was nearly 30 percent above its level in 2010. The decline in Cyprus' investment in other machinery and equipment (excluding transport) was less marked and has recently shown signs of recovery, though in 2017 it was still more than a quarter below its 2010 level. (Figure 20) Low investment in ICT and other productive capital that could be expected to drive productivity growth should be a concern.

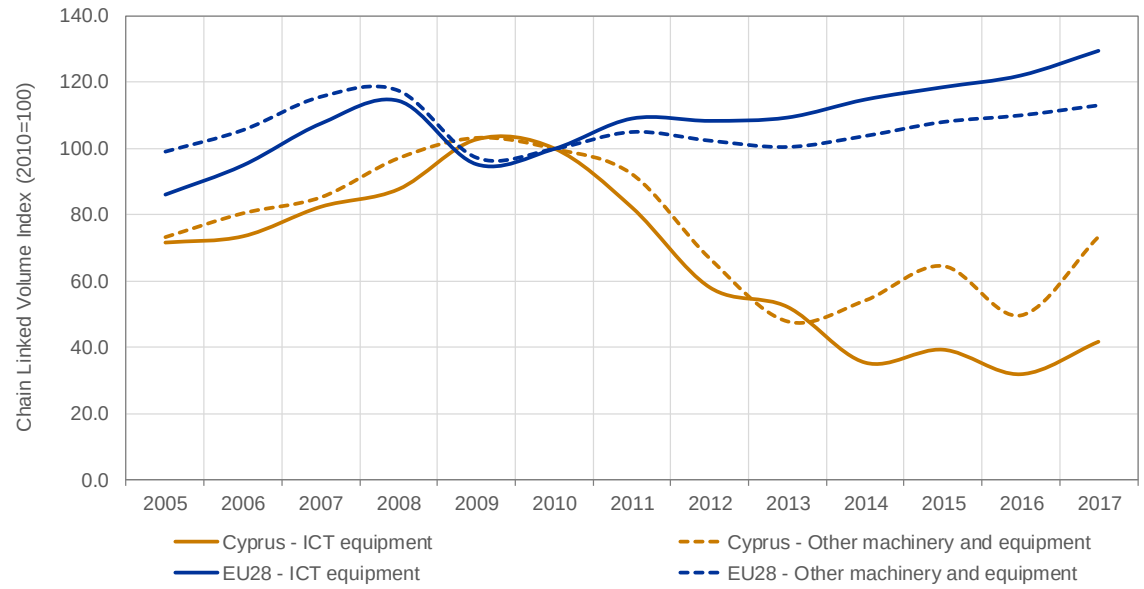
Note: Recorded fixed investments include acquisitions by Special Purpose Entities (SPEs). The majority of SPEs in Cyprus are holding companies, but they also include non-financial companies, which are mainly used by shipping companies to register ships. Separate data for fixed investments made by SPEs are not available, but the Central Bank of Cyprus has published data on the net international investment positions of SPEs in Cyprus. These data are described Section 3.3.

Figure 19 Investment (gross fixed capital formation) by type, 2005-2017



Notes: 'Equipment – non-transport' covers the category 'Machinery and equipment and intangible fixed assets'.
Source: CYSTAT, National Accounts.

Figure 20 Equipment investment (gross fixed capital formation) by type, 2005-2017



Notes: 'Other machinery and equipment' covers the category 'Other machinery and equipment and weapons systems' and excludes transport equipment.
Source: Eurostat, National Accounts: *Gross fixed capital formation by AN_F6 asset type* [nama_10_an6].

Balance of Payments

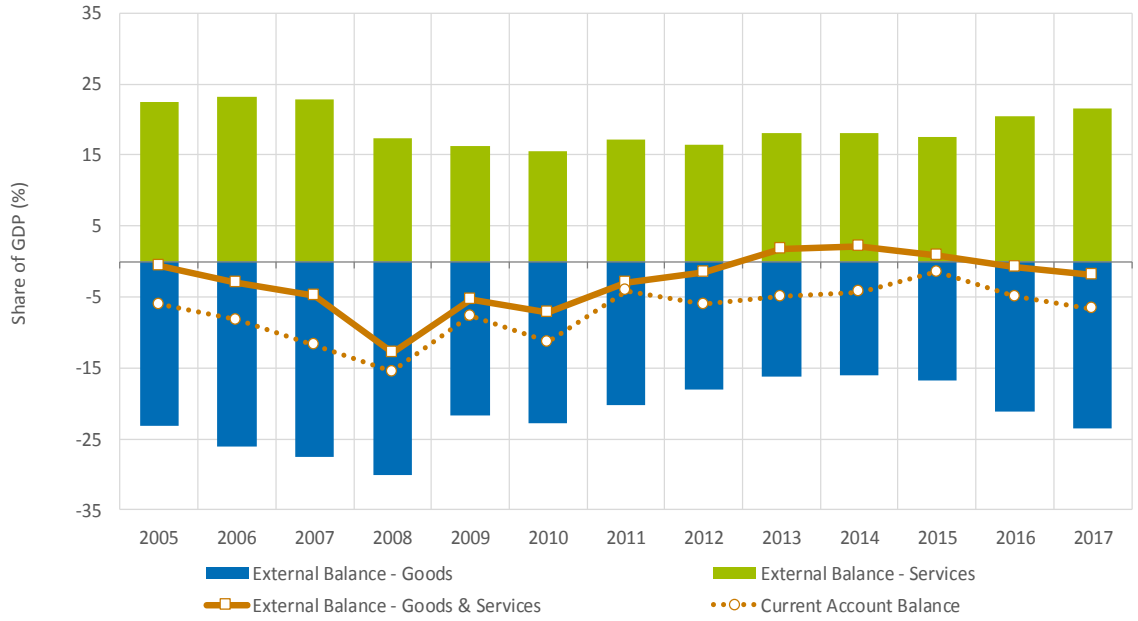
Cyprus consistently runs a deficit in the trade of goods which, to a large extent, is compensated by a surplus in the trade of services. The ratio of both goods and service exports to GDP has increased over time, quite dramatically so for service exports, increasing from 35 percent of GDP 2007 to more than 50 percent in 2017. This partly reflects the contraction of GDP in the aftermath of the crisis,

as service exports in absolute terms have increased moderately. Nevertheless, it indicates a high degree of resilience in Cyprus' service-orientated business model.

The ratio of the net balance of trade in goods and services to GDP had been deteriorating up to 2008, but the negative balance in goods shrank when demand for imports contracted with the global financial and economic crisis and the subsequent domestic banking crisis. The net balance was positive from 2013 to 2015 before turning negative again in 2016 and 2017 as the economic recovery drew in more imports. With the inclusion of net investment incomes and transfers—which is consistently negative throughout the period—the overall current balance has followed a similar evolution, although remaining negative. (Figure 21)

Note: There is a break in the series of external statistics for Cyprus in 2008 that, for the sake of consistency, should be considered. As from 2008, external statistics data are compiled in accordance with the IMF's Balance of Payments and International Investment Position Manual, 6th Edition (and the European System of Accounts, 2010). All publications and data releases prior to 2008 are, therefore, not comparable as they are based on the previous manual methodology. The most important change between the two periods is the treatment of SPEs. The published data prior to 2008 treated SPEs as non-residents while from 2008 onwards SPEs are treated as residents. Concerning shipowning, prior to 2008, current account statistics did not include transfer of ships whereas they were included in GDP (i.e. leasing fees charged by SPEs). Since 2008, SPEs are included in the current account. The economic transfer of transport equipment (e.g. registration or deregistration of ships) does not affect GDP but can have a large impact on external accounts, which can distort the analysis of investment and external trade. The Central Bank of Cyprus has published data on the impact of SPEs on Cyprus Balance of Payments. These data are described Section 3.3.

Figure 21 External balance (current account), 2005-2017

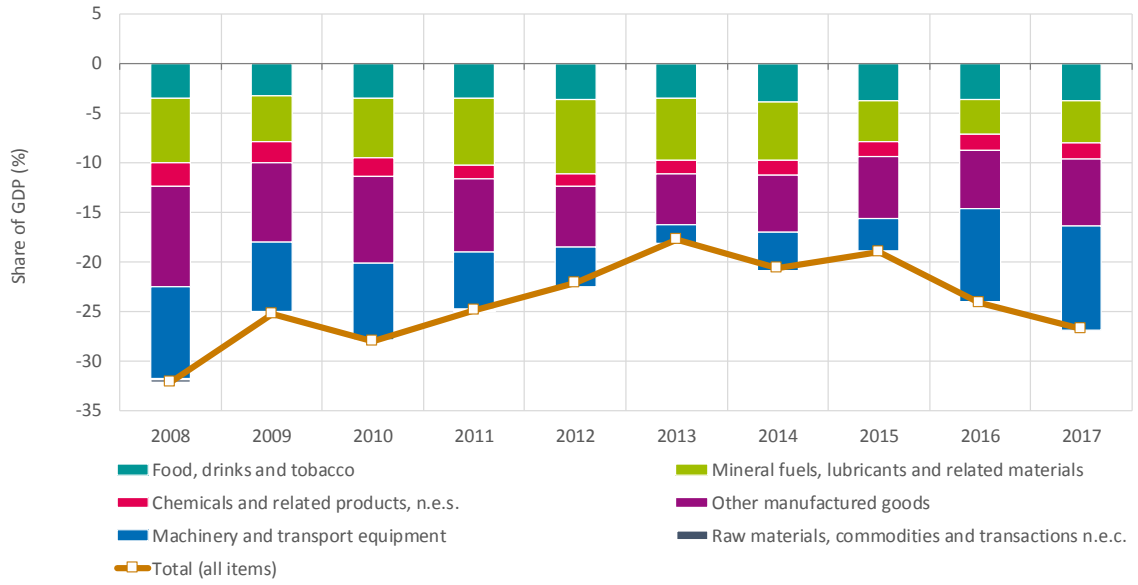


Source: Eurostat, GDP and main components [nama_10_gdp] and Balance of Payments [bop_gdp6_q]; Central Bank of Cyprus, Balance of Payments.

Goods trade balance

Cyprus consistently has a negative trade balance for all the main product groupings of trade in goods. The negative balance contracted between 2008 and 2013, particularly for *Machinery and transport equipment* and *Other manufactured goods*, which covers a wide range of products varying from clothing and footwear to professional and scientific equipment, and from paper and board to metals. Since 2015, the deficit in *Machinery and transport equipment* has increased rapidly, from €600 million to €2 billion, matching the strong boost in investment in equipment shown earlier. (Figure 22)

Figure 22 Balance of trade in goods, 2008-2017



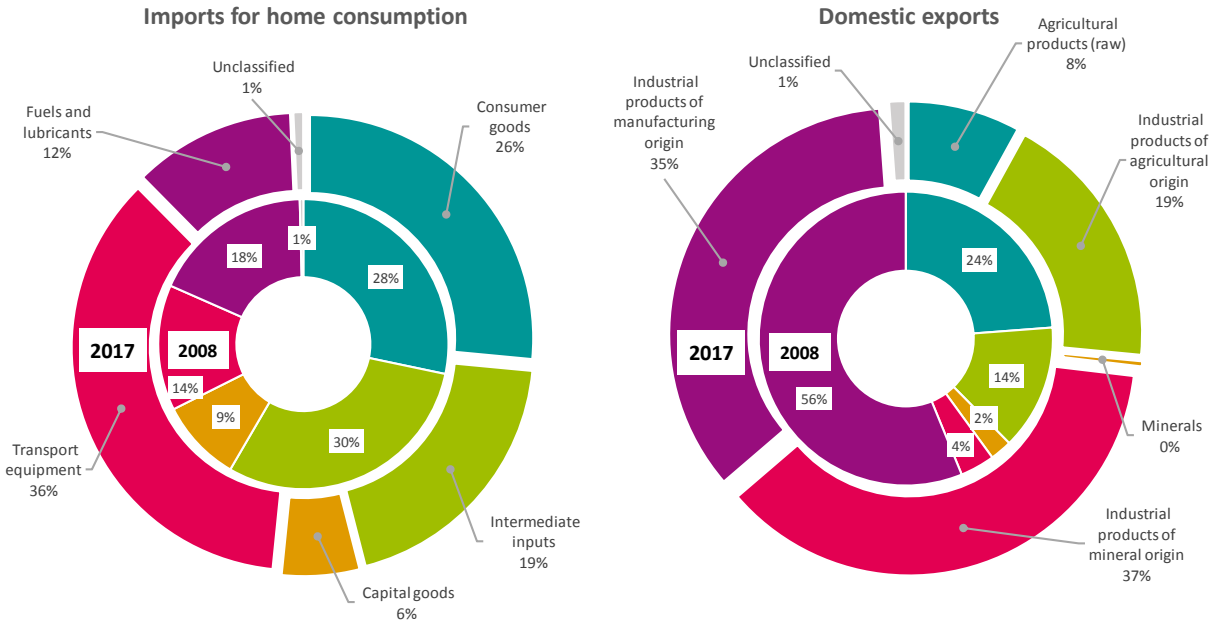
Source: Eurostat, International trade by Standard International Trade Classification product group [ext_lt_intertrd].

Composition of goods trade

In 2017, transport equipment accounted for over a third of imports categorised as for 'home consumption' in Cyprus, followed by consumer goods that stood for a further quarter of imports. Over two-thirds of transport equipment imports consisted of *Ships, boats and floating structures*, which may be largely attributable to transactions by Special Purpose Entities as opposed to imports strictly for domestic use. (Figure 23)

For exports, the largest category is *Industrial products of mineral origin*, which consist mostly of mineral fuels and oils and is most likely attributable to a new petroleum distribution terminal that opened in 2014. Pharmaceutical products dominate Cyprus' exports of non-food manufactured goods. The share of raw agricultural products in total domestic—mostly potatoes, citrus fruits and fish—has declined over recent years, but has been offset to some extent by an increase in the share of processed foods, notably halloumi cheese and fruit juices.

Figure 23 Imports and exports of goods by main economic category (share of total), 2008 and 2017



Notes Domestic exports cover goods originating in the economic territory of Cyprus that have been wholly obtained in it or were substantially transformed by processing in it, so that the processing confers domestic origin. Domestic exports exclude goods originally imported and having undergone only repair or minor operations (e.g. blending, packaging, bottling, cleaning, sorting, husking and selling) which leave them essentially unchanged. Also excluded are stores and provisions for ships and aircraft.

Source: CYSTAT, Foreign Trade by main economic category.

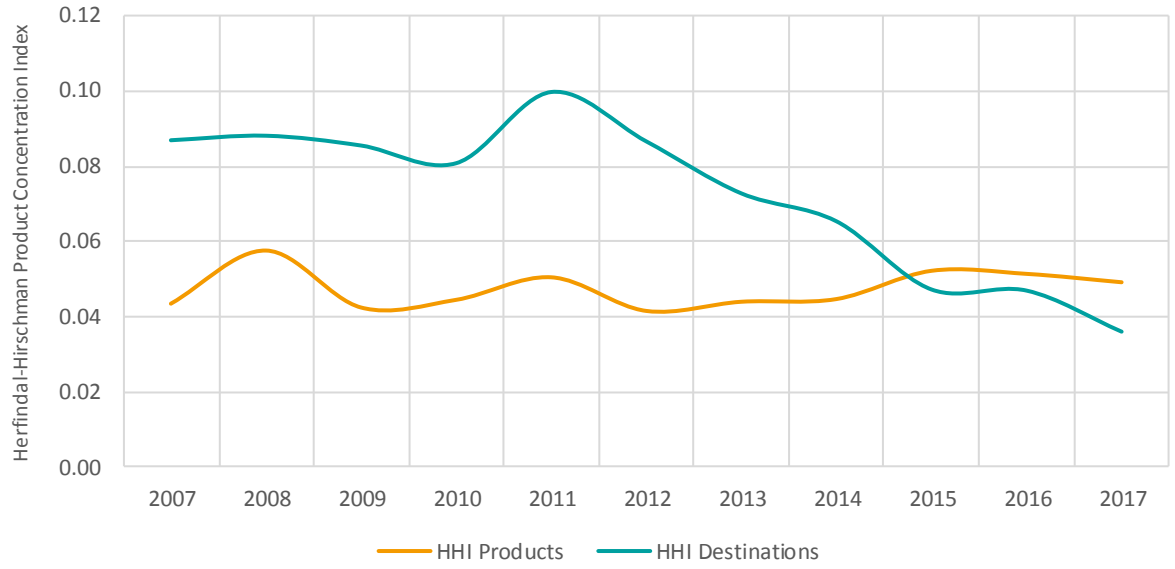
Diversification of goods trade

The level of product diversification of Cyprus' trade in goods by product has remained relatively steady since 2007, with only a small decrease during the 2012-13 banking crisis. This suggests that Cyprus has not significantly diversified its goods exports towards new, non-traditional products. In comparison, in terms of export destinations, diversification seems to have increased after the fiscal and banking crisis (reflected in a decline in the concentration index), suggesting that Cypriot exporters have sought out new markets for their products over recent years. (Figure 24)

Definition: Herfindahl-Hirschman Product Concentration Index

The Herfindahl-Hirschman Product Concentration Index is a measure of the dispersion of trade value across an exporter's products. The index ranges from 0 to 1, with a higher value indicating that trade is concentrated in fewer products, which may be interpreted as a greater potential vulnerability to trade shocks. Measured over time, a fall in the Index indicates increasing diversification in an exporter's trade profile and, hence, lower vulnerability.

Figure 24 Product concentration index, 2007-2017

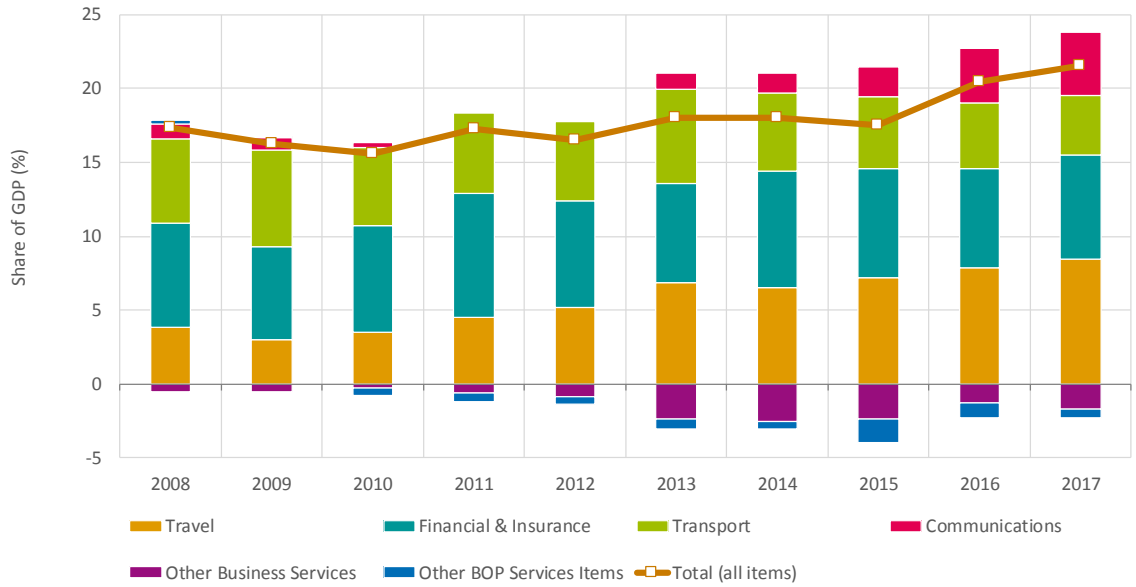


Source: World Bank, World Integrated Trade Solutions: Herfindahl-Hirschman Product Concentration Index (Export diversification).

Services trade balance

Historically, the main contributors to Cyprus' trade surplus in services are travel (mostly tourism), financial services and transport (mostly shipping). Since 2013, alongside a strong performance from the tourism sector, Cyprus has seen a rapid expansion in exports of communication services, overwhelmingly coming from exports of computer services. The net balance for communication services increased from €24.4 million in 2012 to €822.7 million in 2017, equivalent to 4.3 per-cent of GDP. (Figure 25)

Figure 25 Balance of trade in services, 2008-2017

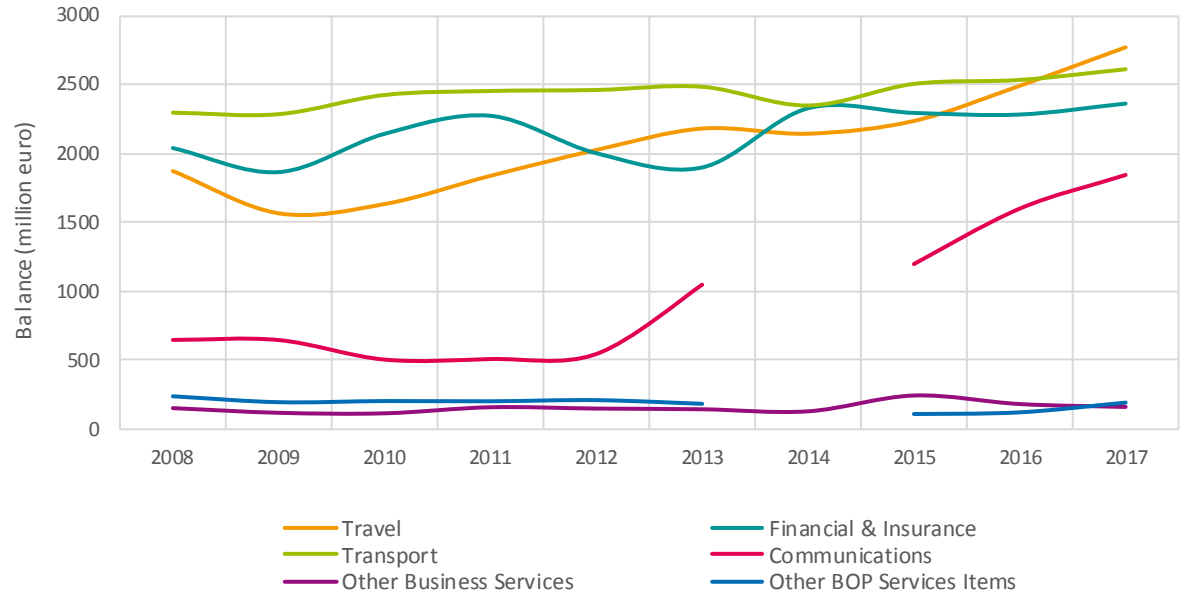


Source: Central Bank of Cyprus, Balance of Payments.

Composition of service exports

Service sector exports are substantial, with a particular focus on transport, travel, financial services, and communications (ICT) services. Tourism ('travel') exports have expanded significantly since 2010. Conversely, exports of financial services contracted during and after the banking crisis but have since recovered. Export of telecommunication, computer and information services almost doubled between 2012 and 2013, with rapid growth continuing between 2015 and 2017. This may be partly due to the relocation of headquarters of ICT companies to Cyprus, and the invoicing of ICT services through these headquarters. Despite the importance of the sector, exports of other business services are limited. This reflects an orientation of the sector to domestic clients and servicing SPEs and other FDI investors legally, but not necessarily physically, residing in Cyprus. As these transactions are between residents they are not recorded as exports. (Figure 26)

Figure 26 Exports of services by main economic activity, 2008-2017



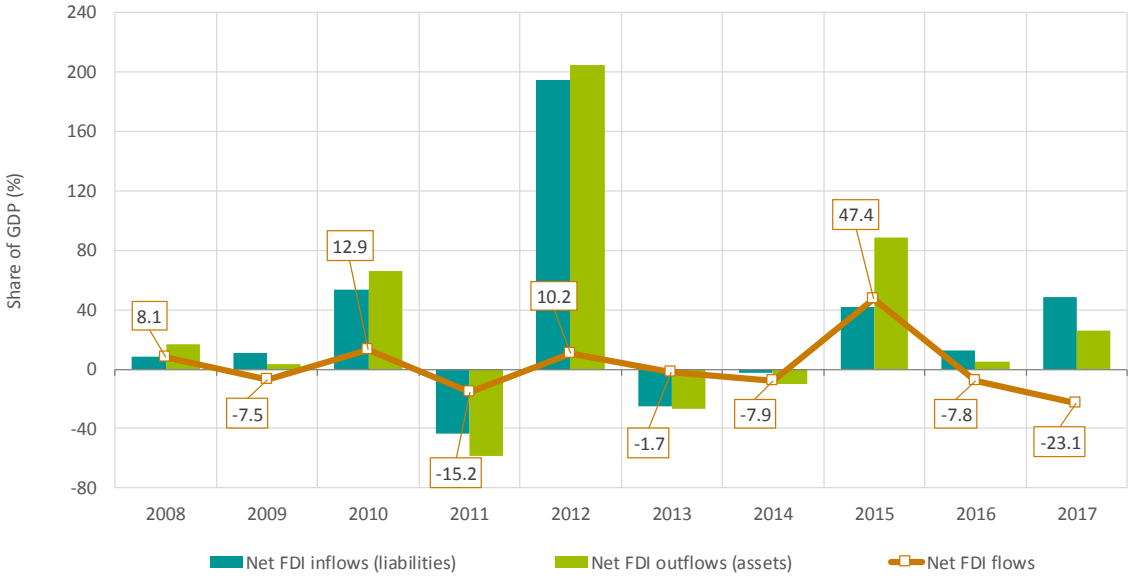
Note: Data for exports in communication services missing for 2014.
Source: Eurostat, International trade in services (since 2010) [bop_its6_det].

FDI balance

Foreign Direct Investment (FDI) is important to the economy of Cyprus but its overall contribution is not easy to evaluate. Year-on-year fluctuations in FDI flows are strongly influenced by transactions of Special Purpose Entities (SPEs). The parallel development of net inflows and outflows over time observed for Cyprus may be largely attributable to offsetting creation of foreign liabilities and assets of SPEs. In 2016 and 2017, net inward FDI transactions exceeded outward transactions resulting in a negative net figure. (Figure 27)

Note: Cyprus' FDI balance is influenced by transactions related to Special Purpose Entities (SPEs). Data on FDI flows for SPEs are not available but the Central Bank of Cyprus has published data on the net international investment position (NIIP) of SPEs. These data are described Section 3.3.

Figure 27 Foreign direct investment balance of transactions, 2008-2017



Notes: Value of net FDI inflows (liabilities) for 2012 unavailable from Eurostat, shown estimate calculated as difference of net FDI flow and net FDI outflow (assets) data.
Source: Eurostat, Balance of Payments [bop_gdp6_q]: Balance of Payments and International Investment Position items as share of GDP.

3.3 SPEs in the Balance of Payments

Special Purpose Entities (SPEs) have an important influence on the external statistics of Cyprus. To better understand this phenomenon, the Central Bank of Cyprus has published data that looks to separate SPE and non-SPE related flows and investment positions, treating SPEs as non-residents. Analysis using these data are presented below.

Overall, analysis of these data published by the Central Bank show that Cyprus' balance of payments can be properly understood only by explicitly considering the activities of SPE. The influence of SPEs needs to be accounted for when trying to draw conclusions about the competitive performance of the 'real' domestic economy.

Definition: Special Purpose Entities
A special purpose entity (SPE) resident in an economy is a formally registered and/or incorporated legal entity recognized as an institutional unit, with no or little employment up to maximum of five employees, no or little physical presence, and no or little physical production in the host economy.

SPEs are directly or indirectly controlled by non-residents. SPEs are established to obtain specific advantages provided by the host jurisdiction with an ob-

jective to (i) grant its owner(s) access to capital markets or sophisticated financial services; and/or (ii) isolate owner(s) from financial risks; and/or (iii) reduce regulatory and tax burden; and/or (iv) safeguard confidentiality of their transactions and owner(s). SPEs transact almost entirely with non-residents and a large part of their financial balance sheet typically consists of cross-border claims and liabilities.

International groups use SPEs in Cyprus to channel funds between related non-resident entities, by ship-owning companies whose economic owner is a CY resident, that register (and deregister) ships and, also, for worldwide invoicing on behalf of parent companies. These enterprises usually have little or only a minimal interaction with the domestic (real) economy.

Trade in goods and services

Between 2014 and 2017, SPEs accounted for between 33 and 45 percent of goods exports and between 17 and 30 percent of goods imports. In 2017, the value of goods imports by SPEs was equivalent to 10 percent of GDP, while exports were equivalent to about 4 percent. Trade in goods, and hence the current account of the economy, is affected by the registration and deregistration of ships (and aircraft) every year, which is usually relatively large when compared with the size of the Cypriot economy. (Figure 28)

SPE's share of trade in services is less significant, accounting for 8 to 10 percent of total service exports and between 6 to 8 percent of total service imports. In 2017, the value of services imports by SPEs was equivalent to over 4 percent of GDP, while exports were equivalent to over 2 percent of GDP. (Figure 28)

Figure 28 Goods and services trade for SPEs and non-SPEs, 2014-2017

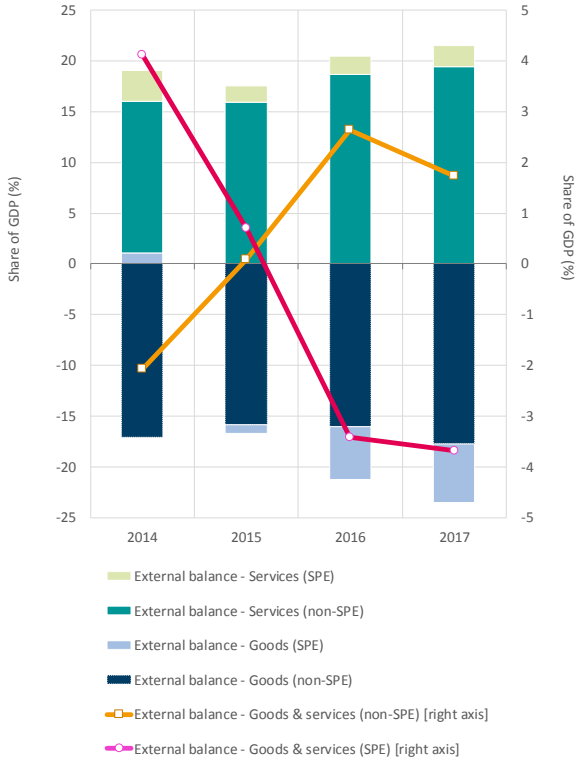
Source: Cyprus Central Bank: Core economic indicators with supplementary information on the impact of SPEs.

Balance of trade

In 2014, SPEs accounted for a small surplus for trade in goods. When the goods trade balance for SPEs has been in deficit, it added to the negative goods trade balance for the rest of the economy. In 2017, the net goods trade balance for SPEs amounted to a deficit of €1.1 billion, equivalent to nearly 6 percent of Cyprus' GDP. In comparison, there is a small surplus in SPE trade in services, equivalent to around 2 percent of GDP. (Figure 29)

Overall, the net combined trade (external) balance for goods and services attributable to SPE has moved from being in surplus in 2014 to a deficit in 2016 and 2017. Conversely, excluding SPEs, the overall balance of trade for goods and services of the rest of the economy has moved from deficit to surplus. (Figure 29)

Figure 29 Trade balance for SPEs and non-SPEs, 2014-2017



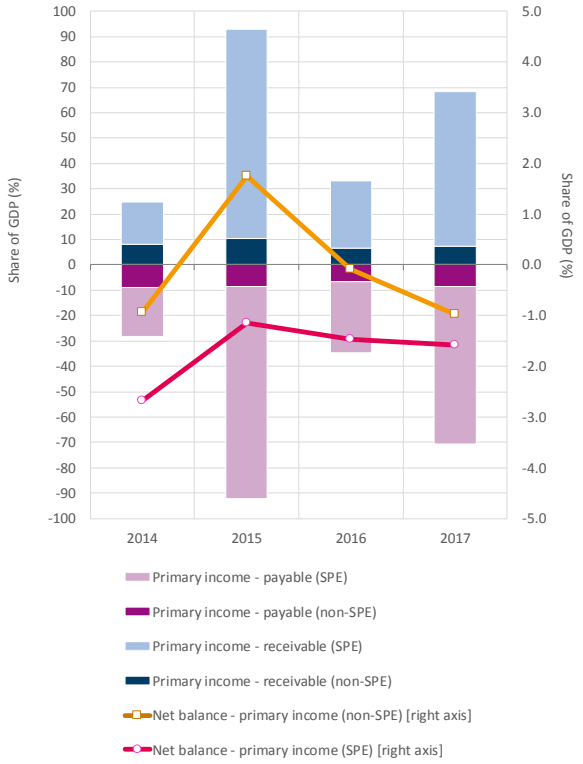
Source: Cyprus Central Bank: Core economic indicators with supplementary information on the impact of SPEs.

Primary account

SPEs are responsible for a very large proportion of primary income flows—i.e. income flows between resident and non-resident institutional units—in Cyprus' current account. Between 2015 and 2017, SPEs accounted for close to 90 percent of both inward (receivable) and outward (payable) primary account flows. This reflects the nature of SPEs and the channelling of large funds by these companies, which strongly increase gross figures for primary income flows. (Figure 30)

SPEs have consistently maintained a negative net balance during the four years for which data are available. For 2016 and 2017, the net negative balance for SPEs was equivalent to about 1.5 percent of GDP. (Figure 30)

Figure 30 Primary account for SPEs and non-SPEs, 2014-2017

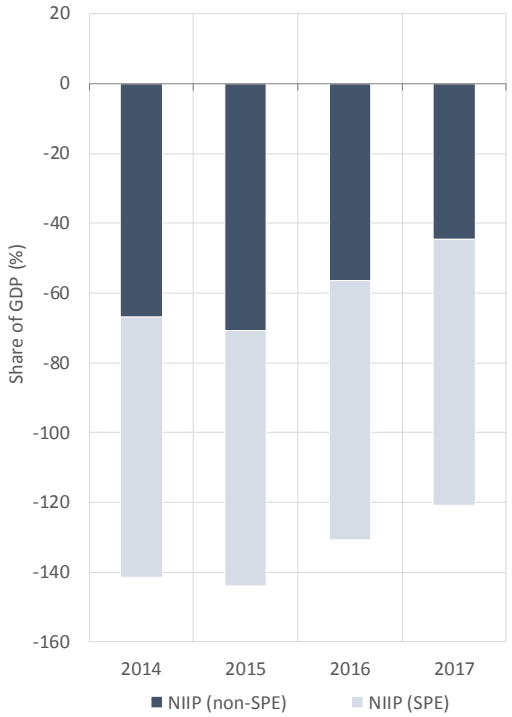


Source: Cyprus Central Bank: Core economic indicators with supplementary information on the impact of SPEs.

Net international investment position (NIIP)

The share of SPEs in the net international investment position has risen from 53 percent in 2014 to 63 percent in 2017, though this is mostly due to a contraction in the NIIP position of non-SPE entities. At the end of 2017, the stock of financial liabilities of SPEs exceeded their asset by over €15.3 billion, equivalent to around 80 percent of Cyprus' GDP. In other words, the value of SPE-owned assets held in Cyprus (liabilities) far outweigh SPE-owned assets held outside the country. This is mainly due to ship-owning companies, which have financial liabilities (for example, loans from abroad) while their assets are mainly real assets (i.e. ships). In the NIIP, only financial instruments are included and therefore, ships, which are real assets, are not included in the NIIP. (Figure 31)

Figure 31 NIIP for SPEs and non-SPEs, 2014-2017



Source: Cyprus Central Bank: Core economic indicators with supplementary information on the impact of SPEs.

4 Introduction to benchmarking Cyprus' competitiveness

Cyprus ranks reasonably well in international competitiveness rankings, such as the World Economic Forum Global Competitiveness Report, the IMD World Competitiveness ranking, and the World Bank Doing Business index. Over the years, Cyprus' rank has fluctuated considerably and has taken a particularly pronounced dip during the 2012-13 banking crisis. However, Cyprus has also improved in recent years, rising to the 44th place in the most recent 2019 World Economic Forum Global Competitiveness ranking.

To allow a proper assessment of Cyprus competitive performance, this report benchmarks the situation of Cyprus against 12 comparable countries. The choice of benchmark countries is based on multiple criteria, including similarities to Cyprus in terms of economic size, geographical proximity, or island or peripheral EU location. These countries are Denmark, Estonia, Finland, Germany, Greece, Ireland, Malta, the Netherlands, Portugal, Slovenia, the UK, and Israel (as the only non-EU country). The choice of these mostly highly competitive countries also reflects the ambition of the Cyprus government to compete with the best-performing countries.

4.1 Cyprus in international competitiveness reports

International competitiveness benchmark reports and rankings have garnered increasing attention, often being widely reported in the media and serving as a reference point in public debate on economic and industry-related policies. They also work as an information source for investors and the business community. While the underlying methodologies and correct interpretation of findings is often debated (see Box), the prominence given to these reports and rankings is witness to their popularity as a tool for quick comparison of national competitiveness across countries or time.

From a policy perspective, such reports can highlight areas of relative strength or weakness or where competitive conditions are improving or deteriorating. However, even if they aim to integrate indicators that reflect drivers of competitiveness, the rankings provide a picture based largely on the present or recently past situation, which does not necessarily provide a reliable forecasting tool for a country's future development.

The following sub-sections briefly describe the competitiveness situation of Cyprus in three of the most prominent international comparative competitiveness publications. A more comprehensive presentation, covering a wider range of competitiveness indices, is provided in Annex II.

Methodological issues for the construction of national competitiveness indices and rankings

Headline comparative rankings of national competitiveness are typically based on composite indices that aggregate across a number of indicators. These Indicators may be based on quantified data and statistical measures or, as is often the case, findings from perceptions surveys or expert judgements. The construction of competitiveness indices and rankings poses three fundamental methodological challenges: (1) to make an appropriate selection of suitable indicators; (2) to develop a mechanism that allows indicators—often with different units and scales of measurement—to be aggregated into meaningful composite indices; and (3) when information is drawn from perceptions surveys or expert judgements, to ensure that subjective biases do not have an undue influence on the objectivity and comparability of indicators and indices across countries, over time, or in relation to different competitiveness themes. Furthermore, variations in the number of experts consulted in each country might lead to measurement errors.

In view of the above, when confronted by 'headline' rankings that aim to synthesise national competitiveness within a single measure, it is important to recognise that such indicators mask considerable conceptual and methodological complexities and can only be properly understood if these complexities are taken into account. Taking headline figures at face value can easily lead to misinterpreting a nation's competitive situation and the factors that drive its competitive performance.

WEF Global Competitiveness Index

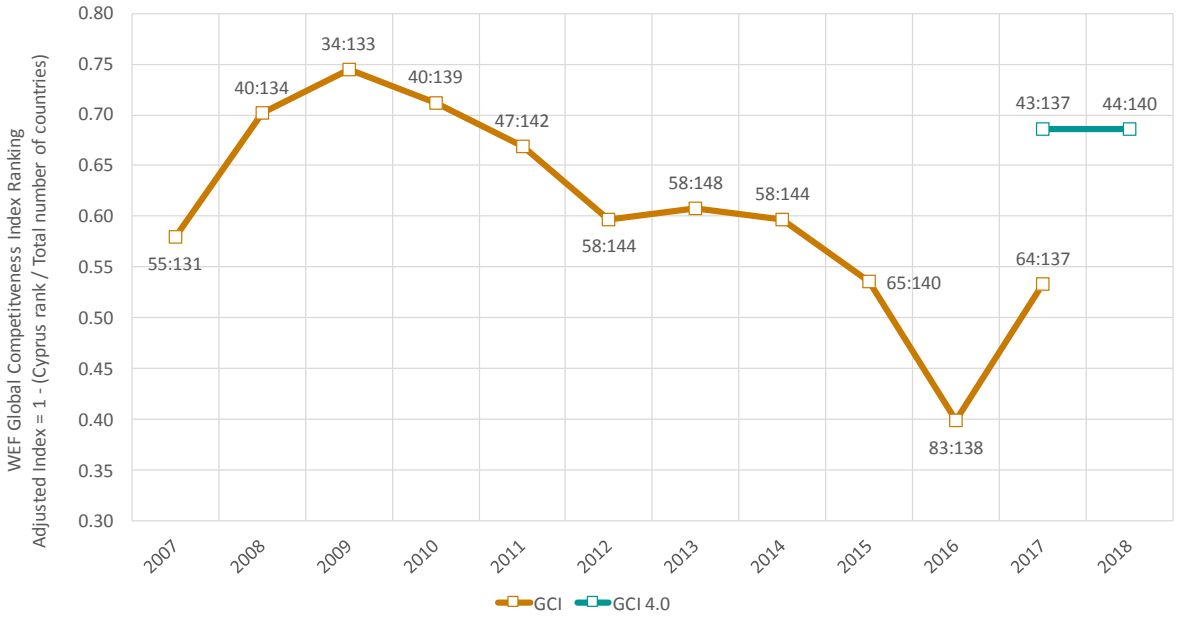
Among the most prominent international competitiveness rankings is the Global Competitiveness Index (GCI) from the World Economic Forum (WEF). This index, produced annually since 1979 and covering almost all countries in the world, integrates 12 competitiveness pillars that address aspects such as infrastructure, the macroeconomic environment, and business sophistication. The Global Competitiveness Index makes extensive use of an opinion survey that gathers perceptions on a host of competitiveness-related national conditions, supported by complementary indicators based on statistical data.

Having risen to 34th position in 2009, Cyprus slid down WEF's overall competitiveness ranking to reach a low of 83rd in 2016, before rising to 64th in 2017. The 2018 edition of the Global Competitiveness Index—labelled GCI 4.0—brought significant methodological changes. The new index places Cyprus 44th out of 140 countries in 2018, with a revised calculation for 2017 placing Cyprus in 43rd position. (Figure 32)

Much of the fall in Cyprus' GCI ranking between 2009 and 2016 can be attributed to the 2008 global financial crisis and especially the effects of the banking crisis. This can be seen through the sharp decline in Cyprus' ranking for the pillars *Macroeconomic environment* and *Financial market development*. Although these shifts are primarily due to cyclical factors, the WEF rankings also show declines in other competitiveness pillars compared to Cyprus' peak in 2009-10. Notably, Cyprus' relative position in terms of *Health and primary education*, *Higher education and training*, *Institutions*, *Business sophistication* and *Innovation* has worsened over the years. The two areas where Cyprus has improved are *Technological readiness* and *Labour market efficiency*. (Figure 33)

Turning to the new GCI 4.0 index, the change in methodology reduced the possibilities to make comparisons over time, both for Cyprus' overall country ranking, and its ranking for individual pillars. Nonetheless, the overall picture for Cyprus remains similar to earlier versions of the methodology. The 2018 report shows a strong position for the pillars of *Product market*, *Labour market*, *Health* and *Skills* but a weak position for *Macroeconomic stability* and *Financial system*. (Figure 34)

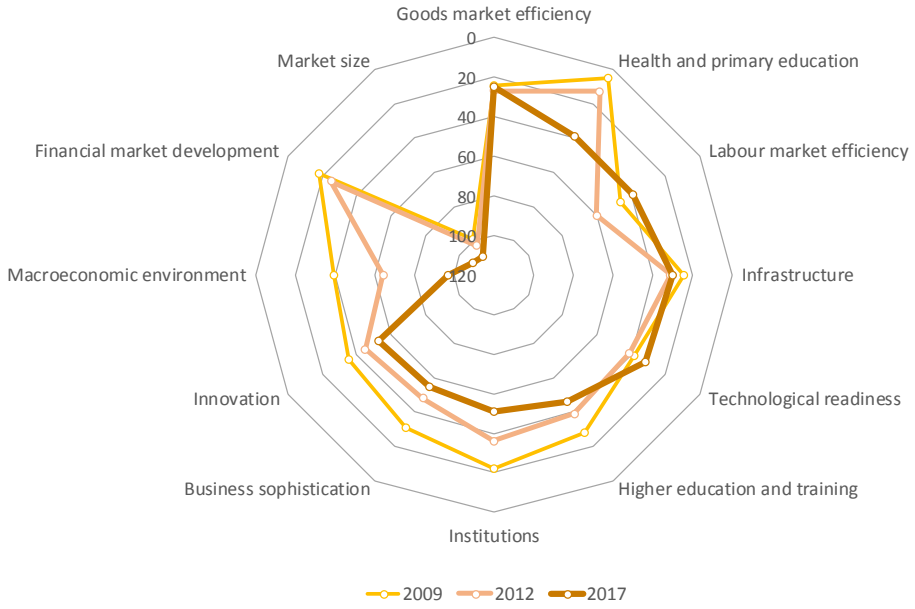
Figure 32 WEF Global Competitiveness Index Ranking of Cyprus, 2007-2018



Note: Due to changes in the methodology (e.g. changes in weights for the aggregate index/pillars), the previous GCI index and the new GCI 4.0 index are shown separately. Data using the new GCI 4.0 methodology are available only for 2017 and 2018.

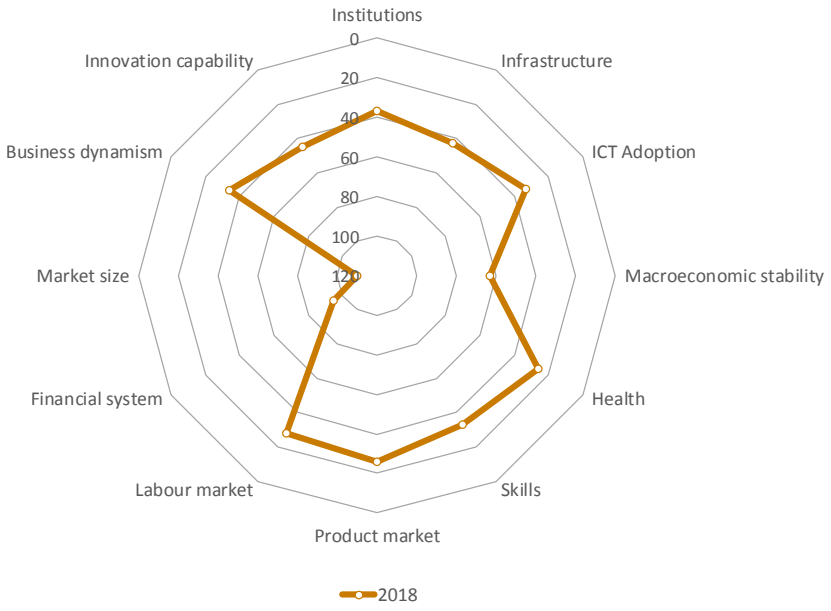
Source: World Economic Forum (WEF), Global Competitiveness Reports, 2008 to 2019 editions.

Figure 33 WEF GCI ranking of Cyprus by competitiveness pillar, 2009, 2012 and 2017



Source: World Economic Forum (WEF), Global Competitiveness Reports, 2010, 2013 and 2018 editions.

Figure 34 WEF GCI4.0 ranking of Cyprus by competitiveness pillar, 2018



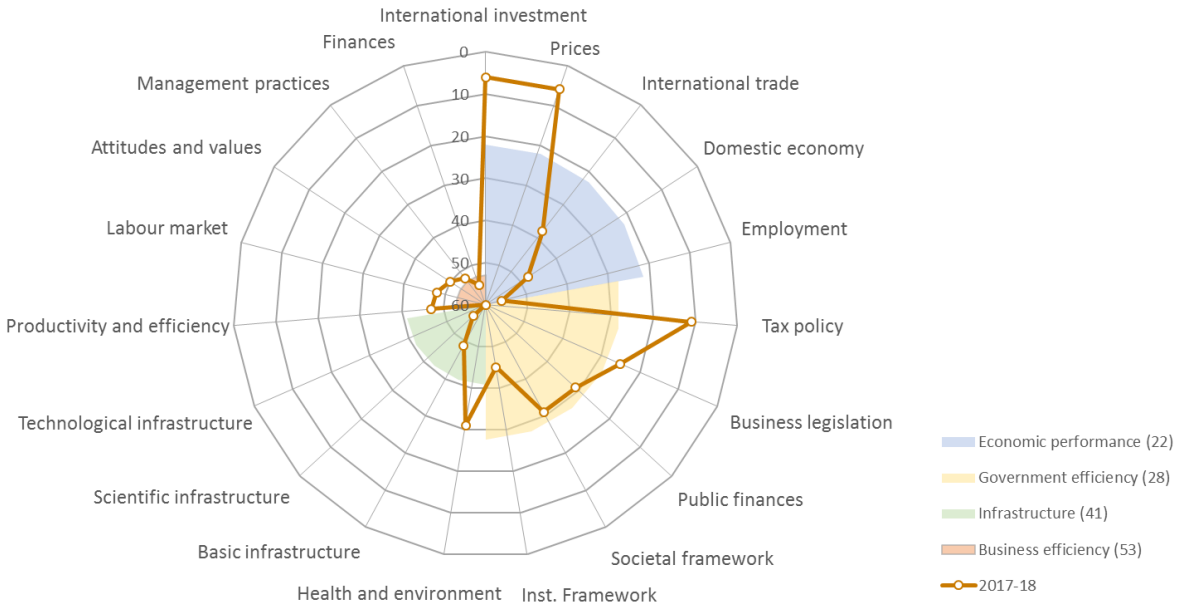
Source: World Economic Forum (2019).

IMD World Competitiveness Rankings

Cyprus was only added to the World Competitiveness Yearbook of the International Institute for Management Development (IMD) in 2017. The Yearbook covers over 60, mostly developed, countries and relies on a mix of statistical indicators and findings from a perceptions survey. Its approach is broadly comparable to the Global Competitiveness Index. The IMD indicators are combined into 20 categories that are presented under four broad headings of *Economic performance*, *Government efficiency*, *Business efficiency*, and *Infrastructure*.

In 2018, IMD ranked Cyprus in 41st position among 63 countries for its overall competitiveness performance, down slightly from 37th in 2017. This headline figure masks considerable difference in performance across areas. For general economic performance, Cyprus ranked 22nd, scoring a high 6th position for *International investments* and *Prices* but trailing in the categories of *Domestic economy* and *Employment*, where it came in 48th and 56th position respectively. The IMD analysis finds that Cyprus performs relatively weakly in *Business efficiency* in all categories, reaching 47th position for *Productivity and efficiency* and 55th position for the category *Finance*. Cyprus also performs weakly in for *Technological infrastructure* (60th position) and *Scientific infrastructure* (56th position). (Figure 35)

Figure 35 IMD World Competitiveness ranking of Cyprus by competitiveness pillar, 2017



Source: International Institute for Management Development (2018).

World Bank Doing Business

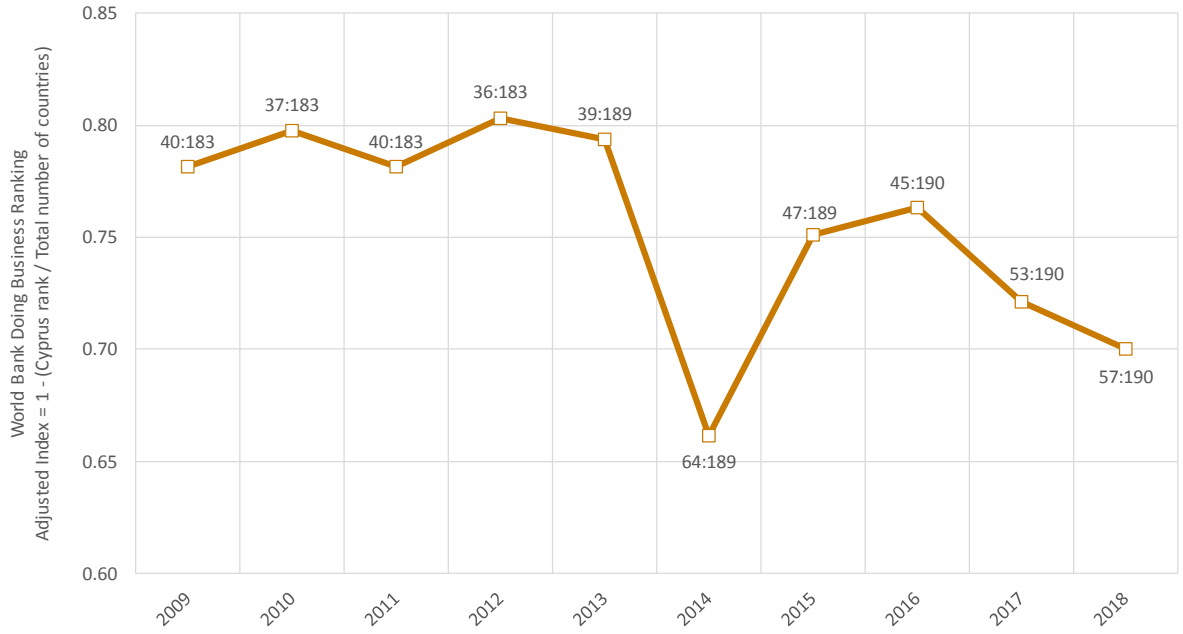
While the WEF and IMD reports and rankings offer comprehensive coverage of multiple competitiveness themes, the World Bank's Doing Business Report focusses more narrowly on the business environment. Cyprus was first included in the 2010 Report, with headline estimates given for 2009. The ranking is based on 10 doing business topics, such as the ease of starting a business, getting credit, or trading across borders, with a range of statistical indicators and surveys of local experts used to quantify each topic, based on standardized cases, to ensure comparability across countries.

Cyprus' position in the Doing Business Ranking was stable from 2009 to 2014 but shows greater volatility thereafter, dropping to 64th position in 2015, rebounding to 47th and 45th position in 2016 and 2017, before slipping to 57th position in 2018.[4] (Figure 36) Some caution is necessary when tracking changes over time, as the method used to construct the ranking have changed several times, and underlying causes of changes in position can be difficult to ascertain. Nonetheless, the data suggest that Cyprus performs well in some topic areas (e.g. *Resolving insolvency*, *Protecting minority investors*, *Paying taxes* and *Trading across borders*) but has weaknesses in other areas (e.g. *Enforcing contracts*, *Dealing with construction permits*' and *Registering property*).

Smaller changes over time should not be over-interpreted. However, the large improvement in *Getting electricity* is noteworthy, with Cyprus having improved from 160th position in 2015 to 70th position in 2018.

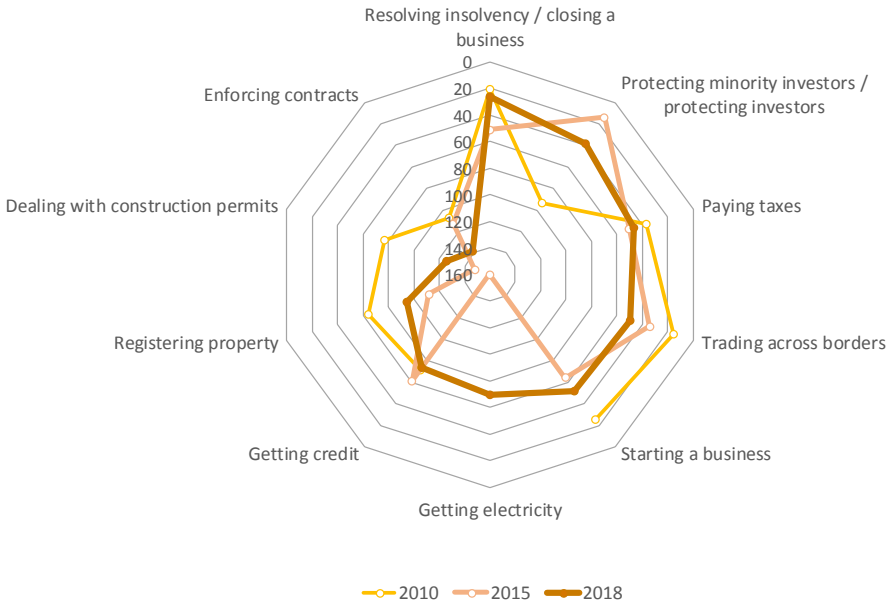
[4] Note: Year mentioned in the text refer to the time of collection of data rather than the title of the report; e.g. 2018 refers to the position in the World Bank report '*Doing Business 2019*'.

Figure 36 World Bank Doing Business ranking of Cyprus, 2009-18



Source: World Bank , Doing Business Reports 2010 to 2019.

Figure 37 World Bank Doing Business ranking of Cyprus by Competitiveness Pillar, various years



Notes: The topic 'Getting Electricity' was not included in the 2010 Doing Business Report.
Source: World Bank, Doing Business Reports 2010 to 2019.

There are some similarities in the assessment of Cyprus' competitive performance that arise from the three international benchmarking sources described above. Notably, Cyprus is penalised in both the WEF and IMD competitiveness rankings because of the small size of the country and its economy. This aside, the revisions to the WEF methodology has clearly impacted the evaluation of Cyprus' position for individual indicators. For example, Cyprus performs relatively well under the new GCI 4.0 pillar *Business dynamism* despite having slipped down the previous WEF-GCI ranking for *Business sophistication*. In comparison, for the performance of enterprises, MD places Cyprus close to the bottom of its rankings for *Business efficiency* measures, which include *Management practices*, *Productivity and efficiency* and *Attitudes and values*. Both reports also point to weaknesses in the institutional environment,

with IMD giving a low rank for Cyprus' *Institutional framework* and WEF-GCI showing a deteriorating relative performance for its *Institutions* pillar.

Concerning more specific elements of the business environment, Cyprus performs relatively well in business taxation, arriving in 47th position (among 190 countries) for *Paying taxes* in the World Bank's Doing Business rankings and in 11th position (among 63 countries) for *Tax policy* in IMD's Competitiveness Yearbook.

Overall, the World Bank's Doing Business indicators related to business legislation and administrative conditions show a mixed picture, with a strong position for *Protecting minority investors* and *Resolving insolvency* but a weak showing for *Enforcing contracts*. The closest equivalent in the IMD ranking, *Business legislation*, ranks Cyprus in 25th position.

4.2 The benchmark countries

To allow a proper assessment of Cyprus competitive performance, this report benchmarks the situation of Cyprus against 12 countries. The choice of countries is based on multiple criteria, including similarities to Cyprus in terms of economic size, geographical proximity, or an island or peripheral EU location. The selection criteria also include countries that are important trading partners or international trade competitors of Cyprus, alongside countries identified as among those with the strongest national competitiveness performance. Finally, data availability and comparability consideration were included in the selection criteria. The final list of benchmark countries includes Denmark, Estonia, Finland, Germany, Greece, Ireland, Malta, the Netherlands, Portugal, Slovenia, the UK, and Israel (where comparable data are readily available).

Key characteristics, growth and economic structure

After Malta, Cyprus is the second smallest country in terms of population size and gross national income compared to the other countries in this benchmark. On an income per capita basis, based on purchasing power standards, Cyprus ranks in 10th position. (Table 1)

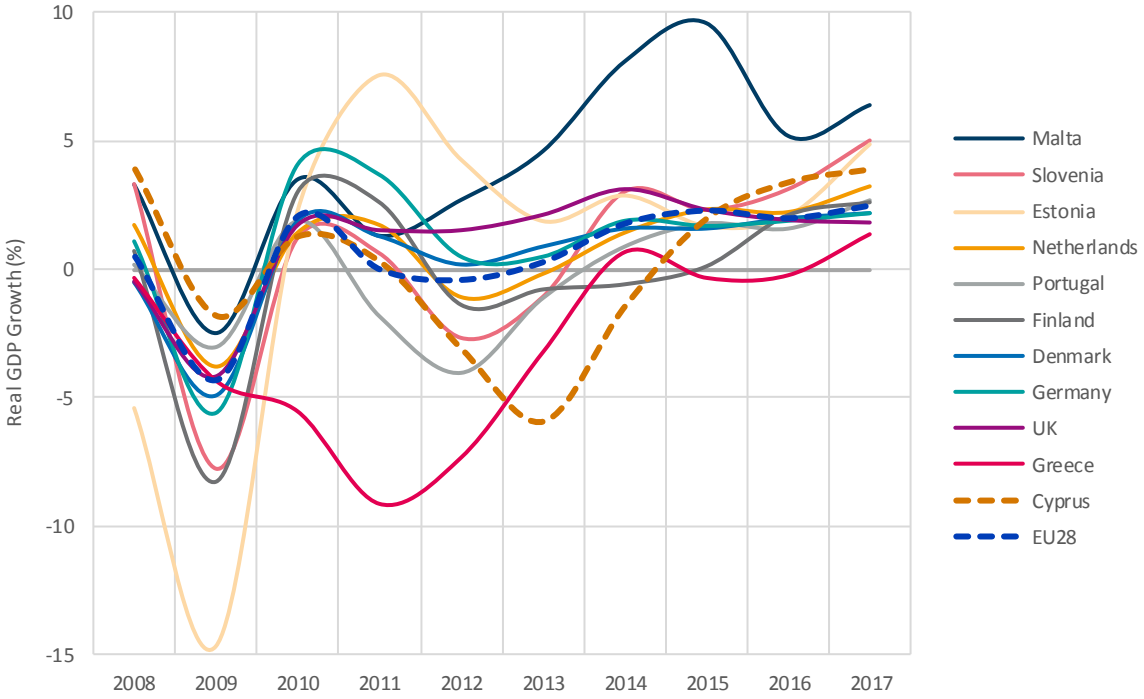
Compared to the benchmark countries, Cyprus weathered the 2008 global financial crisis relatively well but was hit severely by the European debt crisis, especially because of its links to the Greek economy. Cyprus returned to GDP growth in 2015, with the growth rate reaching 3.9 percent in 2017, placing it alongside the fastest growing economies among the benchmark countries. (Figure 38)

Table 1 Population and Gross National Income (GNI), 2017

	Population millions (rank)	GNI Euro billions (rank)	GNI per capita Euro thousand (rank)	GNI per capita at PPS Euro thousand (rank)
Cyprus	1.2 (12)	23 (12)	26.8 (9)	38.0 (10)
Denmark	5.8 (7)	360 (5)	62.4 (2)	58.3 (4)
Estonia	1.3 (11)	27 (11)	20.6 (12)	35.0 (12)
Finland	5.5 (8)	278 (7)	50.4 (4)	51.7 (5)
Germany	82.7 (1)	4064 (1)	49.1 (5)	58.5 (3)
Greece	10.8 (4)	220 (9)	20.4 (13)	31.4 (13)
Ireland	4.8 (9)	301 (6)	62.5 (1)	70.6 (1)
Israel	8.7 (6)	367 (4)	42.1 (7)	43.0 (7)
Malta	0.5 (13)	13 (13)	26.9 (8)	41.5 (8)
Netherlands	17.1 (3)	894 (3)	52.2 (3)	59.5 (2)
Portugal	10.3 (5)	231 (8)	22.4 (11)	35.6 (11)
Slovenia	2.1 (10)	51 (10)	24.9 (10)	38.3 (9)
UK	66.0 (2)	3024 (2)	45.8 (6)	48.8 (6)

Notes: GNI = Gross National Income; PPS = Purchasing Power Standard; Converted from $US, €1 = $1.13.
Source: World Bank, World Development Indicators.

Figure 38 Real GDP growth, 2008-2017



Note: Ireland (not shown) achieved GDP growth of 25.6 percent in 2015, which can largely be attributed to profit shifting activities of multinationals (Council on Foreign Relations, 2018).
Source: Eurostat, Real GDP Growth Rate [tec00115].

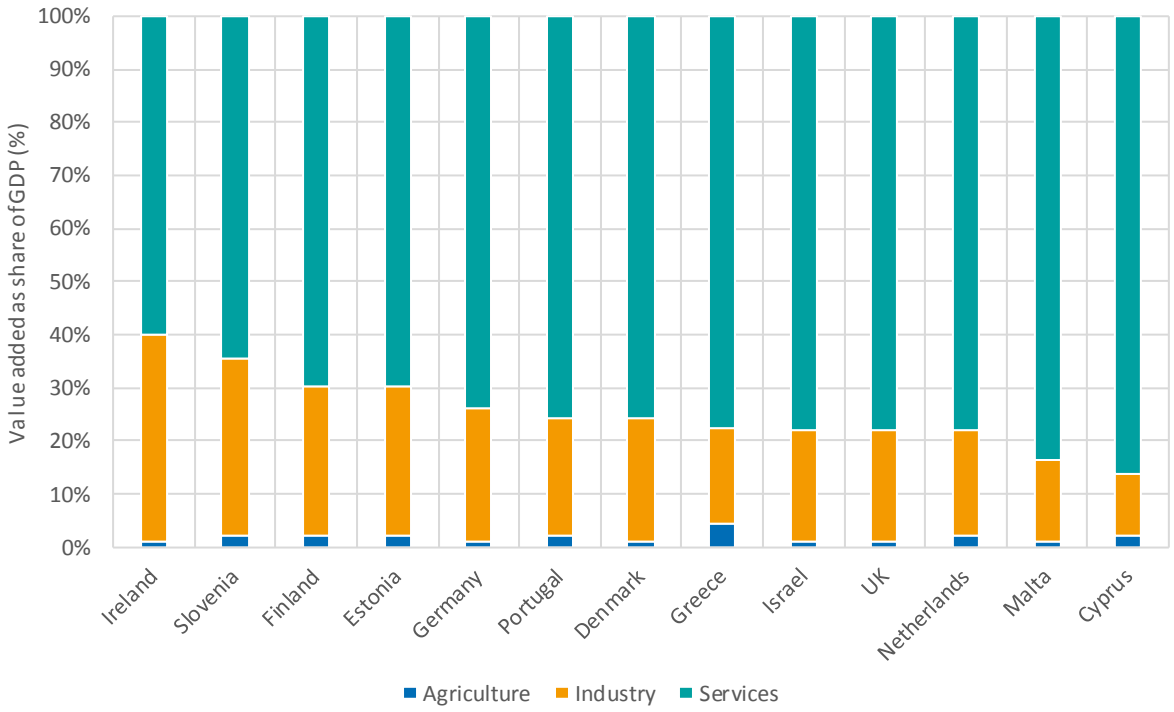
Among the benchmark countries, Cyprus has the highest share over GDP in service industries and the lowest share over GDP in industry, which includes manufacturing, mining, energy and utilities. (Figure 39)

The economy of Cyprus consists primarily of small and medium-sized enterprises, although this situation is not exceptional when compared to other benchmark countries. Although the share of employment in SMEs is high in Cyprus when compared to the EU av-

erage and to larger economies such as Germany or the UK, it is similar to the shares observed in economies of comparable size, such as Malta or Estonia. Cyprus stands out, however, for its low share or employment in larger enterprises with more than 250 employees.

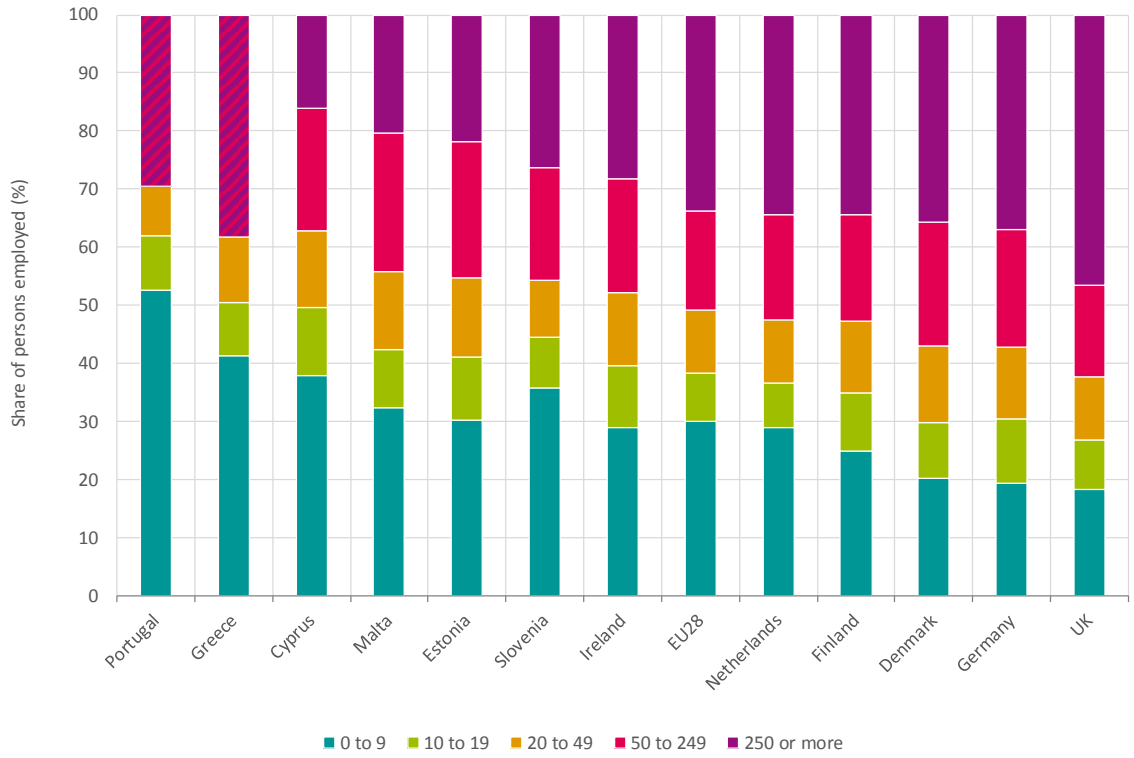
Given the role that larger enterprises can play in shaping a country's pattern of economic specialisation and export potential, as well as serving as anchors for value chain integration, the absence of larger enterprises is a potential concern. (Figure 40)

Figure 39 Economic structure, 2017



Source: World Bank, World Development Indicators: Structure of output [T4.2].

Figure 40 Employment in the non-financial business economy by enterprise size (employees), 2015



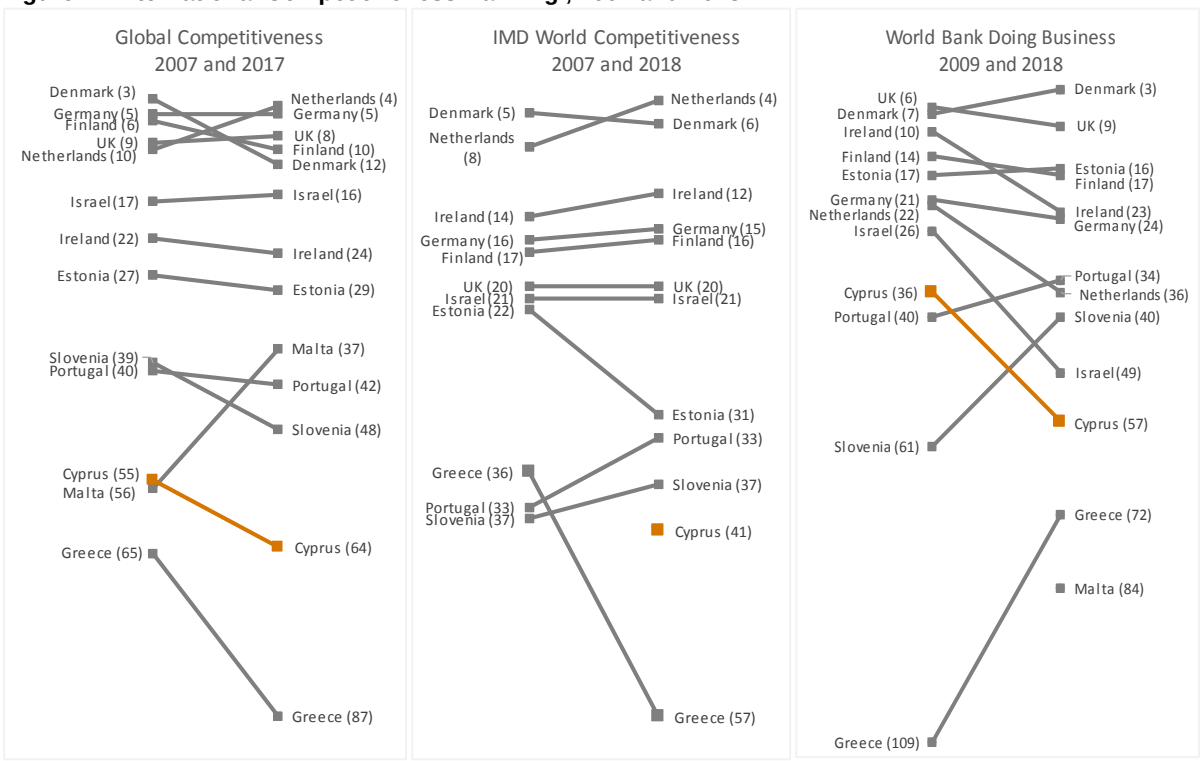
Notes: The non-financial business economy includes the sectors of industry, construction and distributive trades and services. It refers to economic activities covered by Sections B to J and L to N including S95 of NACE Rev. 2. Estimates based on earlier years for Cyprus ('0 to 9' and '50 to 249'), Denmark ('10 to 19' and '20 to 49'), Ireland ('10 to 19', '50 to 249' and '250 or more') and EU28 ('0 to 9' and '10 to 19'). For Portugal and Greece, the size categories '50 to 249' and '250 or more' are combined.

Source: Eurostat, Annual Enterprise Statistics by size class for special aggregates of activities [sbs_sc_sca_r2] and own calculation.

Performance of the benchmark countries in international competitiveness rankings

As noted earlier, the methodology of the WEF Global Competitiveness Index changed in 2018, meaning that direct comparison cannot be made between the latest ranking and those from earlier years. However, for both the old methodology for 2017 and the new methodology for 2018, WEF ranks Cyprus behind all benchmark countries except Greece. Comparing 2017 with 2007 (using the old methodology), Greece saw the largest fall in its ranking position, followed by Denmark, Cyprus, and Slovenia that all slipped nine places. The largest increase is observed for Malta, which ranked one place below Cyprus in 2007 but sat 27 places above in 2017. (Figure 41, left) However, using the new methodology for 2018, Slovenia, Cyprus and Greece all achieve a significantly higher rank, respectively positioned 35th, 44th and 57th. Cyprus is similarly positioned relative to the other benchmark countries in the IMD's World Competitiveness Yearbook, where it ranks only above Greece. (Figure 41, middle) Similarly, the World Bank's Doing Business Report ranks Cyprus above Greece and Malta but it has slipped behind Slovenia and Portugal, while the gap between Cyprus and Greece has narrowed noticeably. (Figure 41, right)

Figure 41 International Competitiveness Ranking , 2007 and 2018



Notes: The Global Competitiveness ranking had 137 countries in 2017, 125 countries in 2007.
The World Competitiveness ranking had 63 countries in 2018, 55 countries in 2007. Cyprus was added in 2017, Malta is not included.
The Doing Business ranking had 190 countries in 2018, 183 countries in 2009. Cyprus was added in 2009.

Source: International Institute for Management Development (IMD), World Economic Forum and World Bank.

5 Competitiveness outcomes

Competitiveness outcomes serve as a yardstick for assessing overall competitiveness performance, and include productivity, trade and foreign direct investment, employment and jobs, and costs and prices. Labour productivity is lagging behind most, but not all, benchmark countries. Labour productivity in Cyprus is below the EU average and is lagging behind Northern European economies, but is comparable or exceeding labour productivity in other Mediterranean economies. Total factor productivity, which measures the productivity of all factors of production, has fallen in recent years, with the decline having been greater in Cyprus than in any other benchmark country except Greece.

Cyprus' overall exports as a share of GDP are above the EU average, but are heavily skewed towards service exports. Cyprus is one of the few benchmark countries with a negative current account balance. Foreign direct investment inflows are relatively modest compared to most benchmark countries, after accounting for FDI driven by special-purpose entities. Employment levels have suffered significantly after the 2008 global financial crisis and the 2012-13 banking crisis and have yet to recover fully. Lastly, while the costs of labour and real estate are relatively low, businesses face higher than average costs for electricity and broadband internet access.

5.1 Productivity

Productivity performance is regarded as one of the most important indicators and main 'intermediate' outcomes for national competitiveness. High productivity can drive exports and attract investment, contributing to employment and higher wages while reducing the cost of production. Productivity growth determines real economic growth and, in turn, prosperity. For this reason, it is treated by some competitiveness reports as a proxy for national competitiveness.[5]

However, caution is required in the interpretation of productivity indicators due to conceptual and measurement issues. This applies particularly to the measurement of productivity in service activities that are especially important for Cyprus, with both the value of inputs and outputs often being difficult to quantify. Also, measurement of service outputs can be affected by changes in asset values rather than productivity changes. Notwithstanding this caveat, indicators consistently show that Cyprus achieves relatively low productivity levels and growth rates compared to the benchmark countries.

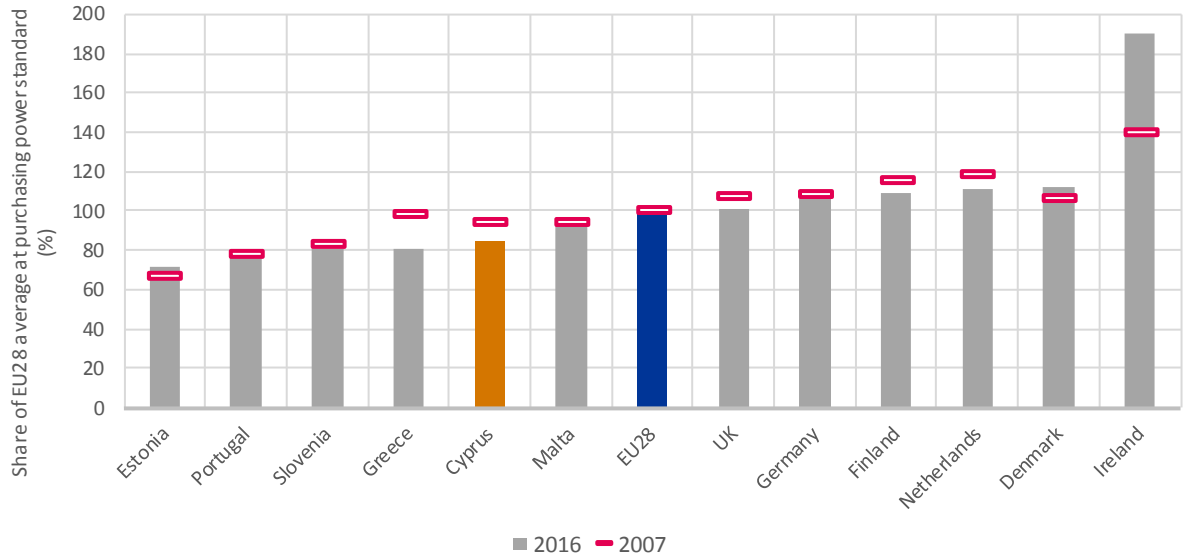
Labour productivity

Labour productivity, measured by adjusting for price-level differences between countries using the purchasing power standard measure of GDP, lags behind most, but not all, benchmark countries. Labour productivity in Cyprus is below the EU average and lags behind Northern European economies, such as the Netherlands and Finland. At the same time, labour productivity exceeds what is found in other Mediterranean economies. (Figure 42)

Definition: Labour productivity
Labour productivity is defined as output per unit of labour input. Output is typically taken to be real or current GDP or value-added, while units of labour are variously defined in terms of number of workers or hours worked, among others.

[5] The centrality of productivity to the concept of national competitiveness, together with its interrelation with external dimensions of competitiveness (i.e. trade and FDI), is discussed in Annex I.

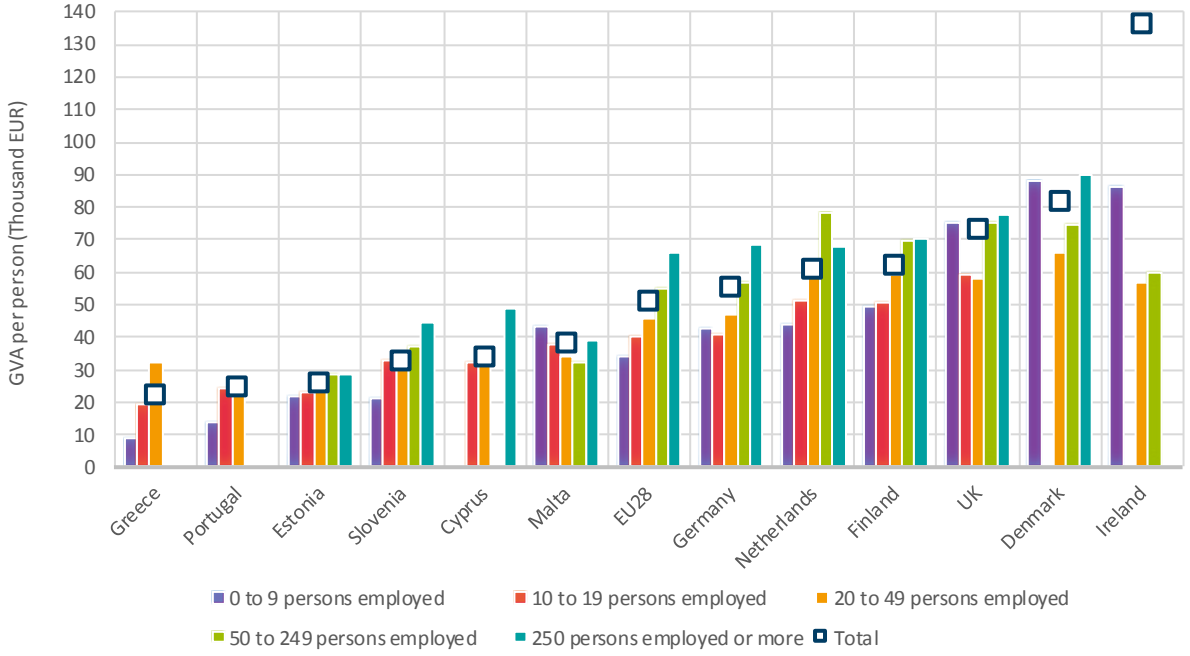
Figure 42 Labour productivity at PPS, 2007 and 2016



Note: Ireland's high labour productivity might also be related to the impact of profit shifting activities of multinationals on GDP (Council of Foreign Relations, 2018).
Source: Eurostat, Labour productivity and unit labour costs [nama_10_lp_ulc].

Availability of data on labour productivity by enterprise size is inconsistent. In most countries, including Cyprus, productivity is lower in smaller enterprises. Across all enterprise sizes, labour productivity in Cyprus is below the EU average and is behind the best-performing countries, such as the Denmark, the UK and Finland. This lag is slightly less pronounced for smaller enterprises, suggesting that the dominance of SMEs in the Cypriot economy and the small number of large enterprises also affects Cyprus' aggregate labour productivity. (Figure 43)

Figure 43 Apparent labour productivity (GVA per person employed) by enterprise size, 2015

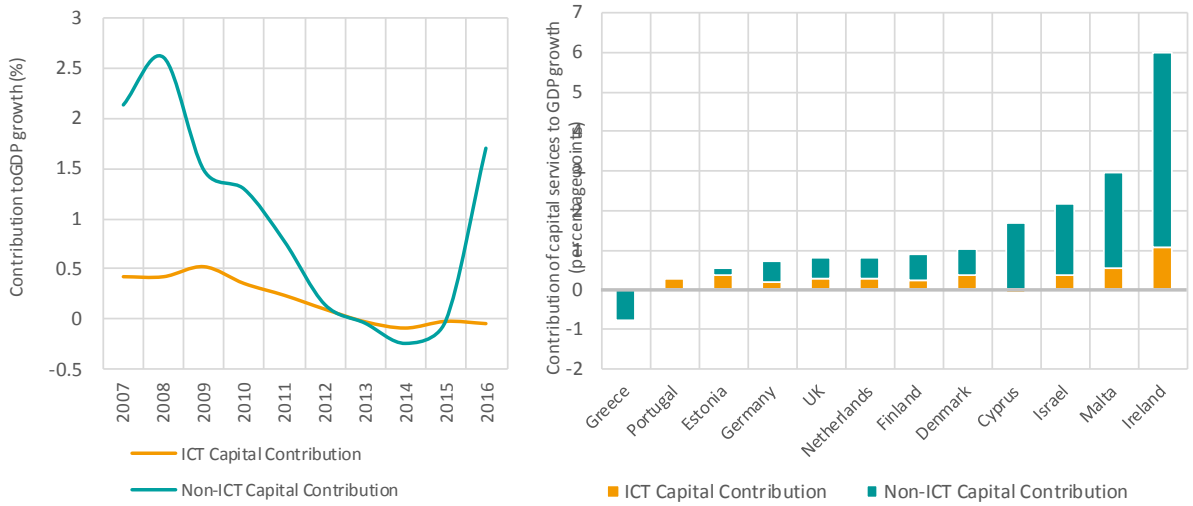


Note: Data missing for Enterprise Classes for five benchmarking countries; EU28 values for enterprise sizes 0-9, 10-19 and 20-40 from 2014.
Source: Eurostat, Annual enterprise statistics by size class for special aggregates of activities [sbs_sc_sca_r2].

Contribution of capital to GDP growth

As described in Section 3.2, capital services—essentially the flow of productive services provided by (physical) assets used in production—has played an important role in Cyprus' GDP growth, except during and shortly after the 2012-13 banking crisis. However, this contribution is derived mainly from non-ICT assets, with ICT assets making almost no contribution to GDP growth. (Figure 44)

Figure 44 Capital service contribution to GDP (Cyprus and benchmark countries), 2007-2016



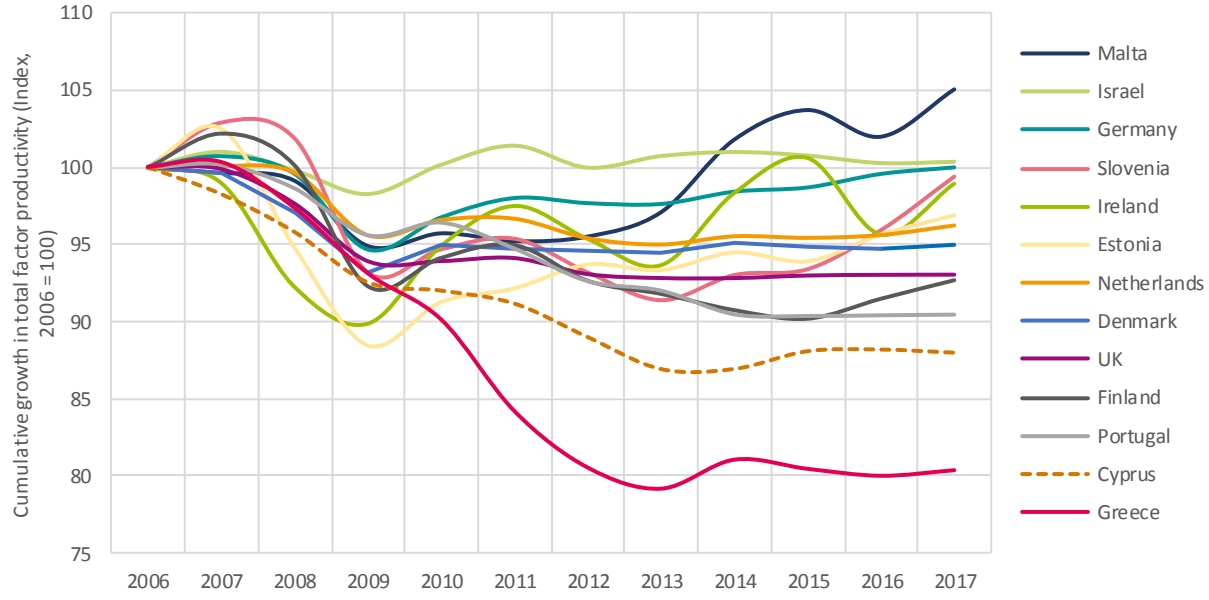
Note: Graph showing the contribution of capital services provided by assets to GDP growth, differentiated between ICT assets and non-ICT assets.
Source: Conference Board, Contribution of Total Capital Services to GDP growth, 2007-2016.

Total factor productivity

From 2010 to 2013, total factor productivity growth in Cyprus was consistently low compared to almost all benchmark countries. Consequently, total factor productivity in Cyprus has fallen since 2006, more so than in any other benchmark country except Greece. Although most countries faced similar declines, and the situation in Cyprus appears to have stabilised since 2013, the depth and persistence of the decline has been greater in Cyprus, except for Greece. (Figure 45)

As shown earlier in this report, labour and capital are the main drivers of GDP growth in Cyprus, with total factor productivity often making a negative contribution (see Figure 11 on page 33). The causes of low total factor productivity growth cannot be directly identified, but typically, low growth is associated with lower rates of enterprise innovation and lower adoption rates of digital and other efficiency-gaining technologies. Partly, low total factor productivity may reflect structural factors, such as a prevalence of small firms, and predominance of manual, labour-intensive service sectors. In Cyprus, investments in ICT and other productive capital are relatively low (see Figure 20 on page 39), which may be attributed to constraints on access to credit due to cautious lending by domestic credit institutions that still hold significant portfolios of non-performing loans, and because of stricter leverage regulations for new investment credit lines.

Figure 45 Total factor productivity growth, 2006-2017



Source: Conference Board, Growth of Total Factor Productivity, 2007-2017

5.2 Trade and foreign direct investment

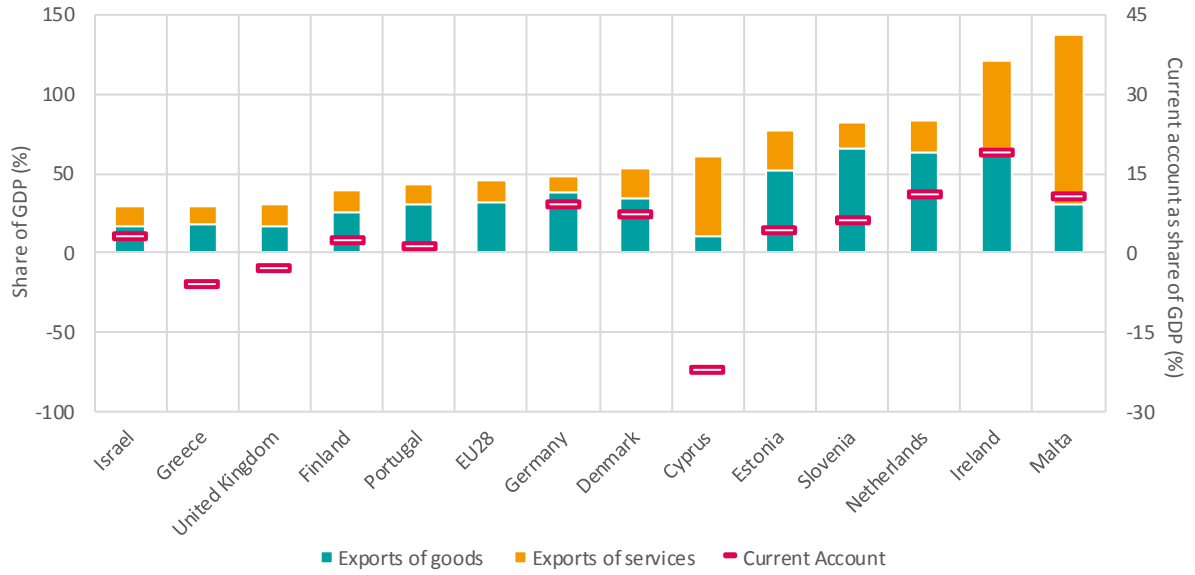
The ability to export goods and services, to enter new foreign markets and to gain and retain market share are, important outcome indicators of competitiveness. As is the ability to attract and retain foreign direct investment. However, the economic structure and business model of Cyprus, with its strong emphasis on services, pose challenges for assessing comparative performance in these areas. First, for goods trade, it is important to distinguish genuine domestic exports from re-exports and, also, the domestic value added to those exports. For the latter, value-added statistics for trade are not readily available for Cyprus.[6] Second, for trade in services, the detail and reliability of data are usually lower than for goods. With respect to both trade and FDI, as noted earlier in this report, transactions by Special Purpose Entities (SPEs) can strongly influence overall recorded investment values without reflecting the underlying competitive performance of the economy.

Trade performance

The economic structure and specialisation of Cyprus is reflected in trade statistics. Service exports account for a relatively large share of GDP compared to goods. While Cyprus' overall exports as a share of GDP are above the EU average, they are relatively low compared to other benchmark countries such as Malta, Estonia and Slovenia. The balance between goods and service in exports is also more even in other benchmark countries, except for Malta. Finally, the current account balance of Cyprus is negative, with only the UK and Greece among the benchmark countries also recording a negative balance. (Figure 46)

[6] The OECD Trade in Value-Added (TiVA) database only reports data for Cyprus until 2011.

Figure 46 Exports and current account, 2017



Note: Current account balance as percentage of GDP not available for the EU for 2017.
Source: Eurostat, GDP and main components (output, expenditure and income) [namq_10_gdp]. Data for Israel from World Bank, World Development Indicators: *Goods exports and services exports* [BX.GSR.MRCH.CD & BX.GSR.NFSV.CD] and *GDP (current US$)* [NY.GDP.MKTP.CD].

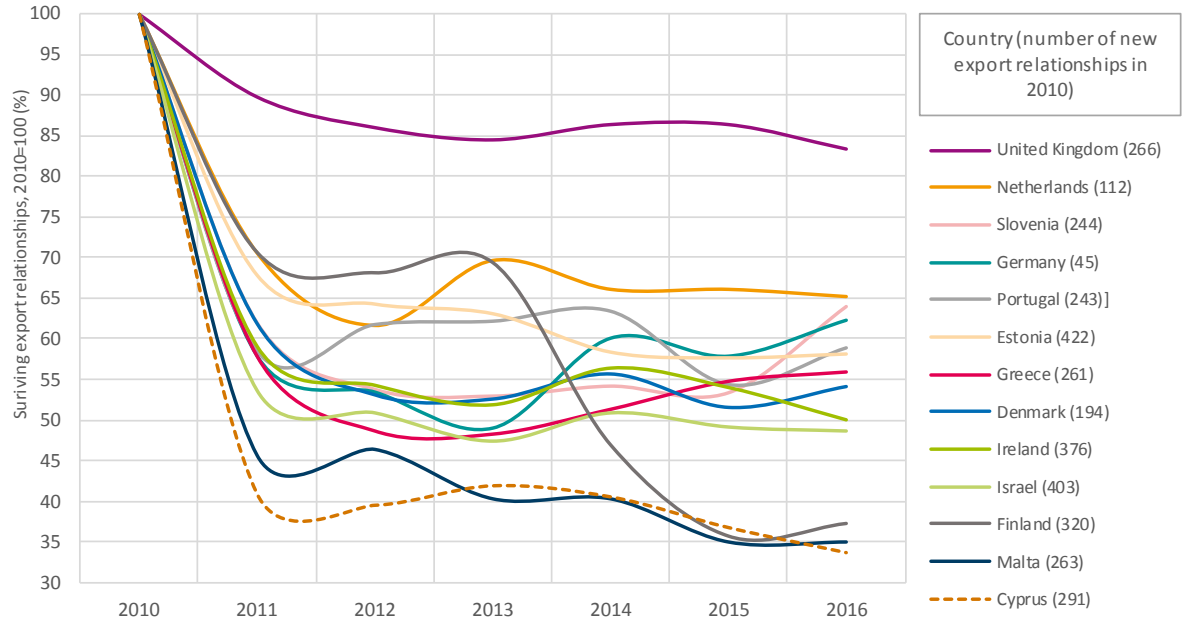
Export market survival

Estimates from the World Bank indicate that Cyprus develops fewer products for export and exports to fewer markets than other countries. For new products or destinations that began in 2010, the likelihood of it surviving for a year was only 41 percent, lower than for all other benchmark countries. After six years, the likelihood of this export relationship still existing is even lower at only 34 percent. (Figure 47) Findings for other years, not shown here, suggest a similar pattern. This suggests that Cypriot business may be less successful in establishing and sustaining export relationships than their counterparts in other benchmarked countries.

Definition: Export survival

Export survival looks at whether firms that have started exporting specific products to new foreign markets are able to survive in these markets. In the absence of readily available data at the firm level, the export survival indicator measure uses data at the product level as a proxy. The export survival indicator records the number of new product-partner relationships (with a trade value of at least US$10,000) in a given start year. A new relationship is considered to be a product-partner relationship for which there was no exports recorded in the previous year (e.g. if Cyprus exported natural honey to South Africa in 2010 but has not done so in the year before, it is counted as a new product-partner relationship). Then, in following years, the number of these relationships that are sustained is monitored (allowing for the inclusion of relationships that resume after a short hiatus). The export survival rate is then the percentage of new product-partner relationships formed in the start year that still exist in a subsequent year.

Figure 47 Export survival, 2010 to 2016

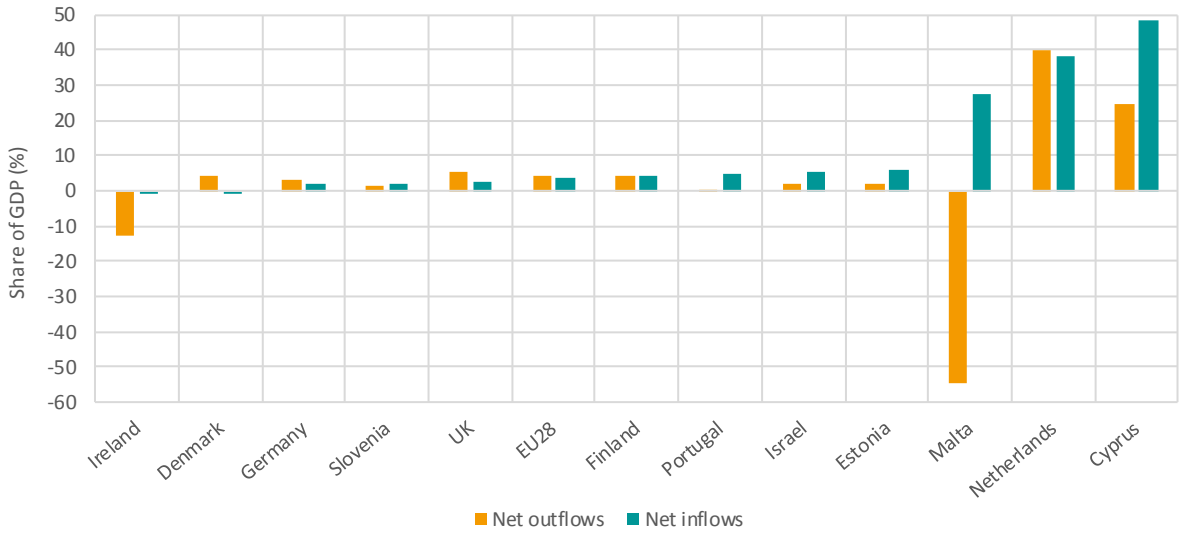


Source: World Bank, World Integrated Trade Solutions: *Export Survival - Export Duration.*

Foreign direct investment

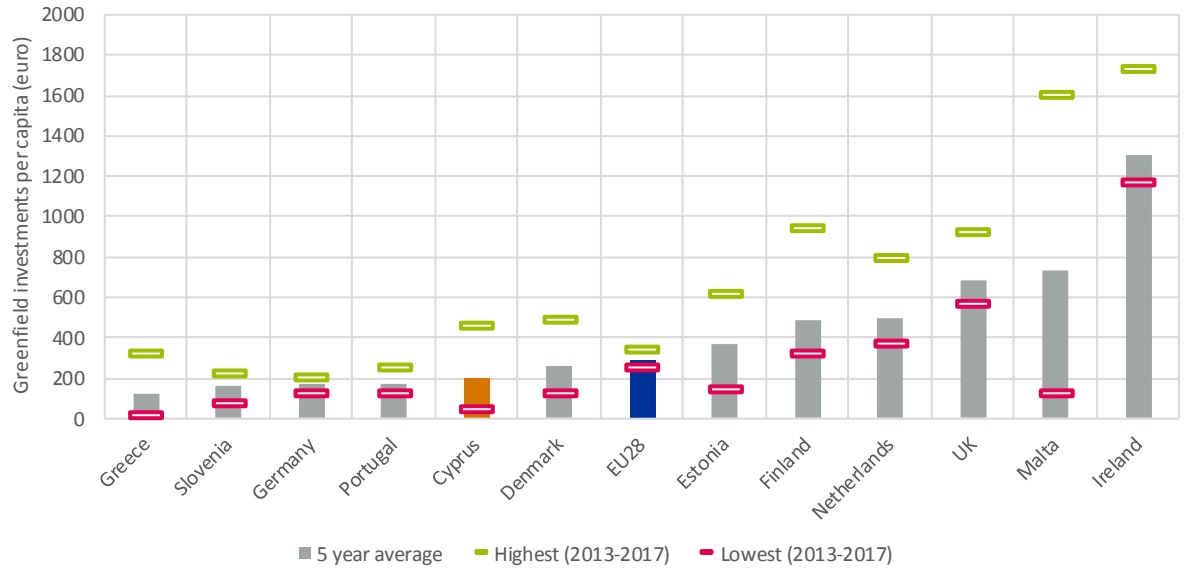
Cyprus shows high FDI inflows, at more than 13 percent of GDP. FDI Outflows, at almost 6 percent of GDP, are only exceeded by the Netherlands. (Figure 48) As described in Section 3.3, these headline FDI data include transactions related to the activities of Special Purpose Entities, implying that the numbers can overstate foreign investments in productive activities in the domestic economy. An alternative indicator of FDI, which does not include activities of SPEs, comes from the collection of data on announced greenfield FDI projects. The value of announced greenfield FDI projects in Cyprus is relatively modest compared to most benchmark countries. However, leaving aside a dip during the banking crisis, the value of announced investments is similar to Malta, Estonia and Slovenia. (Figure 49)

Figure 48 FDI inflows and outflows, 2017



Notes: Net values refer to the value of FDI flows (inflow or outflow) less the values of FDI disinvestments.
Source: World Bank, World Development Indicators: Foreign direct investment, net outflows (% of GDP) [BM.KLT.DINV.WD.GD.ZS] and Foreign direct investment, net inflows (% of GDP) [BX.KLT.DINV.WD.GD.ZS].

Figure 49 Greenfield investments, 5-year average between 2013 and 2017

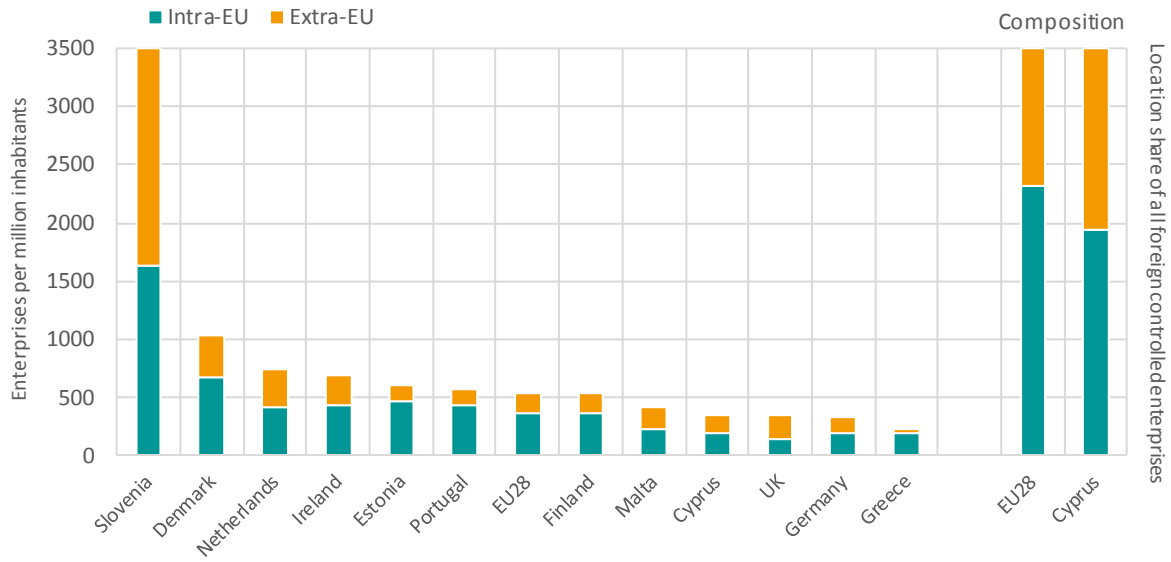


Notes: Own calculations, based on Greenfield Investments and converted to per capita value.
Data are based on press releases, media reports and data from business associations and investment agencies; these sources are unlikely to be complete and may contain information on announced FDI projects that do not materialise.
Source: UNCTAD (based on Financial Times Ltd, fDi Markets): Value of announced greenfield FDI projects.

Foreign controlled enterprises

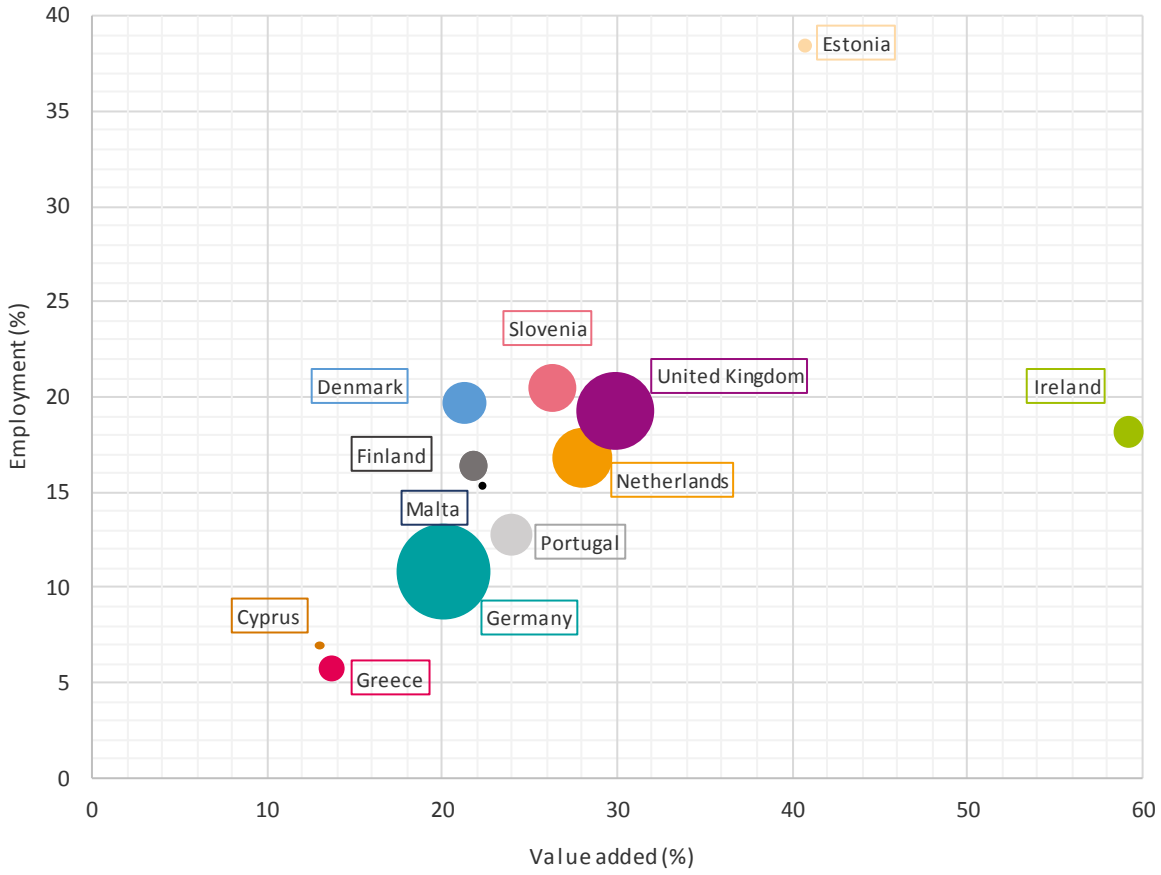
Foreign affiliate trade statistics (FATS) provide information on key economic indicators of foreign-controlled enterprises and exclude those SPEs that have no employees and no turnover. The number of foreign controlled enterprises in Cyprus is relatively low. In 2015 the number of foreign-controlled enterprises in Cyprus, measured on a per-capita basis, was below most benchmark countries. While Cyprus ranks slightly above the UK and Germany, their low ranking can be explained by their large size. Furthermore, nowhere other than in Greece is the share of foreign controlled enterprises in total employment and value-added as low as it is in Cyprus. (Figure 51)

Figure 50 Location of foreign controlled enterprises, 2015



Source: Eurostat, Foreign control of enterprises by economic activity and a selection of controlling countries (from 2008 onwards) [fats_g1a_08].

Figure 51 Foreign controlled enterprises, 2015



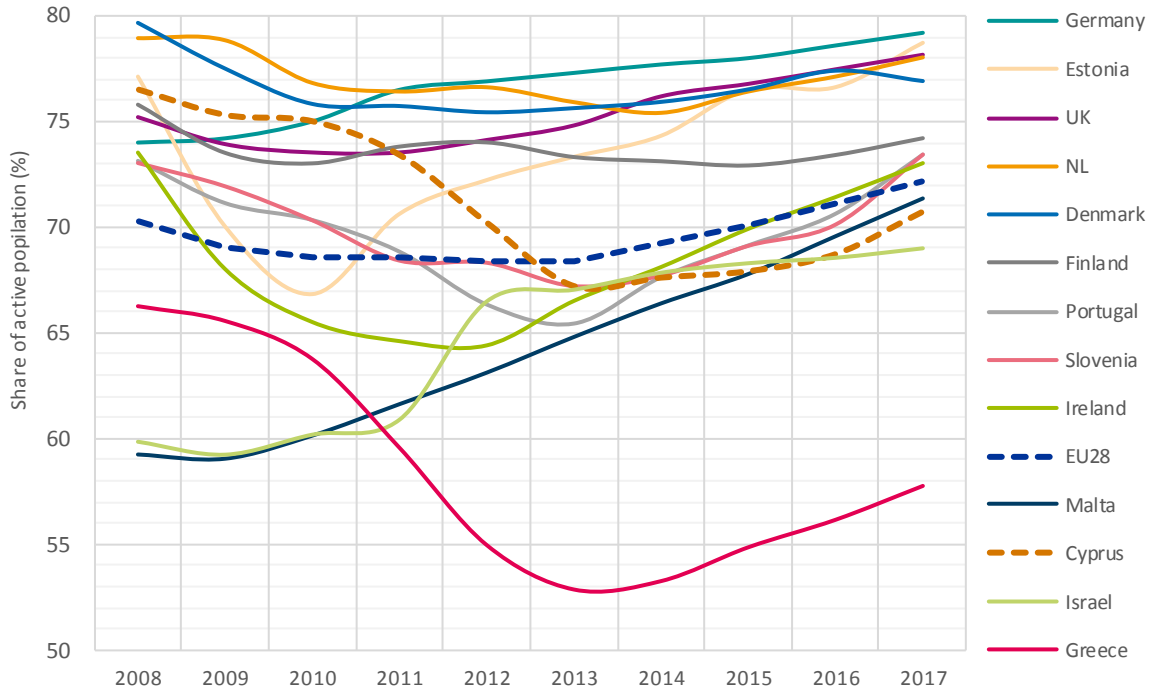
Note: Size of the bubbles represents the number of Foreign Controlled Enterprises in the country.
Source: Eurostat, Foreign control of enterprises [fats_g1a_08] and Value Added in Foreign Controlled Enterprises [egi_va1].

5.3 Employment and jobs

Employment

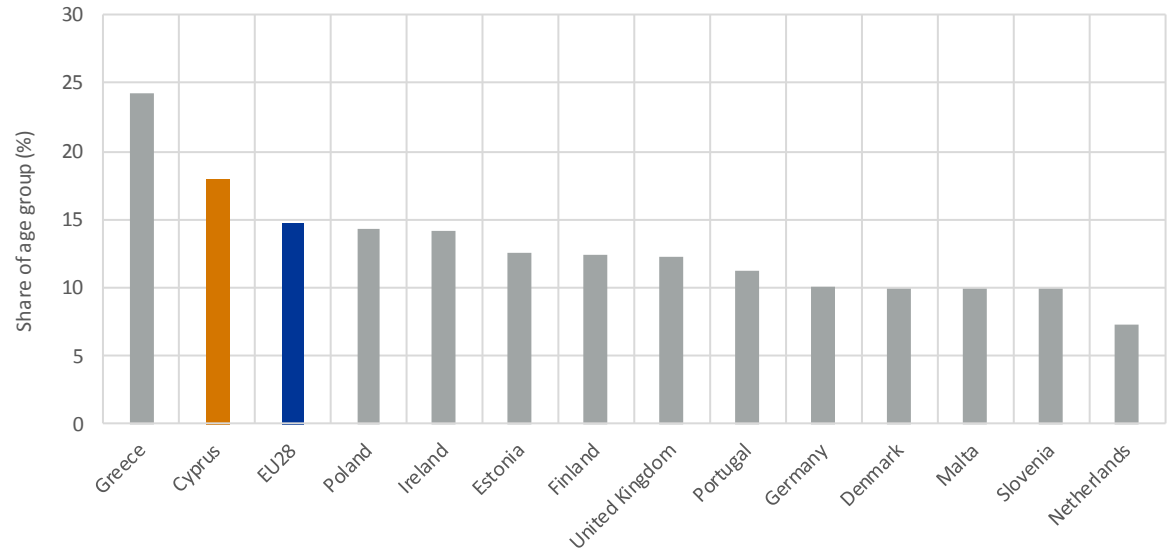
With less than 71 percent of the population aged 20 to 64 having employment, employment levels remain below pre-crisis levels and are relatively low compared to most benchmark countries. However, compared to 2014, the employment level has recovered, with its growth rate exceeding the growth rates of most benchmark countries in recent years. (Figure 52) Cyprus' low overall employment level is also reflected in a high rate of young people (aged 20 to 34) not in education, employment, or training (NEET). Along with Greece, Cyprus stands out among benchmark countries as having a NEET rate that is above the EU average. (Figure 53)

Figure 52 Employment levels, 2008- 2017



Source: Eurostat, Labour Force Survey [lfsi_emp_a]: Employment level and growth.

Figure 53 Youth not in education, employment or training (NEET), 2017



Source: Eurostat, Young people neither in employment nor in education and training by sex, age and labour status (NEET rates) [edat_lfse_20].

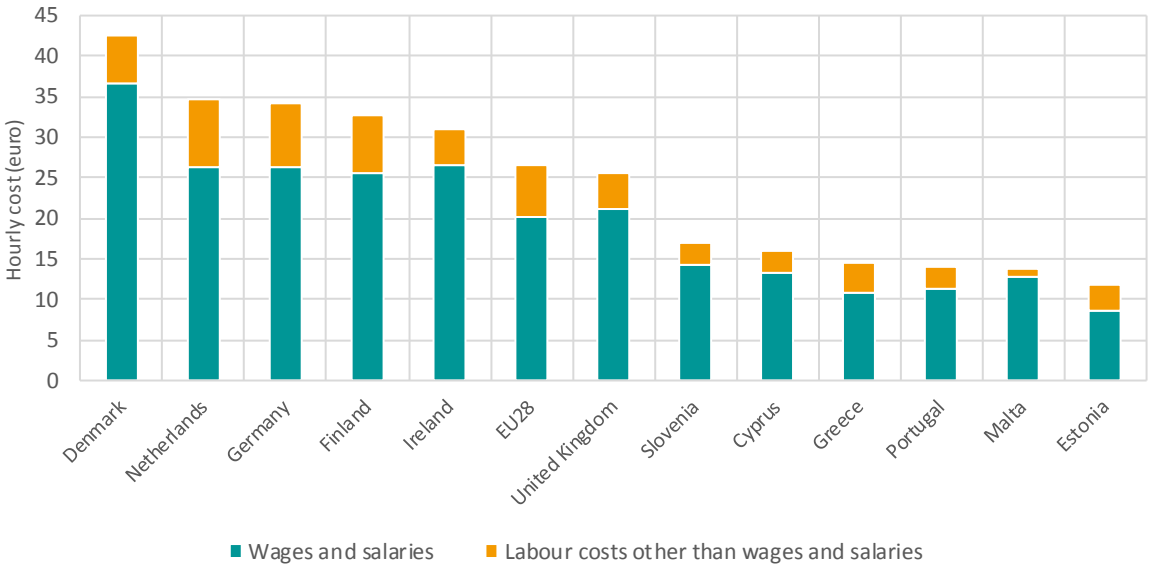
5.4 Costs and prices

Cost of labour

The cost of labour in Cyprus is relatively low. Net earnings are among the lowest of all benchmark countries and are significantly lower than the EU average. This is due not only to low wages and salaries, but also low non-wage costs. (Figure 54). This is reflected in a very low tax wedge on labour, which is significantly below all benchmark countries (see Figure 75 on page 83).

Although low labour costs can confer a cost competitiveness advantage to enterprises, they are potentially also symptomatic of low levels of productivity and imply lower levels of income and purchasing power of workers.

Figure 54 Labour costs and earnings, 2017

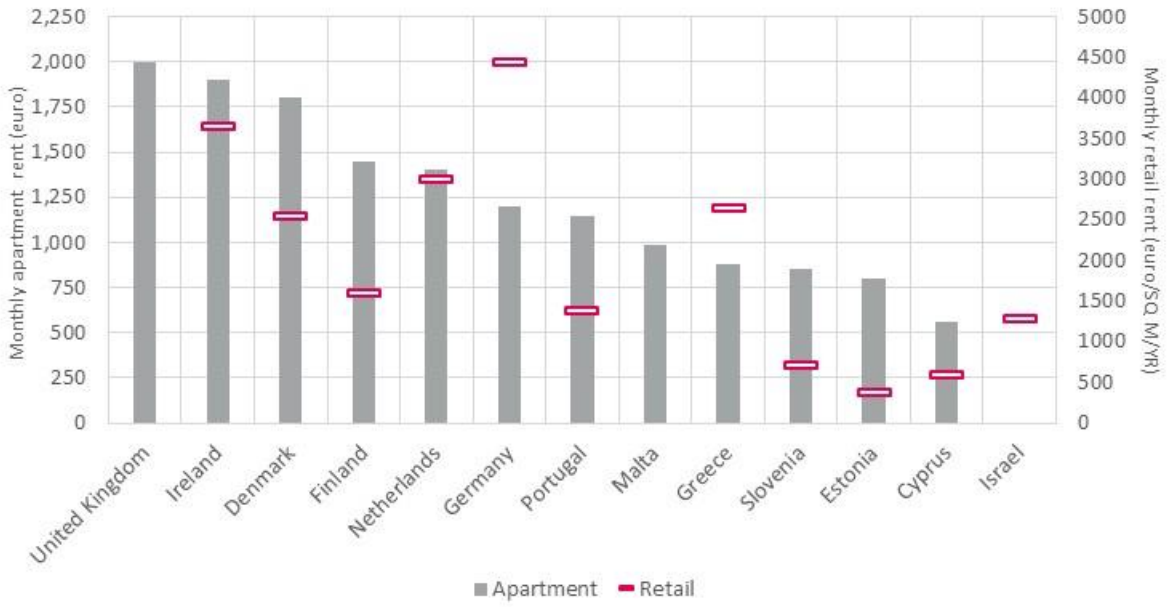


Source: Eurostat: Labour cost levels by NACE Rev. 2 activity [lc_lci_lev].

Real estate costs

The cost of real estate in Cyprus is low. Apartment and retail rents are among the lowest compared to benchmark countries. (Figure 55). Data on office rents are not available, but low commercial and residential rents would suggest that these are similarly low. As with labour costs, low rent costs can be viewed as a competitive advantage. However, they can also reflect low levels of business demand or limited purchasing power (disposable income) of households. The real estate market in Cyprus has also been reported to be relatively inefficient (European Commission, 2018a), while the World Bank Doing Business index gives Cyprus a low score for *Dealing with construction permits* and *Registering property*.

Figure 55 Rental prices for apartments and retail spaces, 2015 and 2017

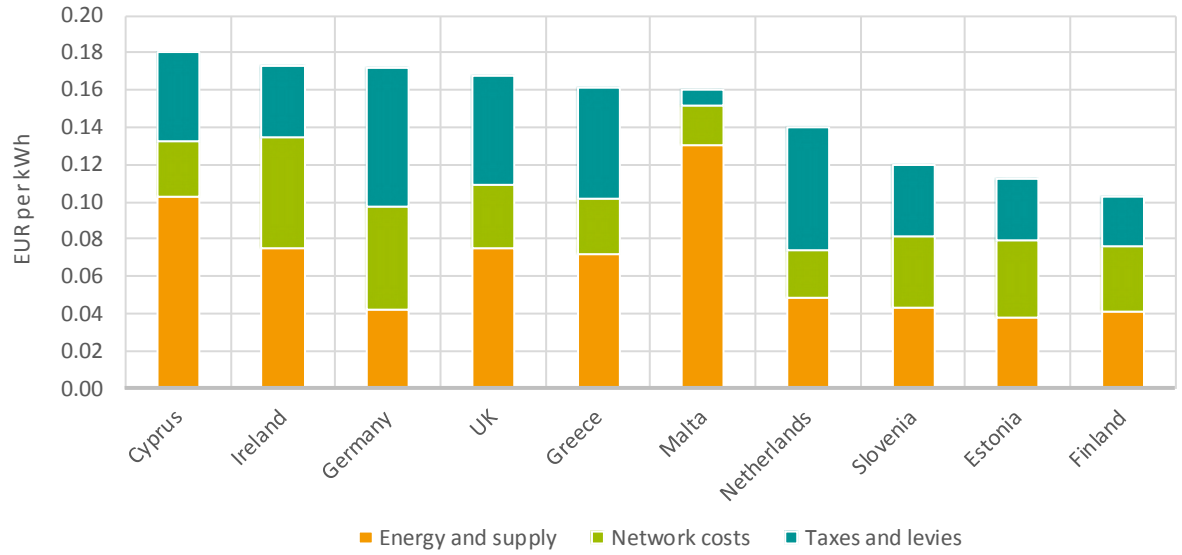


Source: Rental prices for apartments for 2017, for retail space for 2015.
Source: Eurostat, Estate Agency Rent Surveys (2017): *Rent for 2-bedroom flat* (http://ec.europa.eu/eurostat/web/civil-servants-remuneration/estate-agency-rent-surveys); Cushman & Wakefield (2016).

Electricity costs

Electricity for non-household customers in Cyprus is expensive, due to high energy and supply costs. Reasons include the small size of the country and the dependence on imports of fossil fuel for electricity generation. (Figure 56)

Figure 56 Electricity price components, 2017

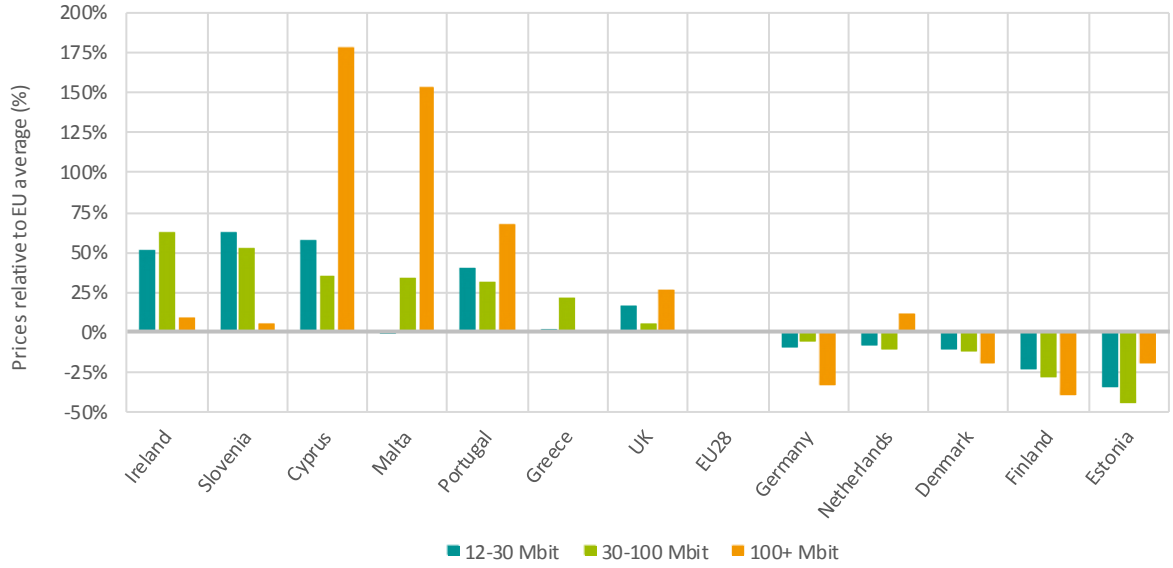


Source: Eurostat: Electricity prices components for non-household consumers [nrg_pc_205_c].

Broadband costs

Broadband prices are higher than in most benchmark countries, particularly for speeds above 100 Mbit per second. (Figure 57) However, the price premium is only slightly above the EU average for triple play offers in the 30 to 100 Mbit range (European Commission, 2017a). This matters, as internet usage in Cyprus is low due to a lack of take-up. An explanation for the high cost is a lack of competition, with the small market size limiting the number of providers (European Commission, 2017c).

Figure 57 Fixed broadband prices, 2016



Source: European Commission (2017a), Fixed Broadband Prices in Europe 2016. *prices compared with EU average (singlepay).*

6 Benchmark of institutional & organisational competitiveness drivers

Institutional and organisational competitiveness drivers are those factors that affect the environment in which enterprises and economic sectors operate. This also includes those factors that relate directly to the structure, conduct and performance (in terms of production efficiency and innovation) of enterprises and economic sectors. These are grouped into four themes: (1) market conditions and institutions, (2) business environment and institutions, (3) industry structure, specialisation and organisation, and (4) firm characteristics, dynamism and sophistication.

Market conditions and institutions refers to how well markets function and how well they are supported by institutions. *Business environment and institutions* refers to the legal, administrative and regulatory environment for businesses. *Industry structure, specialisation and organisation* refers to the structure of the economy, the goods and services that are produced, and how specialised or diversified the economy is. This theme also covers how production is organised, for example in value chains or in clusters, and whether intermediate inputs can be sourced domestically. *Firm characteristics, dynamism & sophistication* refers to the size and structure of firms; enterprise dynamism (such as new business creation and high growth enterprises); the extent of entrepreneurship and entrepreneurial attitudes; and the sophistication of businesses and management quality.

6.1 Market conditions & institutions

Market conditions and institutions refers to how well markets function and how they are supported by market institutions. This includes how well competition functions for products, services, and employees in both foreign and domestic markets as well as the regulatory conditions affecting these markets. Given the importance of capital markets and the importance of financial services for the Cyprus economy, conditions in capital markets are covered separately under the theme *Financial market development*.

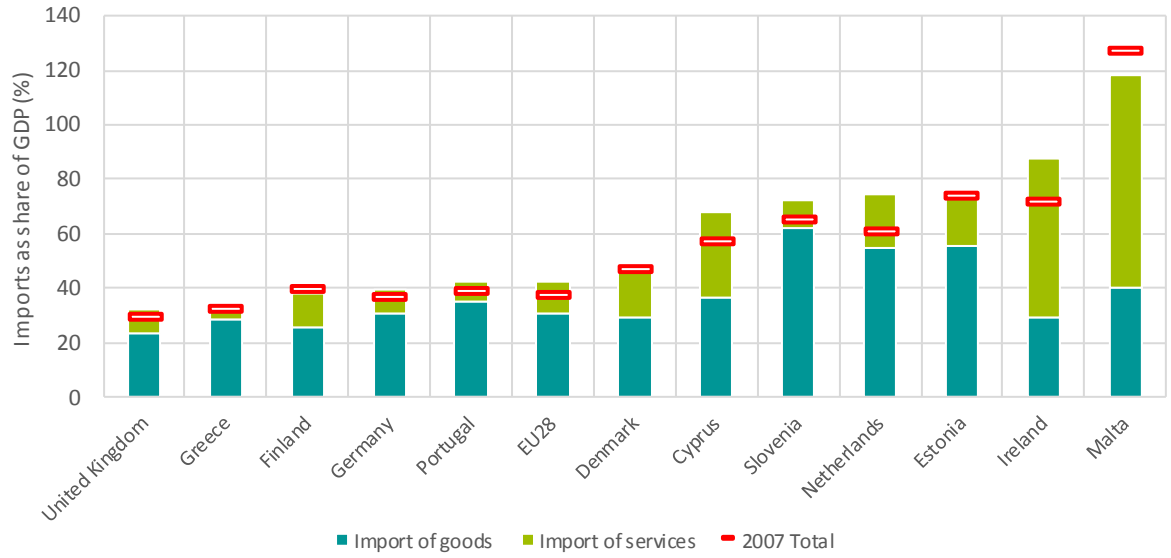
Although a good range of indicators on market conditions and institutions is available for Cyprus, it is unfortunate that a number of useful OECD indices are unavailable: these include the OECD Service Trade Restrictiveness index, which covers barriers to trade in services, the OECD Product Market Regulation index, which covers economy-wide and sectoral regulation and competition, and the OECD Indicators of Employment Protection, which cover the strictness of labour market regulation.

Trade openness

In common with other smaller EU economies, Cyprus displays a high degree of trade openness as measured by imports of goods and services as a share of GDP. In 2017, Cyprus' imports of goods and services were equivalent to 68 percent of GDP, slightly below the corresponding levels for Estonia and Slovenia, but some way behind Ireland and especially Malta, with imports corresponding to nearly 120 percent of total GDP.[7] The relative position of Cyprus appears different if only imports coming from outside the EU are considered, with Cyprus remaining far behind Malta but ahead of most other small EU economies, including Estonia and Slovenia. (Figure 58, Figure 59 and Figure 60)

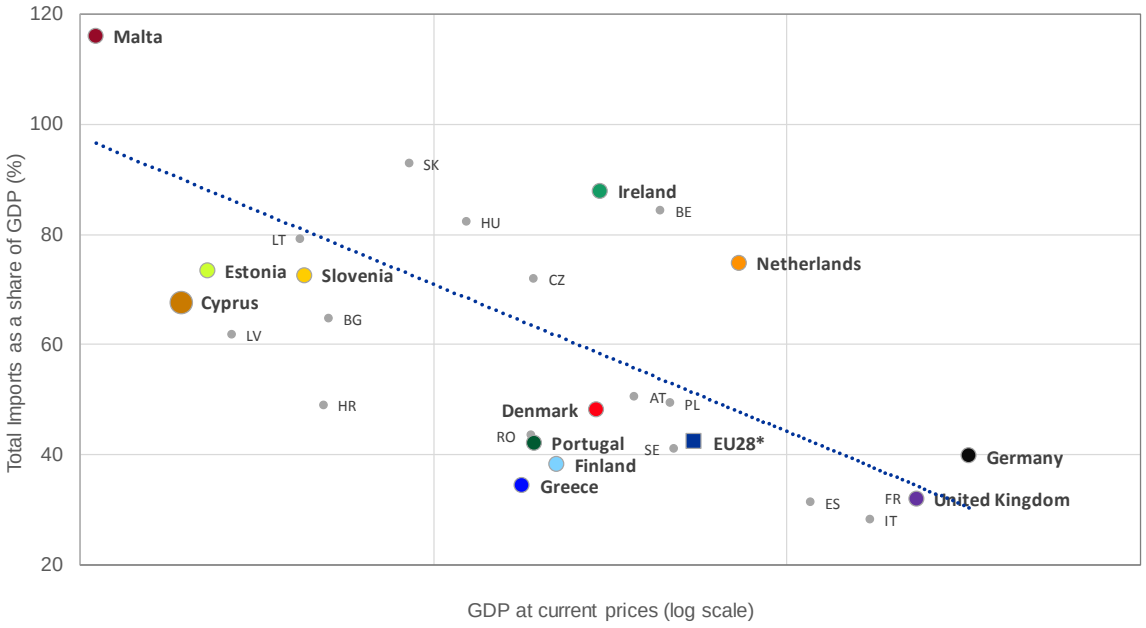
[7] Imports and exports close or above 100 percent of total GDP can be explained by re-exports, with goods passing through the ports and airports of a country, from one third country to another third country.

Figure 58 Imports of goods and services, 2007 and 2017



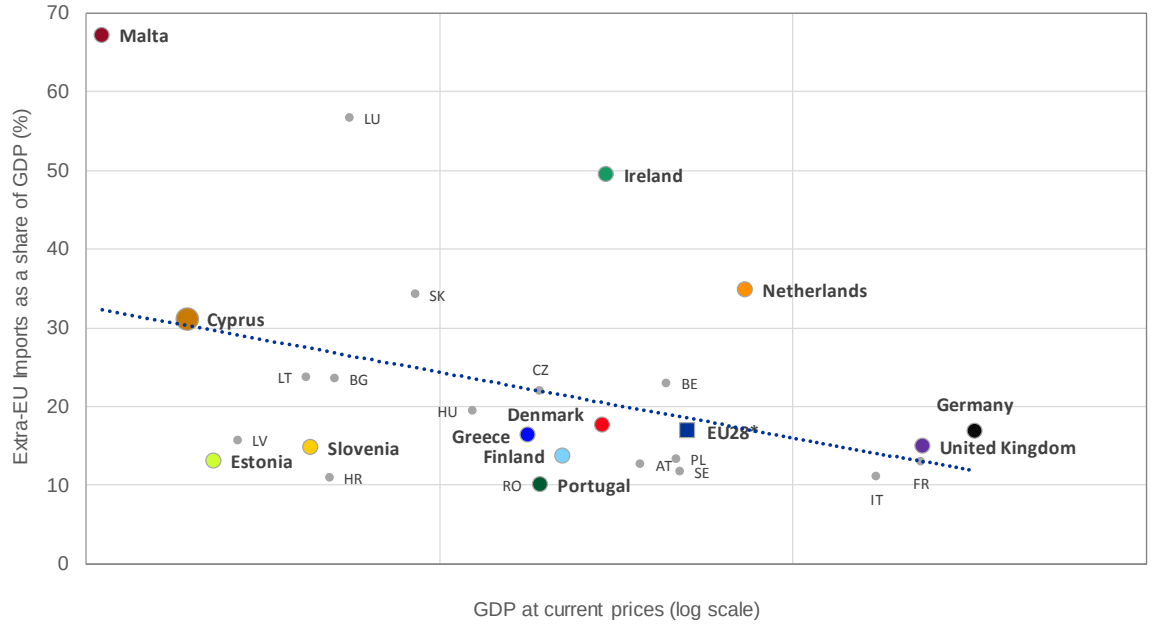
Source: Eurostat, GDP and main components (output, expenditure and income) [nama_10_gdp].

Figure 59 Trade Openness: Total imports of goods and services compared to level of Gross Domestic Product, 2017



Notes: EU28* based on arithmetic mean GDP of EU Member States and total EU imports (intra and extra-EU) of goods and service as a share of total EU GDP. Luxembourg not shown.
Source: Eurostat, National Accounts (nama_10_gdp and nama_10_exi).

Figure 60 Trade Openness: Extra-EU imports of goods and services compared to level of Gross Domestic Product, 2017



Notes: EU28* based on arithmetic mean GDP of EU Member States and total EU imports (extra-EU) of goods and service as a share of total EU GDP.
Source: Eurostat, National Accounts (nama_10_gdp and nama_10_exi).

Ease of trade

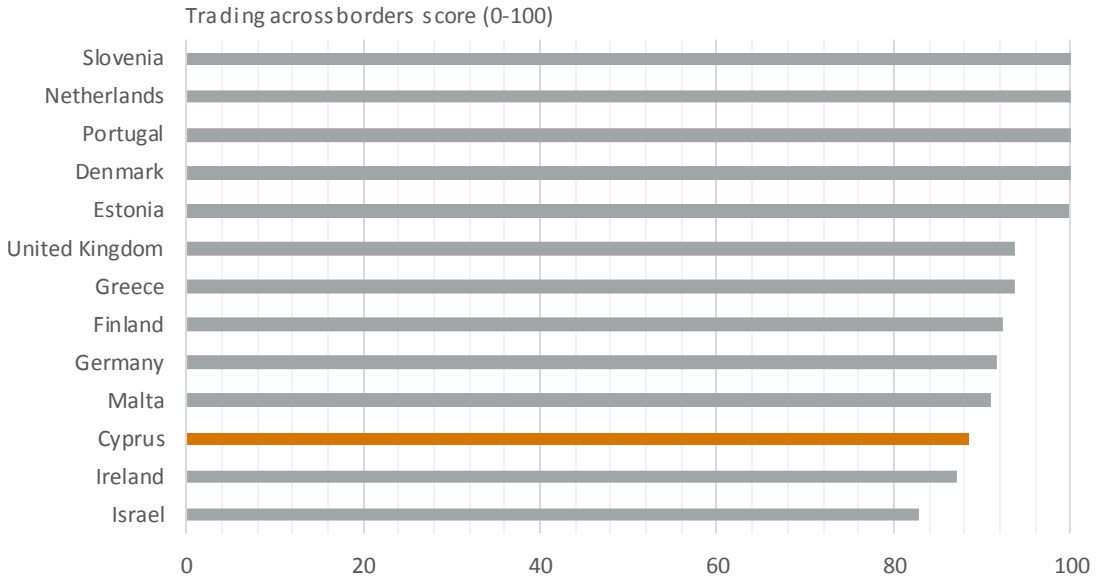
Given Cyprus' openness to trade, particularly for extra-EU imports of goods and services, its weak performance in relation to certain trade facilitation indicators may be a cause for concern. In terms of the time and cost (excluding tariffs) associated with exporting or importing a shipment of goods, the World Bank *Trading Across Borders* index (part of the broader Doing Business ranking) places Cyprus below the average for high-income countries and behind most of the benchmark countries considered in this report, except Ireland and Israel. Similarly, the World Economic Forum's Executive Opinion Survey rates Cyprus low in terms of the efficiency of its customs procedures. (Figure 61 and Figure 62)

The above findings suggest that there may be room for Cyprus to improve trade-related procedures. At the same time, the available indicators are primarily concerned with trade in goods and do not capture the situation for services in trade, which is potentially of greater relevance given the orientation of Cyprus' economy towards the services sector.

Description: Trading across borders index

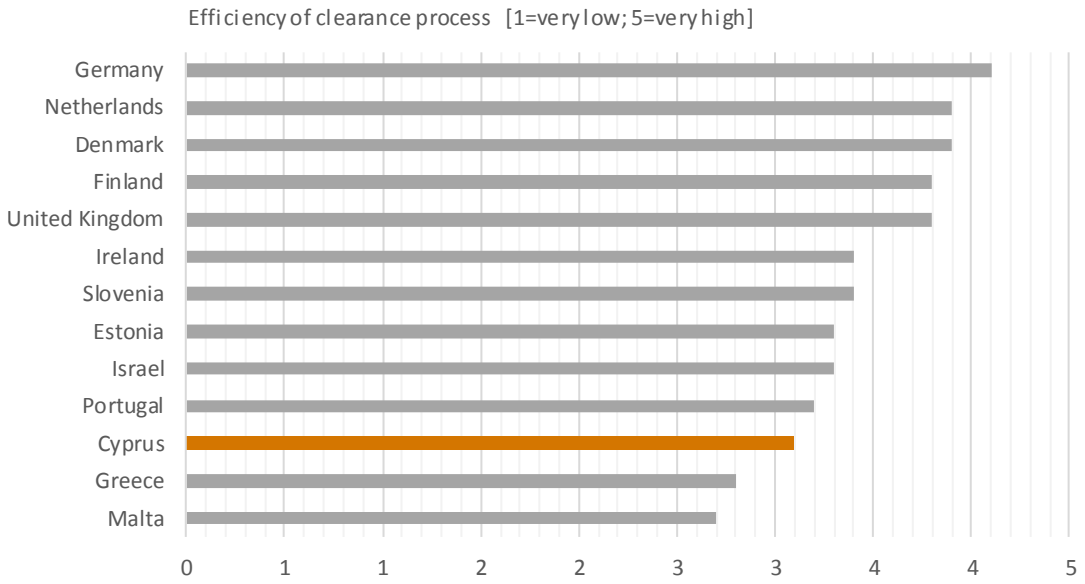
The *Trading Across Borders* index estimates the time and cost (excluding tariffs) associated with three sets of trade procedures—documentary compliance, border compliance and domestic transport—within the overall process of exporting or importing a standardised shipment of goods. The Index is scaled from 0 to 100, where '0' represents the lowest performance and '100' corresponds to the best, or 'frontier', performance. The *Trading across borders index* is a sub-index of the World Bank Doing Business ranking.

Figure 61 Trading across borders index, 2018



Source: World Bank, Doing Business: *Trading Across Borders, 2019.*

Figure 62 Customs efficiency, 2018



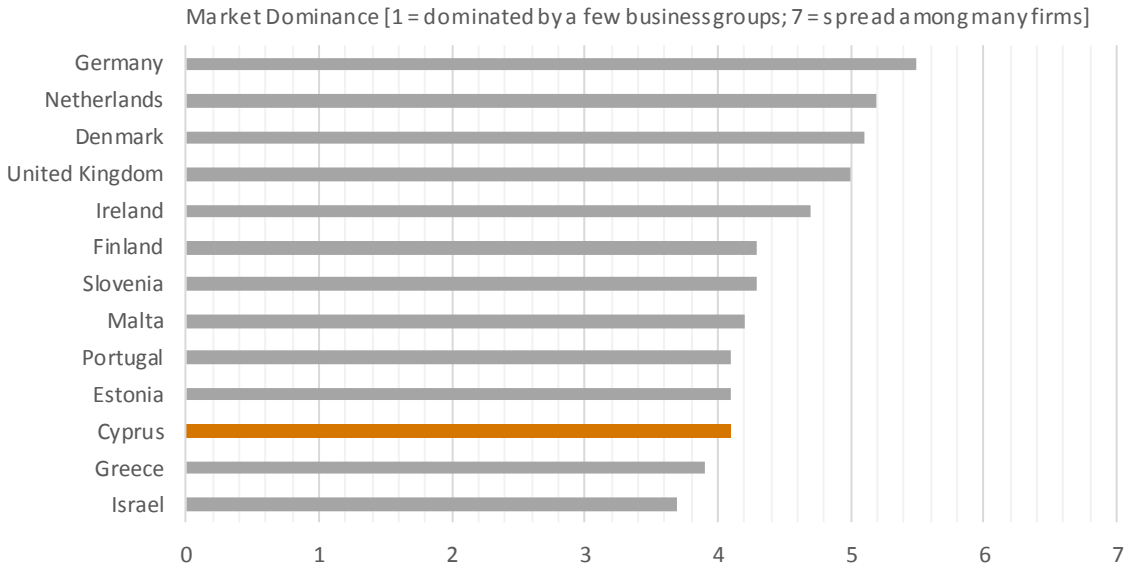
Source: World Economic Forum, Executive Opinion Survey: *Burden of Customs Procedures, 2018.*

Product market competition

Indicators related to domestic market competition from the World Economic Forum Executive Opinion Survey suggest that general market competition conditions in Cyprus are broadly comparable to those in the other small benchmark countries. Cyprus is rated in the middle of the distribution of perceptions of the intensity of market competition, for which there is relatively limited variation across the benchmark countries.[8] Similarly, among benchmark countries, although Cyprus only scores better than Greece and Israel, when compared to other smaller benchmarking countries, there does not seem to be any evidence to suggest that markets in Cyprus suffer from high levels of dominance by a few business groups. (Figure 63).

[8] See *Goods market efficiency* (Figure 33 on page 47) and *Product market* (Figure 34 on page 48).

Figure 63 Market dominance, 2018



Source: World Economic Forum, *The Global Competitiveness Report,* 2018.

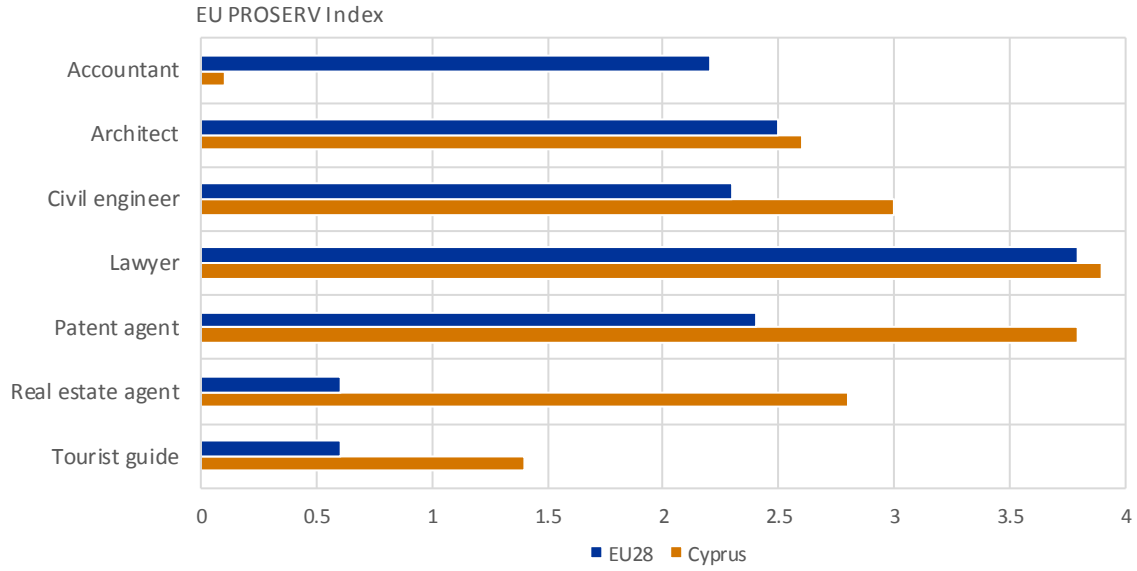
Regulation of professional services

Restrictive regulation of professional services is high for most professions, but comparable to the EU average. Exceptions include the accounting profession, which seems to be subject to very limited regulation. Conversely, tourist guides and real estate agents seem to be more heavily regulated in Cyprus compared to the EU average. Despite these outliers, the restrictiveness of professional services is broadly comparable to the EU average. (Figure 64)

Description: Product Market regulation indicators for services

The Restrictiveness Indicator for Professional Services (PRO-SERV) focusses on the regulation (exclusions, restrictions and requirements) on the establishment and exercise of professional service providers in seven professions for EU Member States. The PRO-SERV indicator is scaled from zero to six.

Figure 64 Market regulation for professional services, 2016



Source: European Commission (2016).

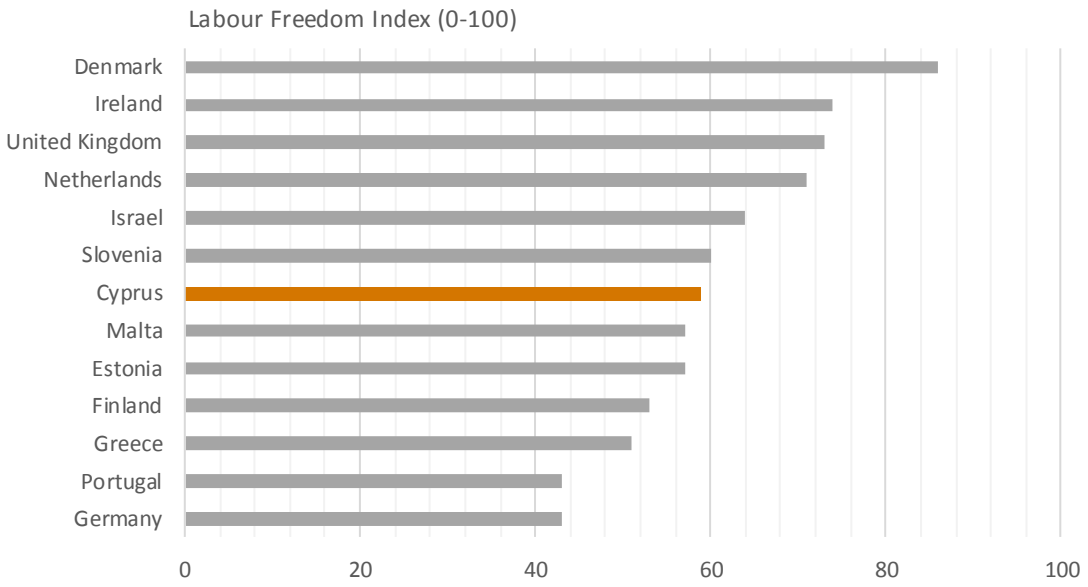
Labour market flexibility

The Labour Freedom index by the Heritage Foundation ranks Cyprus in the middle of all benchmark countries. This index ranks countries higher that have less labour market regulation. This complicates the interpretation of the index as less market regulation does not necessarily imply improved competitiveness. While less labour market regulation might reduce the burden faced by firms, it might also mean less social stability and cohesion, or less committed and motivated workers. Furthermore, less labour market regulations such as the absence of employment protection might also reduce the workers' quality of life. In this sense, the middle position of Cyprus may indicate a healthy balance between protecting workers and serving the interests of firms. Or, as noted by the Heritage Foundation, "relatively flexible labour regulations facilitate employment and productivity growth, (but) union power is quite strong." (Figure 65)

Description: Labour Freedom Index

The Heritage Foundation's Labour Freedom Index is a composite index that measures various aspects of the legal and regulatory framework of a country's labour market. It includes six equally weighted factors: the ratio of the minimum wage to the average value-added per worker, the hindrance to hiring additional workers, the rigidity of hours, the difficulty of firing redundant employees, legally mandated notice period, and mandatory severance pay.

Figure 65 Labour Freedom Index, 2017

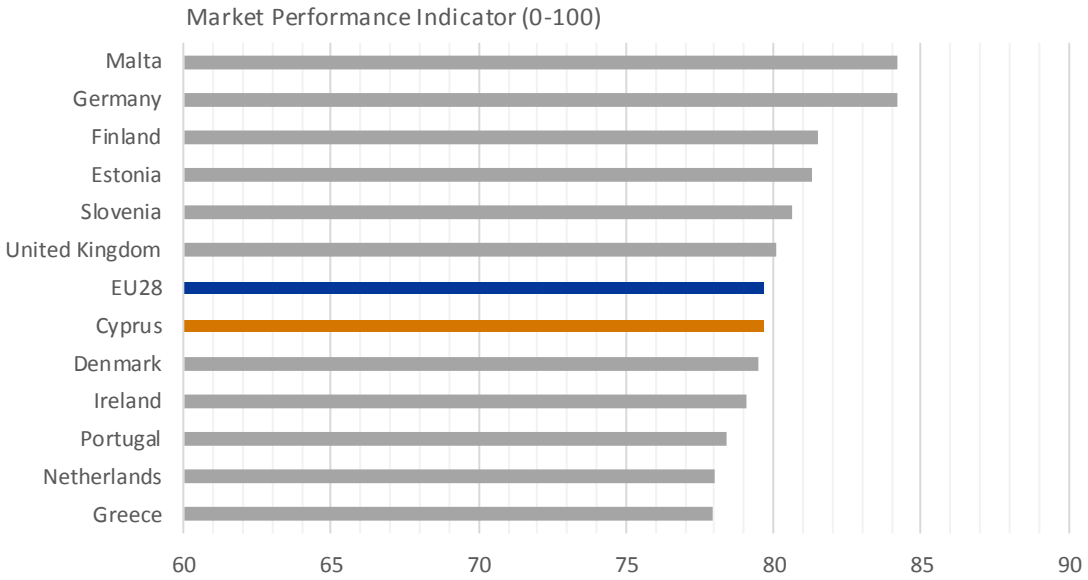


Source: The Heritage Foundation, Labor Freedom Index.

Consumer market functioning

The Consumer Market Monitoring Survey by the European Commission assesses consumer markets, with Cyprus being comparable to the EU average (Figure 66). Notwithstanding the usual methodological issues with perception surveys, this would indicate that consumer markets in Cyprus work reasonably well. The survey finds only limited variation in the performance of markets for specific goods. In service markets, consumers perceive the performance of financial-service providers as particularly weak, which generally illustrates the problematic state of the banking and financial sector. In contrast, markets related to the tourism industry, such as hotels and restaurants or aviation, are perceived well above the average.

Figure 66 Consumer Market Performance, 2015



Notes: The Consumer Market Monitoring Survey 2016 edition is based on information collected in 2015.
Source: European Commission, Consumer Market Monitoring Survey (2016): *Average Market Performance Indicator.*

Description: Consumer Market Performance index

The Consumer Market Performance Index from the European Commission is based on citizen's perception of the performance of key consumer goods and services markets. The index includes five main factors determining market performance: ease with which goods and services can be compared, level of trust towards retailers, extent to which markets live up to what consumers expect, number of retailers (and thus choice in the market), and incidence and severity of problems encountered by consumers. For some consumer markets, two additional indicators are considered: the consumer's propensity to complain in response to problems and the incidence of switching tariffs or providers in selected service markets.

6.2 Business environment & institutions

Business environment and institutions refers to the legal, administrative and regulatory environment for businesses.[9] The business environment includes the efficiency of the public administration, the quality of institutions, the ease of doing business, the quality of property rights, or the efficiency and attractiveness of taxation. The foundations of the business environment are legal accountability and an equal, fair and independent legal system, combined with political stability and respect of property rights. These fundamental rights are all guaranteed by the constitution of Cyprus and the EU charter of fundamental rights. Furthermore, Cyprus is a stable democracy, as evidenced by the resilience of its political system in the face of the fiscal and banking crisis, which represented a major economic and social shock.

It is a challenge to quantitatively measure the business environment, given the complexity of institutions and regulations. The World Bank Doing Business Index is among the most popularly used business-environment indicators, but it is also relatively narrow in scope, looking at very specific and standardized situations. This is a strength, as it allows meaningful comparisons across countries. However, it is also a weakness as it only cap-

[9] A distinction is made between 'Market conditions & institutions', which is concerned with how the regulatory environment affects the functioning of specific markets, and 'Business environment and institutions', which is concerned with the institutional environment as it affects the performance of individual firms, regardless of the market it operates in.

tures selected aspects of the business environment. We thus complement the Doing Business indicator with other indicators.

Ease of Doing Business

Although Cyprus is found to have a reasonably effective government, there are certain challenges for the regulatory and administrative regime. The World Bank Doing Business Index ranks Cyprus 57th out of 190 countries, below most benchmark countries, including the top performers Denmark, the UK, Estonia and Finland. (Figure 67)

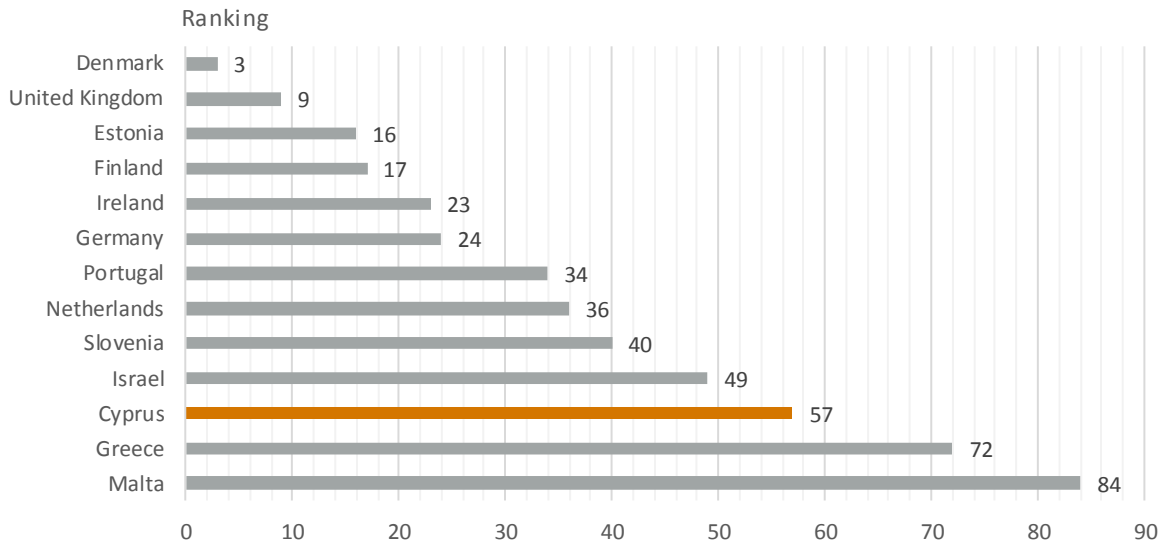
However, there is considerable variation within the Doing Business indicator, with Cyprus performing well in resolving insolvency, paying taxes and protecting investors. Cyprus performs less well in enforcing contracts or dealing with construction permits. This variation suggests that Cyprus does not suffer from systematic weakness across all areas. Rather, the variation suggests that there are specific areas that call for focussed attention. (Figure 68)

The Cyprus government is actively and systematically addressing challenges to the ease of doing business in the country, specifically within the Action Plan for Growth. This has, for example, brought significant improvements to the insolvency framework. Remaining issues relate mainly to insolvency services as well as the effectiveness of the judiciary system, but even these are being addressed (see below in the sub-section 'Justice').

Description: Ease of Doing Business sub-indicator score

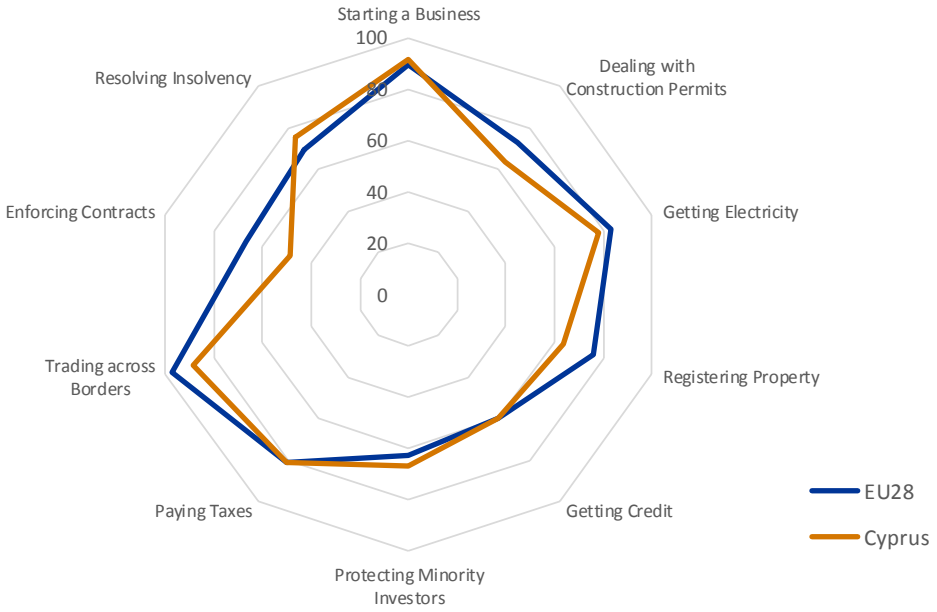
The Ease of Doing Business Score indicates the performance for a sub-indicator using a scale from 0 to 100, where 0 represents the lowest performance and 100 the best regulatory practice across all economies and across time. Higher scores show absolute better ease of doing business (the best score is set at 100).

Figure 67 Ease of Doing Business, 2018



Notes: The Doing Business Report of 2019 covers 190 economies.
Source: World Bank, Doing Business Report 2019.

Figure 68 Ease of Doing Business sub-indicator scores, 2018



Source: World Bank, Doing Business Report 2018.

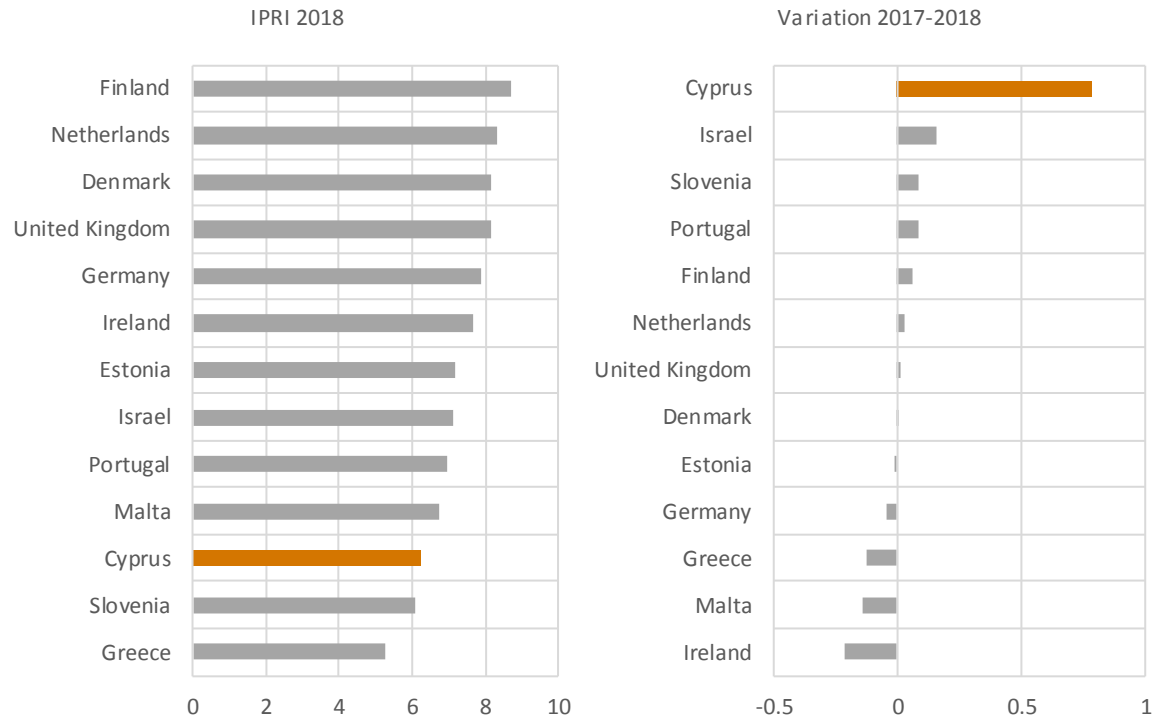
Property and other legal rights

The International Property Rights Index ranks Cyprus below most benchmark countries. This reflects, in part, the selection of benchmark countries, all of which are stable democracies that guarantee fundamental legal rights, embedded in an independent judiciary and recognised property rights.[10] However, compared to the benchmark countries, Cyprus scores relatively weakly for property rights, including intellectual property rights and copyright protection. (Figure 69 and Figure 70).

Significant efforts are underway to improve property rights protection in Cyprus, and significant improvements have been noted in the Intellectual Property Rights Index between 2017 and 2018, with Cyprus being the fifth most-improved economy in the index for intellectual property rights for all countries and the most-improved of the benchmark countries. (Figure 69) The current Cypriot legislation on intellectual property rights and copyrights, which is fully harmonised with all relevant and applicable EU Directives and Regulations, provides a high level of protection. Additionally, Cyprus is in the process of modernising the legislation on trademarks with the aim of harmonising with the latest Trade Marks Directive.

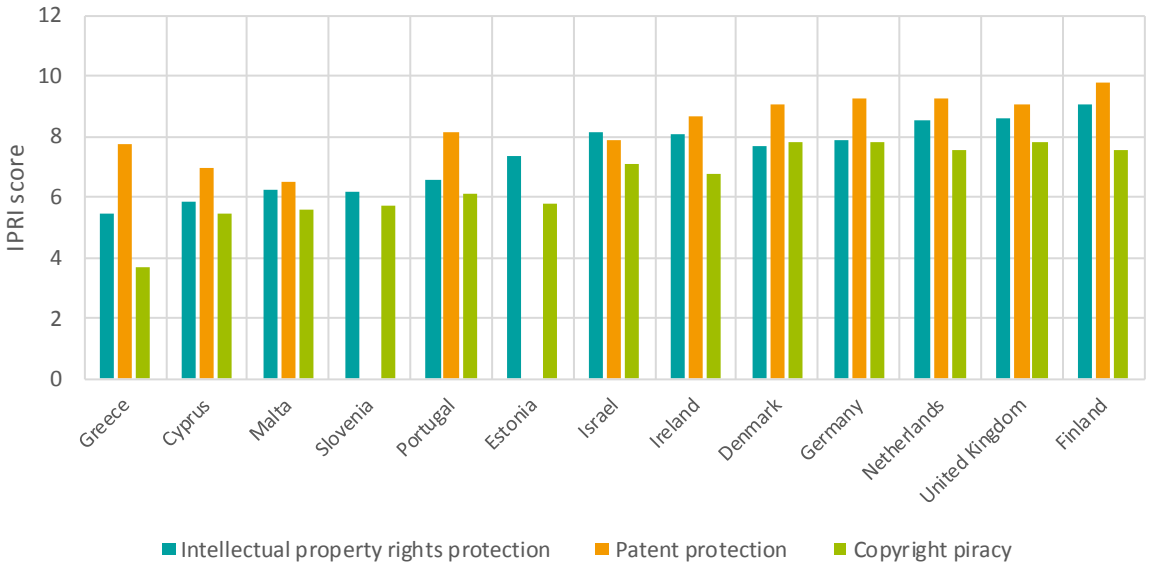
[10] Cyprus performs below the average of the benchmark countries for the sub-indicator judicial independence. This sub-indicator is from the World Economic Forum executive opinion survey, asking respondents for their opinion on the independence of the judicial system. But these responses might be heavily influenced by the lack of efficiency in the judicial system, confounding it with a lack of judicial independence.

Figure 69 International property rights index, 2018



Note: 125 countries are assessed by the index
Source: Property Rights Alliance, International Property Rights Report 2018

Figure 70 Property rights components, 2018

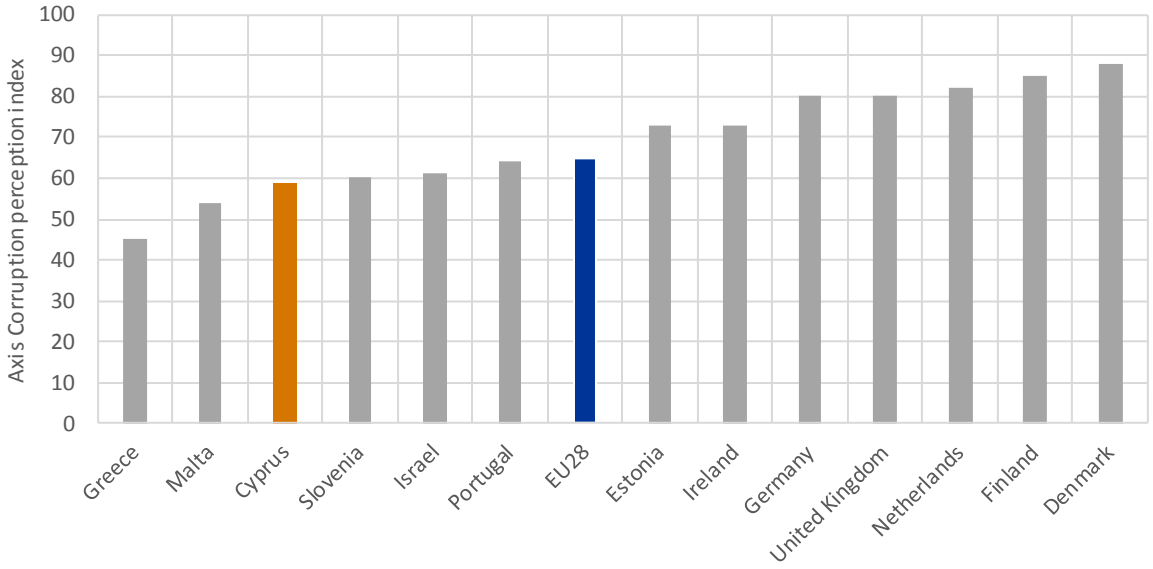


Notes: The overall grading scale of the IPRI ranges from [0 – 10], where 10 is the highest value for a property rights system and 0 is the lowest value (i.e. most negative) for a property rights system within a country.
Source: Property Rights Alliance, International Property Rights Report 2018.

Corruption

The Transparency International Corruption Perception Index locates Cyprus below most benchmark countries, although not far behind the EU average. Cyprus is positioned slightly ahead of Malta and substantially ahead of Greece. (Figure 71)

Figure 71 Corruption Perception, 2018



Note: The Corruption Perception Index gives countries a score ranging from 0 (highly corrupt) to 100 (very clean).
Source: Transparency International, Corruption Perception Index 2018.

Performance of public institutions

The effectiveness of government institutions in Cyprus is perceived as being below most benchmark countries. Worse are only Greece, and for the sub-indicator government efficiency, Malta and Portugal. The gap is particularly pronounced compared to the best performers in Northern and Western Europe. (Figure 72)

Cyprus performs relatively weak in e-Government development, with a low score for e-Government services and infrastructure and for e-Participation. (Figure 73)

Description: Government Effectiveness and Efficiency

Government effectiveness measures the quality of public services; the quality of the civil service and its independence; the quality of policy formulation and implementation; and the credibility of the government's commitment to such policies. It is based on a variety of existing indicators.

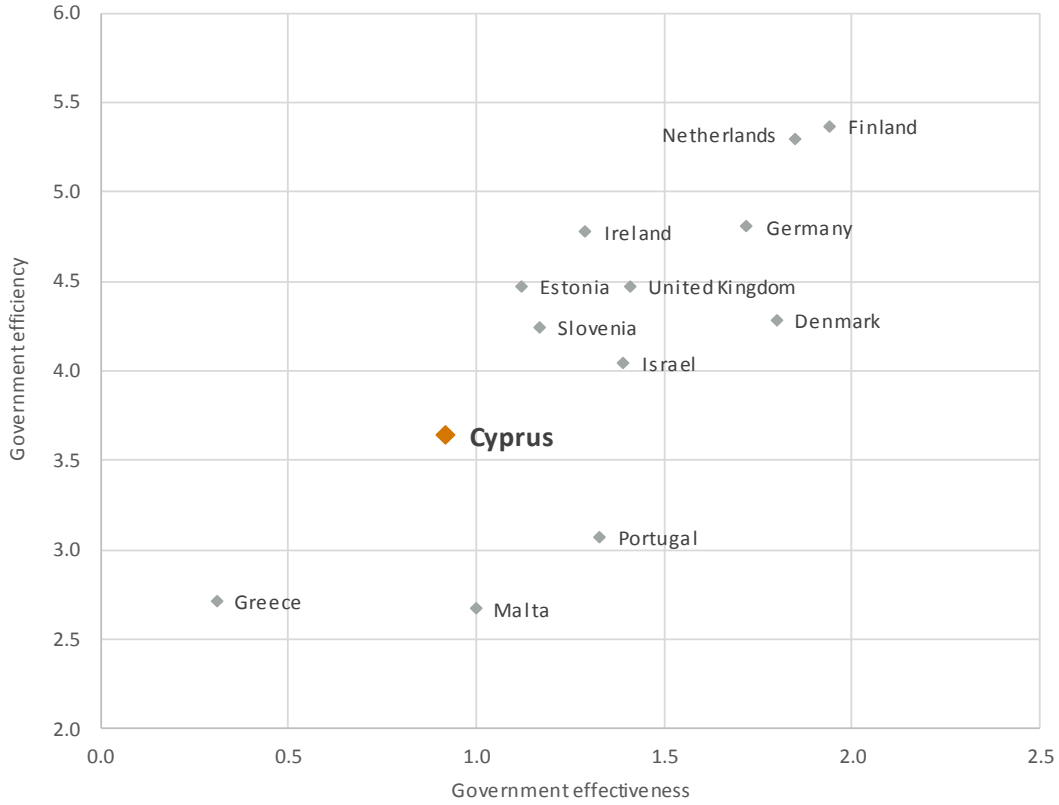
Government efficiency is taken from the World Economic Forum's indicator on the efficiency of government spending.

Description: United Nations E-Government indices

E-Government Development Index (EDGI) rates the performance of national governments based on the average of three indices: Online Service Index, Telecommunication Index and Human Capital Index (each with a possible value between zero and one);

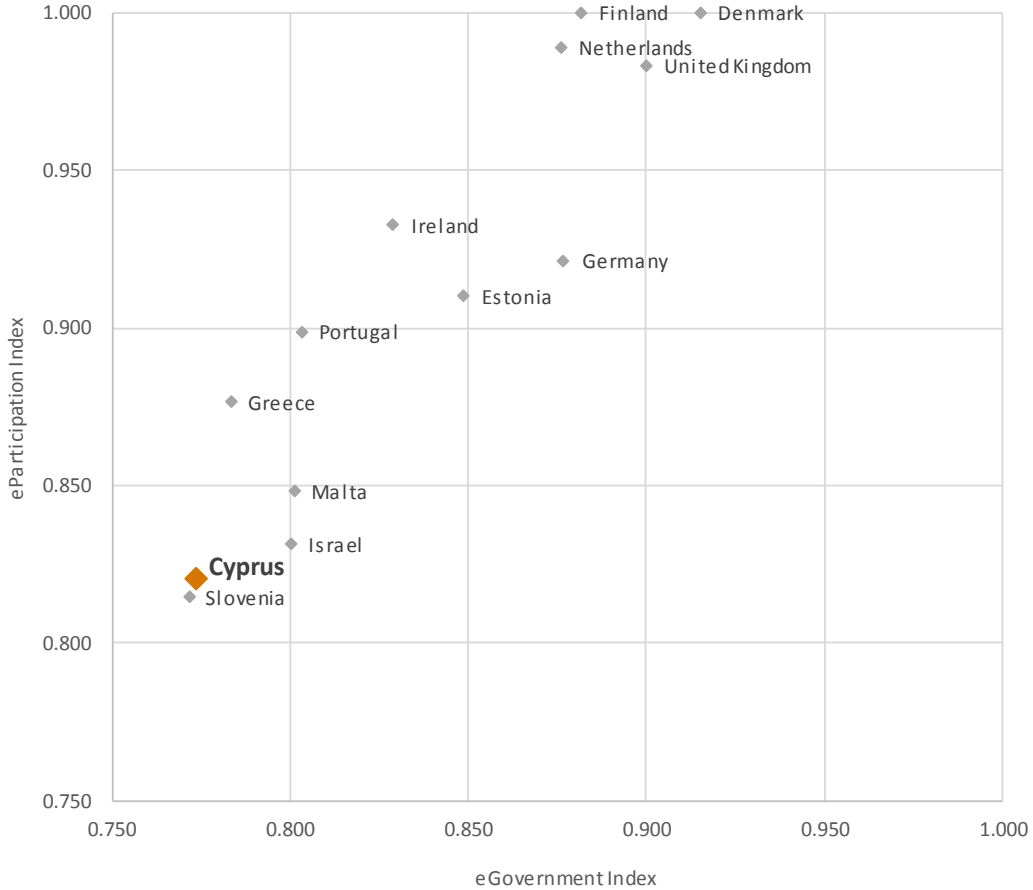
E-Participation Index (EPI) rates citizens' informative and participatory services and facilities (with a possible value between zero and one).

Figure 72 Government effectiveness and efficiency, 2017



Notes: Efficiency coring based on the question: In your country, how efficiently does the government spend public revenue?
Source: Worldwide Governance Indicators, Government Effectiveness; WEF executive opinion survey, 1.08 Wastefulness of Government Spending.

Figure 73 E-Government and e-Participation, 2018



Source: United Nations, e-Government Survey 2018. EDGI and EPI.

Taxation

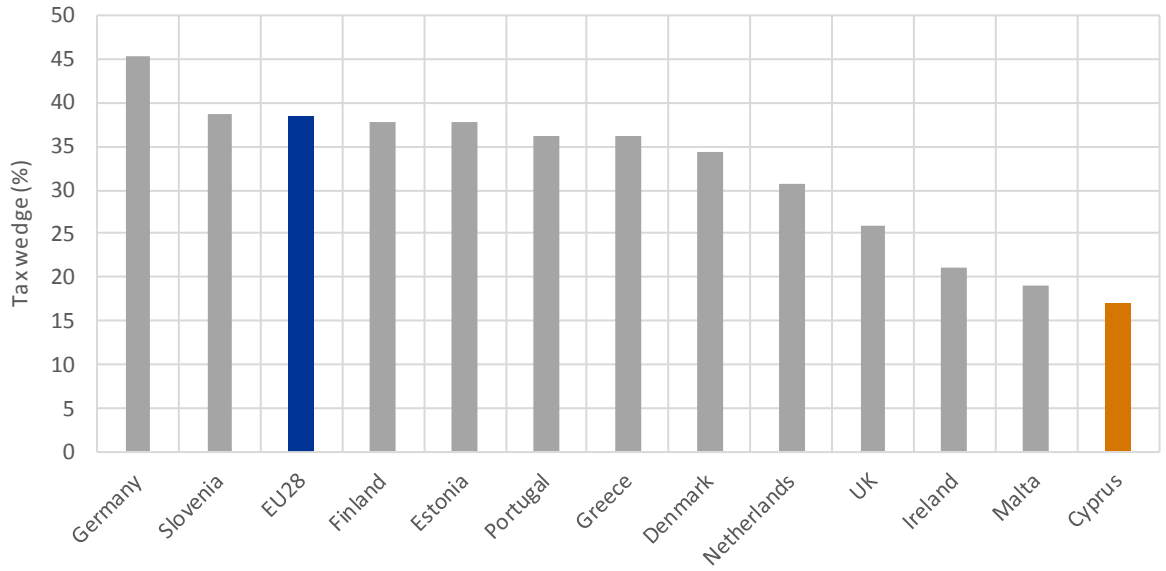
Tax rates in Cyprus are favourable. Cyprus and Ireland have significantly lower corporate tax rates than the other benchmark countries. In contrast, the value-added tax (VAT) rate is comparable to other benchmark countries. (Figure 74) Furthermore, the tax wedge on labour income in Cyprus is the lowest among the benchmark countries. (Figure 75)

A low tax regime—in combination with low wage rates and low non-wage costs for labour (Figure 54 on page 69)—contributes to reducing the cost burden on businesses and enhances the attractiveness of Cyprus as an FDI destination.

Figure 74 Tax rates, 2017

Source: KPMG, Tax Tools 2017; European Commission DG Taxation and Customs Union, Taxation Trends in the European Union Report 2017; and Israel Ministry of Finance Tax Authority (retrieved from Trading Economics, 2017).

Figure 75 Tax wedge on labour, 2016



Notes Data for Malta from 2015. The tax wedge is defined as the percentage difference between the amount of taxes paid by an average worker (single, without children) and the total labour cost for the employer.

Source: Eurostat, Tax wedge on labour costs [earn_nt_taxwedge] and IMF (2017).

Justice

The efficiency, quality and independence of the justice system is an important contributor to the business environment. While the independence and quality of justice delivery in Cyprus is considered to be high, the situation is not the same regarding the time needed to conclude civil cases. The time needed to resolve cases is between two and three years on average, placing Cyprus among the worst performers. (Figure 76) There is also a significant backlog, with the clearance rates being below 100 percent in most years for civil, commercial, administrative, and other cases. (Figure 77) At the same time, Cyprus spends relatively less—as a share of GDP—on the judicial system and has relatively fewer judges relative to population size. (Figure 78) Furthermore, the justice system has not adopted ICT in its processes and procedures, marking it out from all other benchmark countries for which data are available, which adversely affects the operations and efficiency of the system. (Figure 79)

One principal cause of delays and backlogs, which has hampered the effectiveness of measures taken by the Government to reinforce the judicial system, is the increase in the workload of the courts due to the global financial and economic crisis and the domestic fiscal and banking crisis. Since 2010, there has been a sharp increase in the number of civil cases filed, including appeals, related mostly to the financial sector. These cases are complex and do not lend themselves to speedy disposition.

The issues facing the judicial system have been recognised by the government, with justice being identified as a priority area for reforms. A functional review of the court system has already marked-out several areas for reform, providing recommendations on management structure, case management, judicial time management, judicial training, and alternative dispute resolution procedures. The measures being taken are outlined in the Box below.

Justice System Reform in Cyprus

Acknowledging the need to resolve civil cases more efficiently, the Government of Cyprus has prioritised the reform of the Justice System. The Ministry of Justice and Public Order, in close collaboration with the Judiciary and the Ministry of Finance, has embarked on a major reform programme which includes:

- Establishment of the Administrative Court (January 2016) taking all first instance administrative recourses, thereby enabling the Supreme Court to carry out more expeditiously its second instance jurisdiction.
- Enactment of the Courts of Justice (amendment) Law in July 2017, providing for the filtering of the right to file an appeal in civil cases as regards to interlocutory decisions during the proceedings.
- Enactment of the Law for the Establishment and Operation of the Administrative Court of International Protection in July 2018. The new court will enable the Administrative Court to have more time to deal with all other administrative cases.
- Preparation of a bill to establish a Commercial Court.
- Launch of a tender to digitize the operations of the Courts. E-Justice is considered one of the main pillars for the reform of the Justice system.
- Undertaking a functional review of the Cyprus Courts System (completed in March 2018). Based on the study's recommendations, a detailed action plan has been prepared for judicial reform, which is regularly updated. Implementation is currently ongoing.
- Appointment of a taskforce of judges to tackle the backlog of cases, including specific judges for the handling of financial disputes and supporting administrative staff, the development of a "mini" electronic registry and the assigning of case management judges.
- Undertaking a review of Civil Procedure Rules. A progress report was submitted by the relevant experts in May 2018 and the final set of rules are expected to be submitted by the experts in June 2019.

- Preparation of a bill amending the Civil Procedure Law, to strengthen the legal framework for the enforcement of judgments.
- Implementation of studies concerning mediation, establishment of a training school for judges within the Supreme Court in Cyprus and introduction of digital audio recording of court proceedings.
- Other projects in the reform programme include the enhancement of the administrative capacity of the Courts, the establishment of criteria for the appointment and evaluation of judges, and the separation of jurisdiction of the Supreme Court.

Description: Clearance rate

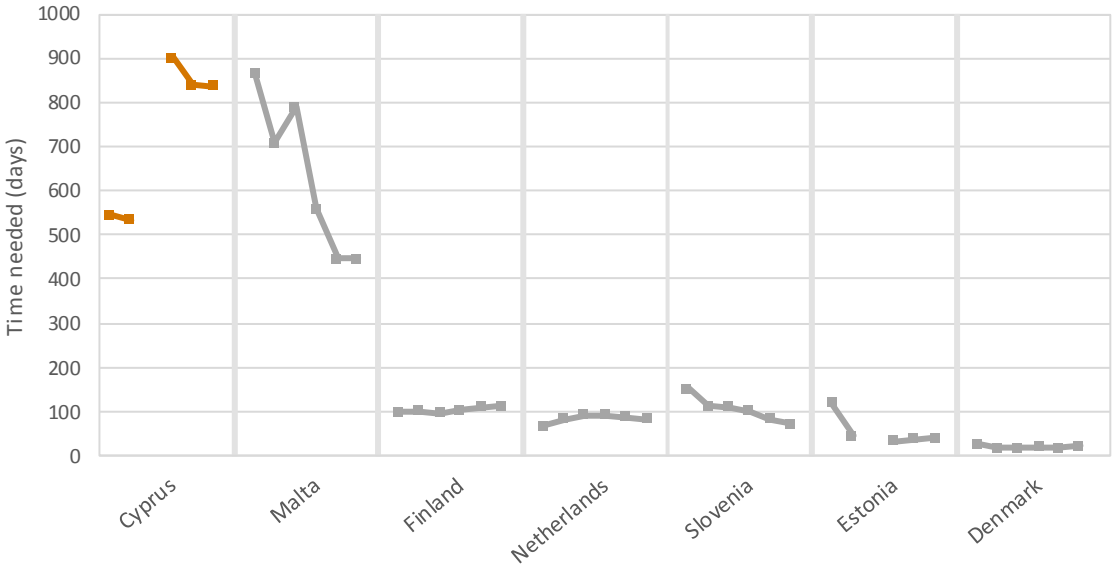
The clearance rate is the ratio of the number of resolved cases over the number of incoming cases. It measures whether a court is keeping up with its incoming caseload. When the clearance rate is about 100 percent or higher, it means the judicial system can resolve at least as many cases as new cases enter the system.

Description: Availability of ICT for case management

Availability of ICT for case management is assessed using the EU Justice Score methodology, and calculated as follows: equipment rate from 100 percent (device completely deployed) to 0 percent (device non-existing) indicates the functional presence in courts of the device covered by the graph, according to the following scale: 100 percent = 4 points if applicable to all matters / 1.33 points per specific matter; 50-99 percent = 3 points if applicable to all matters / 1 point per specific matter; 10-49 percent = 2 points if applicable to all matters / 0.66 point per specific matter; 1-9 percent = 1 point if applicable to all matters / 0.33 points per specific matter.

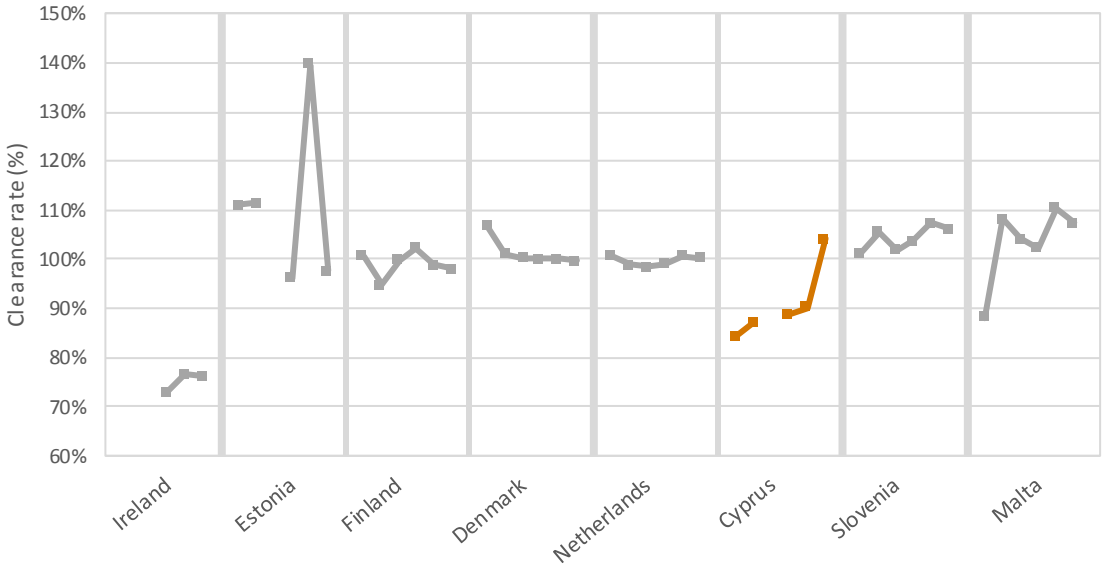
Source: 2018 EU Justice Scoreboard.

Figure 76 Time needed to resolve civil, commercial, administrative and other cases, 2010-2016



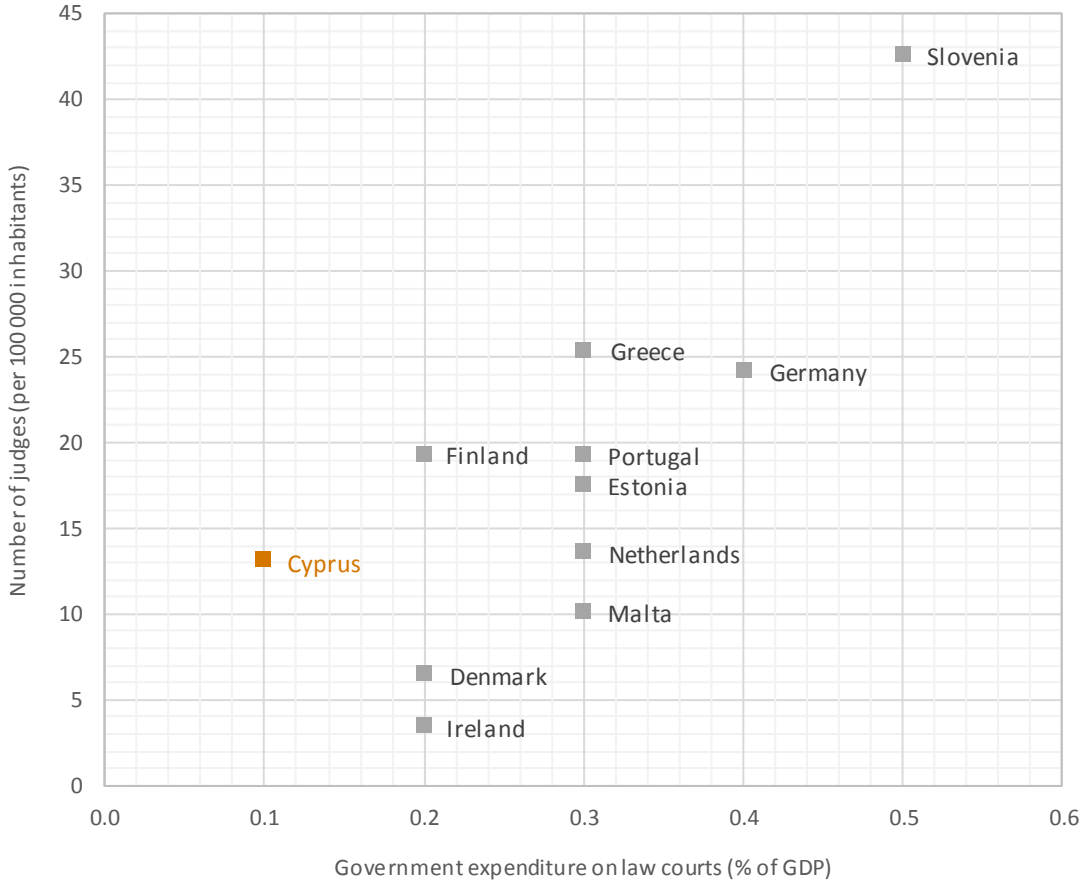
Notes: No data available for Germany or the UK. No data available for 2011.
Source: European Commission for the Efficiency of Justice (CEPEJ) (2018).

Figure 77 Clearance rates for civil, commercial, administrative and other cases, 2010-2016



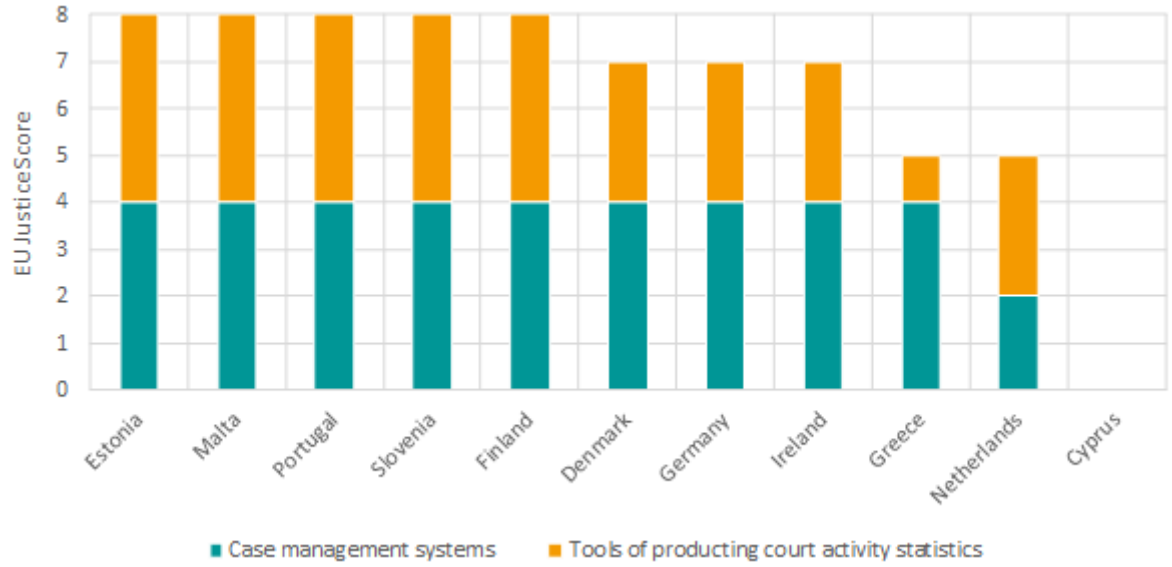
Notes: No data available for Germany or the UK.
Source: European Commission for the Efficiency of Justice (CEPEJ) (2018).

Figure 78 Expenditure on law courts and number of judges, 2016



Source: Eurostat, General government expenditure by function [gov_10a_exp]; and European Commission for the Efficiency of Justice (CEPEJ) (2018).

Figure 79 Availability of ICT for case management, 2016



Notes: Cyprus scores 0 on the EU Justice Score, indicating that no ICT tools are used in case management.
Source: European Commission for the Efficiency of Justice (CEPEJ) (2018).

6.3 Industry structure, specialisation & organisation

Industry structure, specialisation and organisation refers to the structure of the economy, the goods and services it produces, and how specialised or diversified the economy is. This theme also covers how production is organised, for example, how value chains or clusters are structured and whether intermediate inputs are sourced domestically. Comparative information on the economic structure of the benchmark countries is provided in Section 4.2 starting on page 55.

Value chains and clusters

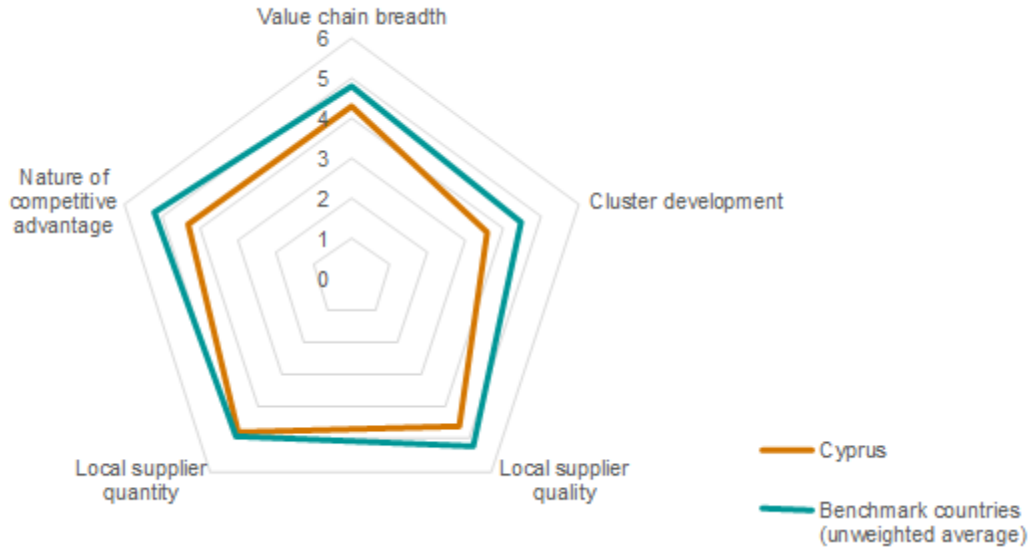
Increasing linkages within or across sectors, by deepening value-chain integration or strengthening clusters, is one approach for improving productivity. While Cyprus' small size may limit the size and scope of domestic value chains and clusters, it can also motivate companies to internationalise. The World Economic Forum executive opinion survey finds that value chains in Cyprus are not very deep, and that clusters are not well developed or deep. (Figure 80)

Where Cyprus excels, given the small size of the economy, is the presence and connectivity of global service firms. Cyprus performs better than Malta, Slovenia and Estonia. It also compares favourably to Greece, Denmark and Finland. This provides evidence of the considerable strength in Cyprus' specific niche of financial and professional services. (Figure 81)

Description: Global Cities

The Globalization and World Cities Research Network at Loughborough University classifies cities according to their importance in economic networks. The classification is based on a network model and a data set that covers the presence of service firms such as KPMG, Saatchi and Saatchi, Credit Suisse or Baker & McKenzie. Cities are scored from alpha++ cities, that only include London and New York, down to cities with sufficient services. Nicosia is rated as a Beta city and Limassol as a High sufficiency city.

Figure 80 Business sophistication summary, 2017



Notes: Based on values assigned 1-7, where [0=worst, 7=best].
Source: World Economic Forum, Global Competitiveness Report 2017-2018: *Business Sophistication Pillar.*

Figure 81 Global Cities, 2017

	Malta	Estonia	Greece	Slovenia	Finland	Ireland	Cyprus	Denmark	Portugal	Israel	Netherlands	UK	Germany
Alpha++												London	
Alpha+													
Alpha											Amsterdam		Frankfurt
Alpha-						Dublin			Lisbon	Tel Aviv			
Beta+					Helsinki			Copenhagen					Düsseldorf Munich Hamburg
Beta			Athens				Nicosia						Berlin
Beta-		Tallinn									Rotterdam	Birmingham Glasgow	Stuttgart Cologne
Gamma+				Ljubljana						Porto		Leeds	
Gamma												Belfast Bristol	
Gamma-												Liverpool	Leipzig Nürnberg
High sufficiency							Limassol	Arhus			Utrecht	Newcastle S.hampton Aberdeen	Dresden Hanover Bremen
Sufficiency										Jerusalem Haifa	The Hague	Cardiff Leicester	Dortmund Mannheim

Notes: Cities are categorised based on their connectivity through four advanced producer services: accountancy, advertising, banking/finance, and law.
Source: Globalization and World Cities Research Network, The World According to GaWC, 2017.

6.4 Firm characteristics, dynamism & sophistication

Firm characteristics, dynamism & sophistication refers to the size and structure of firms, enterprise dynamism (such as new business creation and high-growth enterprises[11]), the extent of entrepreneurship and entrepreneurial attitudes, and the sophistication of businesses and management quality. These attributes, which represent the overall industrial tissue of the economy, are important determinants of the competitiveness of firms, sectors and the economy as a whole. They are shaped, however, by other competitiveness factors such as the business environment,

[11] For Cyprus, data on firm creation and survival as well as high growth firms are only available up until 2015. As this was still an exceptional year for Cyprus, shortly after the banking crisis, this data is unlikely to provide an accurate assessment of the situation today.

market conditions and business-supporting infrastructure, such as financial markets.

As described in Section 3.1, small and medium-sized enterprises dominate the economy. More employees work in micro enterprises with less than 10 employees than in any other benchmark country. Cyprus also has the lowest share of employment in large enterprises (250 or more employees), although the underlying data exclude financial services, which are important for Cyprus. The presence of large enterprises matters because they can serve as important anchors by creating demand for intermediate inputs. They can also more readily export and enter new markets, showing the path for smaller companies. Finally, they more readily develop new technologies through more formalised innovation activities.

Entrepreneurship

Although Cyprus performs reasonably well for selected indicators, its position in the overall Global Entrepreneurship Index ranking is relatively weak compared to the benchmark countries. This suggests that the issues are not individual attitudes, activities or aspirations, but rather the institutional support network, ranging from soft factors such as societal perceptions of entrepreneurship to hard factors such as access to finance. (Figure 82)

It appears that only a very low proportion of employees engage in entrepreneurial activities, such as developing new products or setting up new business units within their own firms. This contrasts with a high percentage compared to most benchmark countries that report an intention to start a new business within the next three years. This suggests that constraints on entrepreneurship within firms exist but, conversely, individuals have a considerable appetite to engage in entrepreneurial activities. (Figure 83)

Other factors that have been identified by the European Commission as affecting entrepreneurship in Cyprus include a lack of media attention, limited entrepreneurship education at primary school and post-secondary levels, the relatively high cost of resolving insolvency, and a high fear of failure (European Commission, 2017b).

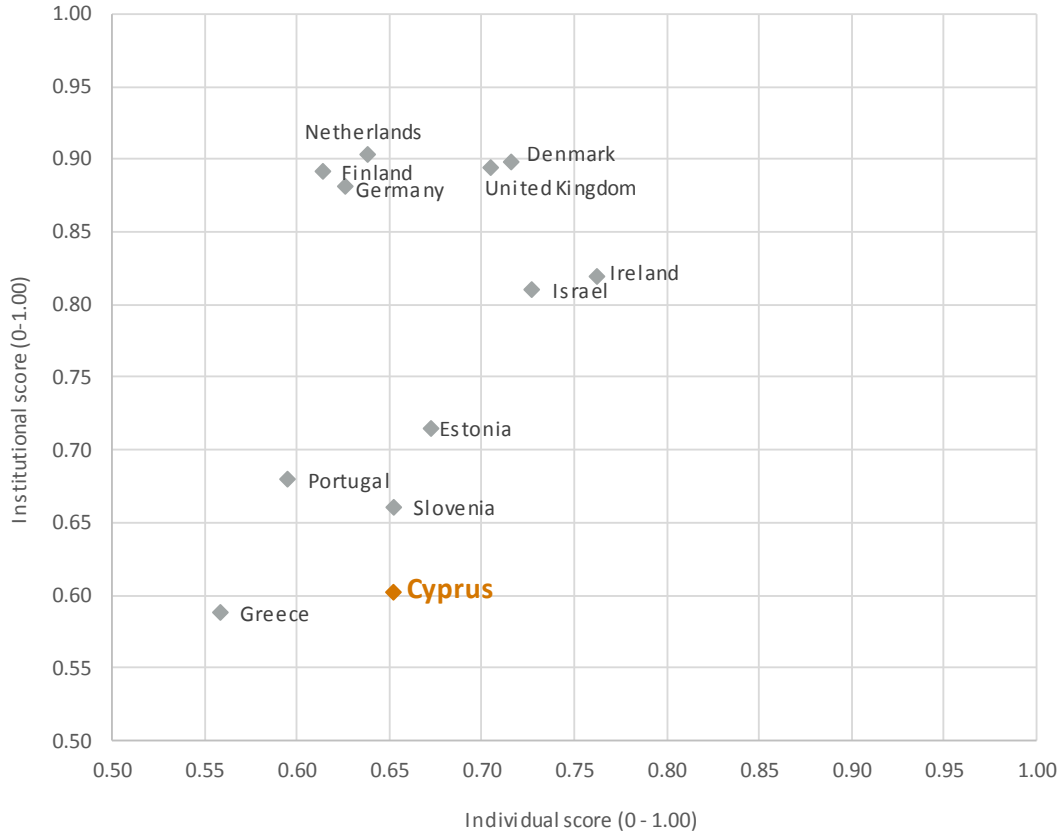
Description: Global Entrepreneurship Development Index

The Global Entrepreneurship Development Index (GEDI) is an annual index that measures the health of the entrepreneurship ecosystems in 137 countries. GEDI includes three sub-indices and 14 'pillars', as follows:

- Attitudes includes the pillars Opportunity Reception, Start-up Skills, Risk Acceptance, Networking and Cultural Support;
- Abilities includes the pillars Opportunity Start-up, Technology Absorption, Human Capital and Competition;
- Aspiration includes the pillars Product Innovation, Process Innovation, High Growth, Internalization and Risk Capital.

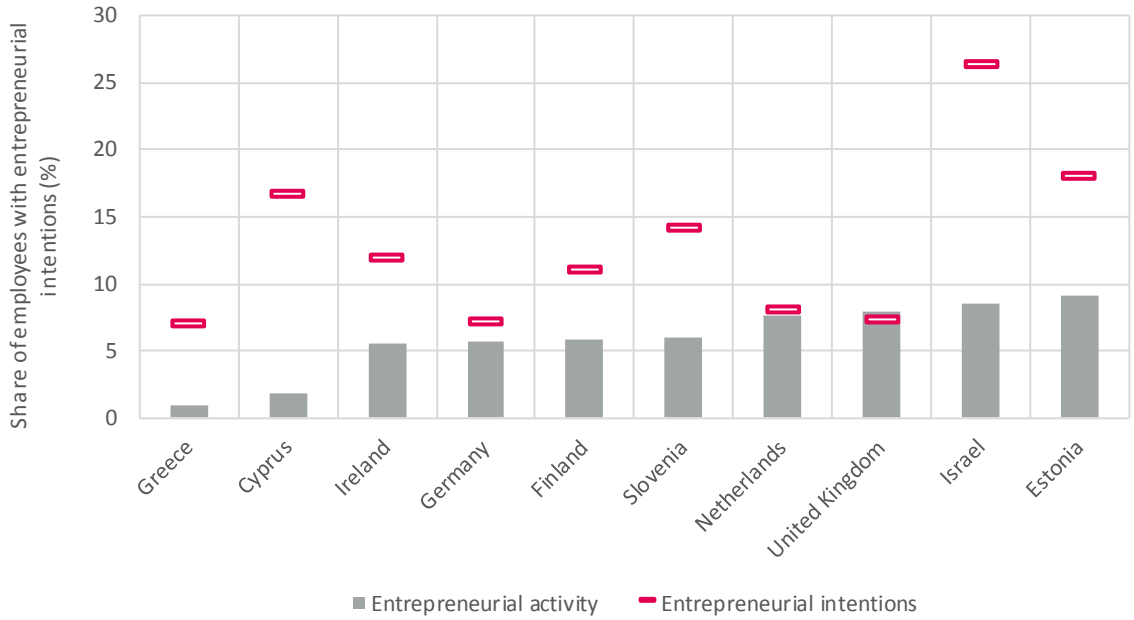
GEDI distinguishes between institutional and individual factors, with the former including factors such as property rights, education or the depth of capital markets. The latter includes factors such as perceptions on skills or risk, or the perceived presence of strong competitors. The index is scaled between zero and one, with one indicating the healthiest entrepreneurship ecosystem.

Figure 82 Individual and institutional entrepreneurship, 2017



Source: Global Entrepreneurship Development Institute, Global Entrepreneurship Index Report 2018.

Figure 83 Entrepreneurial activities and intentions, 2017



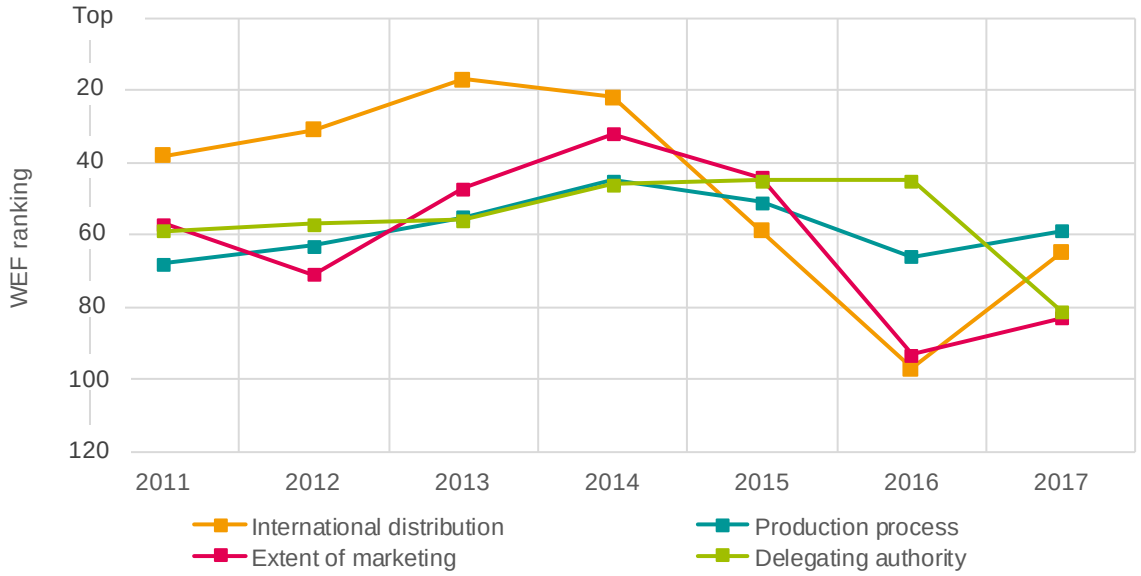
Notes: Entrepreneurial activity measured by the percentage of employees participating in entrepreneurial activities for their employer, such as developing or launching new goods or services, or setting up a new business unit, a new establishment or subsidiary. Entrepreneurial intentions measured by the percentage the population aged 16-64 planning the start a new business, including any type of self-employment, within the next three years. Recent data not available for Denmark, Malta and Portugal.

Source: Global Entrepreneurship Research Association, Global Entrepreneurship Monitor Global Report 2017/2018.

Business sophistication

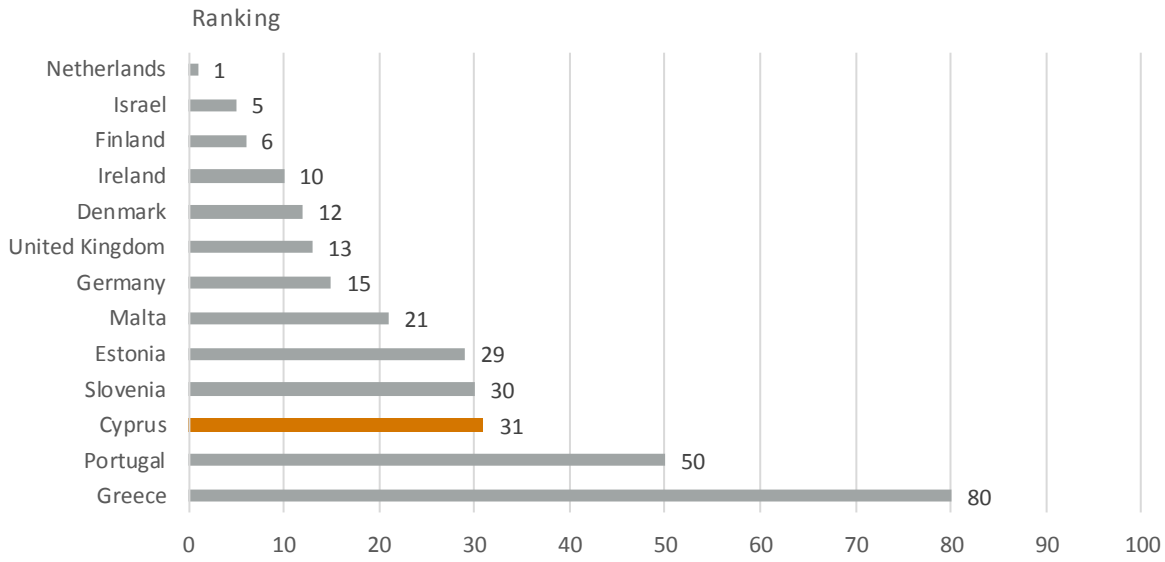
Although differences to other benchmark countries are not substantial, both the World Economic Forum and the Global Innovation Index find that business sophistication in Cyprus is relatively low. Business sophistication has worsened after the 2012-13 banking crisis, at least in relative terms. This is less the case for the internal aspects of business sophistication (i.e. 'Production processes' and 'Delegation of authority'), and more so for the external aspects such as 'International distribution' and 'Marketing'. A possible explanation is that the contraction of markets following the crisis also reduced the complexity and sophistication of markets. For example, lower consumer purchasing power may have reduced incentives for business to make investments in more sophisticated marketing activities or distribution channels. (Figure 84 and Figure 85)

Figure 84 WEF Business sophistication rankings for Cyprus, 2011-2017



Source: World Economic Forum, Global Competitiveness Reports: Control of Internal Distributions, Production Process Sophistication, Extent of Marketing, Willingness to Delegate Authority.

Figure 85 Global Innovation Index (GII) business sophistication rankings, 2017



Source: Cornell University, INSEAD, and WIPO (2018), The Global Innovation Index 2017.

Intangible assets

As a proportion of total business investment, investment into various intangible assets in Cyprus is broadly comparable to the EU average and the benchmark countries (Figure 86). At the same time, total investment per employee is well below the EU average and all benchmark countries (Figure 87). Hence, while the overall structure of investments by asset type is not fundamentally different from other benchmark countries, the absolute amount of investment per worker in Cyprus is relatively low for both tangible and intangible assets. On the one hand, this suggests that investment levels need to be raised. On the other hand, it poses questions as to whether Cyprus should prioritise raising levels of investment or whether it should target specific asset types, particularly investment categories, including intangible assets, which are more likely to bring productivity improvements.

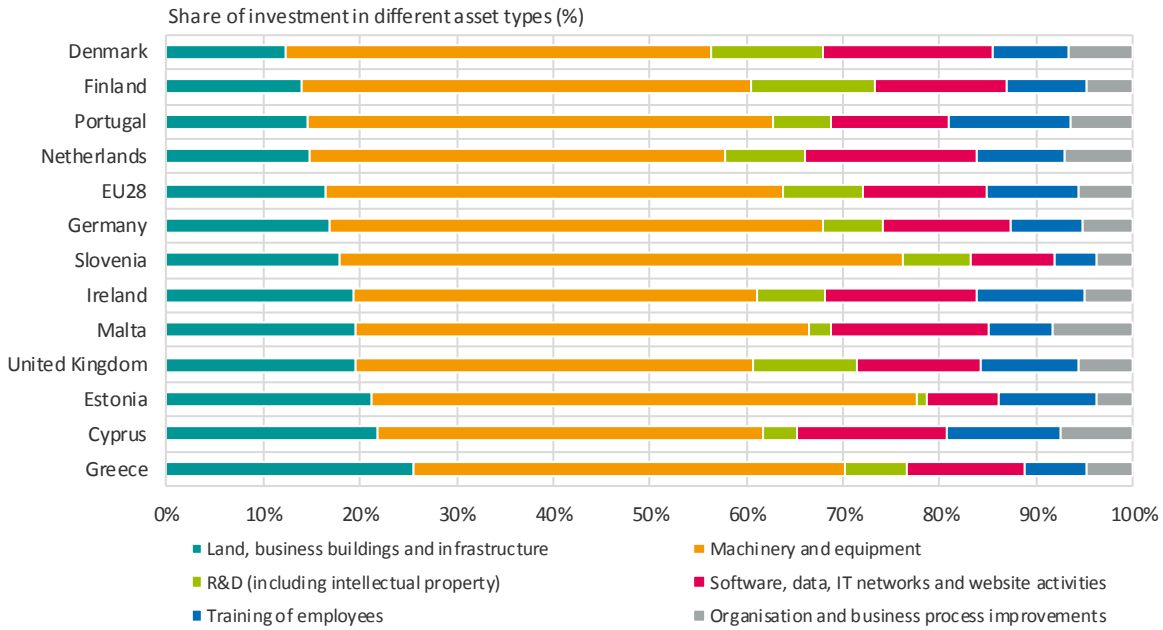
Description: Intangible assets

There are various definitions of intangible assets but generally they are considered to cover assets created through innovation and discovery, assets embedded in organisational practices (including also investments in customer satisfaction, product quality and brand reputation), and assets related to human capital. Intangible assets cover, for example, investment in R&D, innovation and technology development, training/education of workers, internal organisation structures, customer and institutional networks, market exploration and development (marketing), and software and information technology.

It has long been recognised that intangible investment, such as, for example, R&D or software, are important for understanding productivity, competitiveness and economic growth. National accounts definitions have increasingly recognised this importance, with the asset category of 'intellectual property products' currently comprising items such as R&D, mineral exploration, computer software and databases, entertainment, literary and artistic originals.

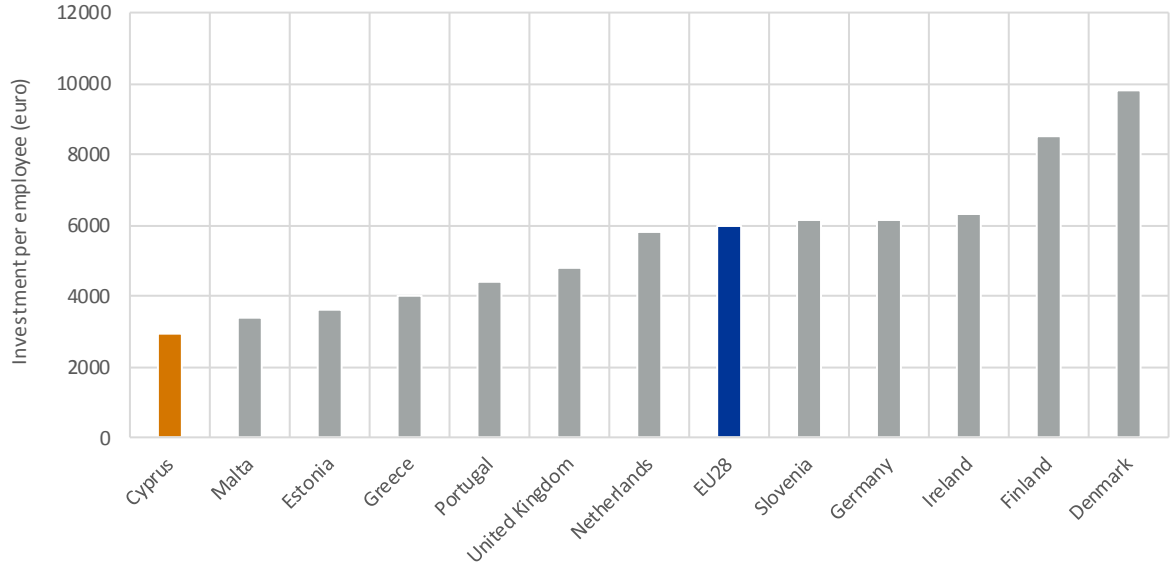
Source: Thum-Thysen et al. (2017).

Figure 86 Investment by asset type, 2017



Source: EIB Investment Survey, Investment Activity: Average share of investment in different asset types, 2017.

Figure 87 Investment intensity, 2017



Source: EIB Investment Survey, Investment intensity: Total investment per employee, 2017.

7 Benchmark of input factor competitiveness drivers

Input factor competitiveness drivers are those factors that directly feed into the production and value-creation processes of enterprises. These are grouped into four themes: human capital; technology, innovation and knowledge; financial infrastructure; and productive and physical infrastructure.

Human capital refers to the availability and quality of the workforce. *Technology, innovation and knowledge* refers to public investments into technology and innovation, the knowledge infrastructure, and the technological and innovation characteristics of firms. It reflects the importance of technological breakthroughs and technology-based innovations as the basis of many productivity gains. *Financial infrastructure* covers the institutions that provide access to finance and financial services. *Productive and physical infrastructure* refers to infrastructure such as transportation, utilities or telecommunication infrastructure.

7.1 Human capital

Human capital refers to the availability and quality of the workforce. It reflects the skills, competences and other attributes embodied in workers—individually or collectively—that are used to produce goods, services, and ideas. Human capital is described through indicators that capture the provision of education, educational attainment and outcomes, and the availability and quality of specific skills.

Education system

At 6 percent of GDP, Cyprus has one of the highest shares of government expenditures on education among the benchmark countries, which compares to an EU average of 5 percent. (Figure 88) Furthermore, reported private spending on education in Cyprus is significant, in contrast to many other countries.

Cyprus also has one of the highest proportions of the population that has completed tertiary-level education at 38 percent. A further 38 percent have completed secondary education. This compares to an EU28 average of 27 percent of the population having tertiary education, and 46 percent with secondary education. (Figure 89)

Moreover, Cyprus currently has the highest share of 25 to 34-year olds with tertiary education of all benchmarked countries, with 56 percent compared to an EU average of 38 percent. (Figure 90)

While overall tertiary educational levels are impressive, Cyprus has a comparatively low share of pupils enrolled in vocational secondary education, with only 16 percent compared to the EU28 average value of 47 percent. The low level of vocational education for Cyprus presents a mirror image of the high levels of tertiary education, suggesting that secondary-level education is orientated towards preparing students for entry into tertiary education, rather than equipping them with specific skills to enter the job market. (Figure 91)

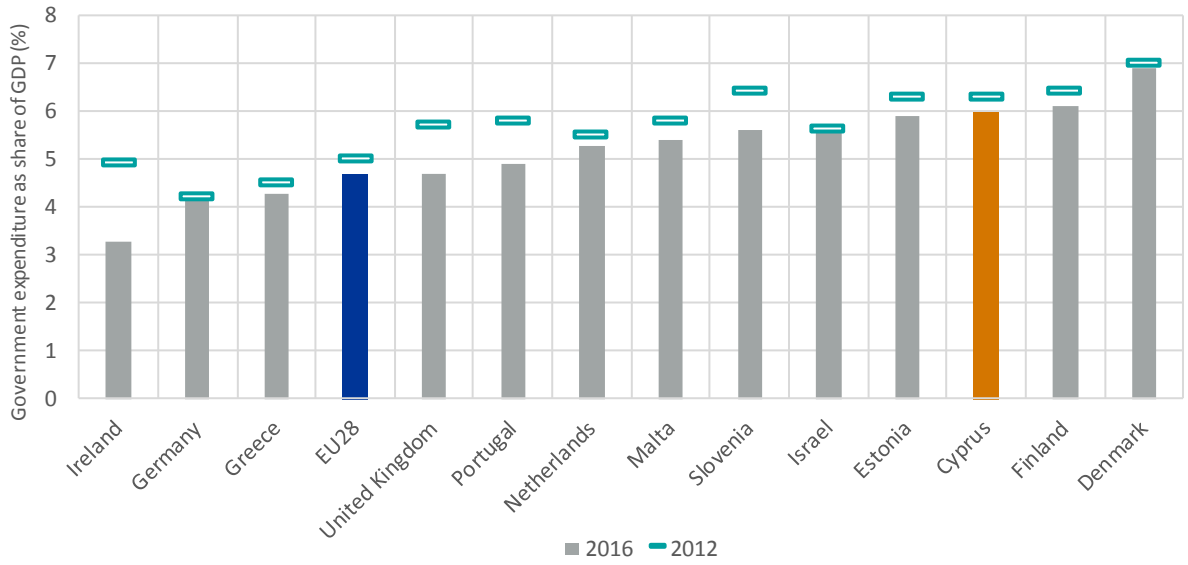
Alongside a low rate of vocational education, among the benchmark countries, Cyprus also has the lowest proportion of Science, Technology, Engineering and Mathematics (STEM) graduates among 20-29 year-olds. The country with the highest number, Ireland, has 32 STEM graduates per thousand individuals aged 20-29, over three times the number in Cyprus. (Figure 92)

The proportion of early-school leavers (i.e. students that fail to obtain upper-secondary qualification or equivalent) is 9 percent in Cyprus, 2 percentage points lower than the EU average. Slovenia performed best with a rate of 5 percent while Malta performed the worst

at 19 percent. Most of the benchmark countries have seen fewer early school leavers; however, the early school leaving rate in Cyprus actually rose in the last two years.

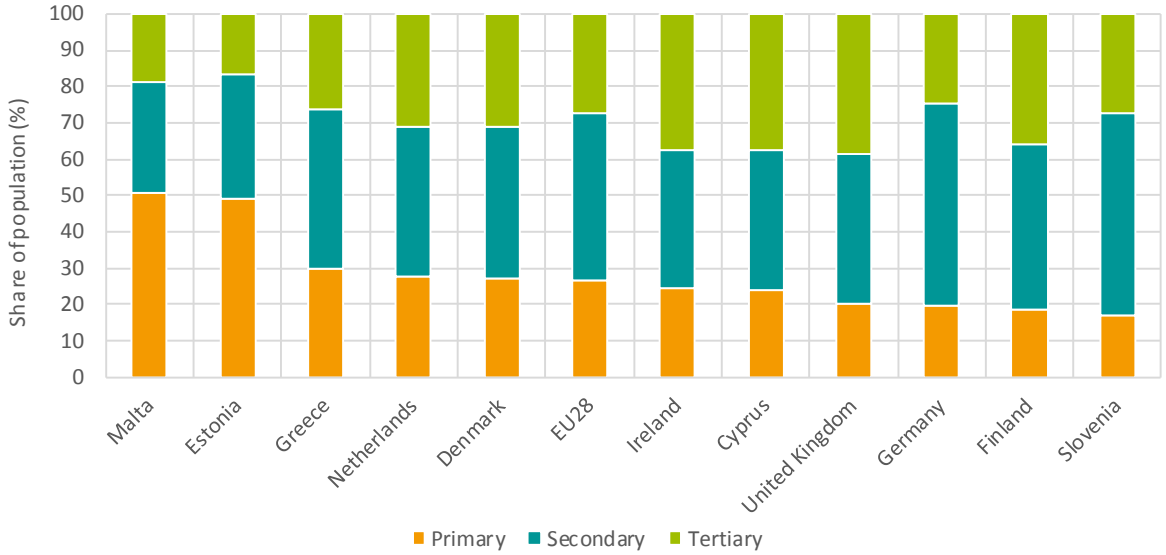
In-work training is also limited, but not exceptionally so. In 2015, the latest year for which data is available, the share of enterprises providing training to their employees in Cyprus was close to the EU average, but lower than most of the benchmark countries, with only Greece and Malta having a lower share of firms providing training. (Figure 94)

Figure 88 Government expenditure in education, 2012 and 2016



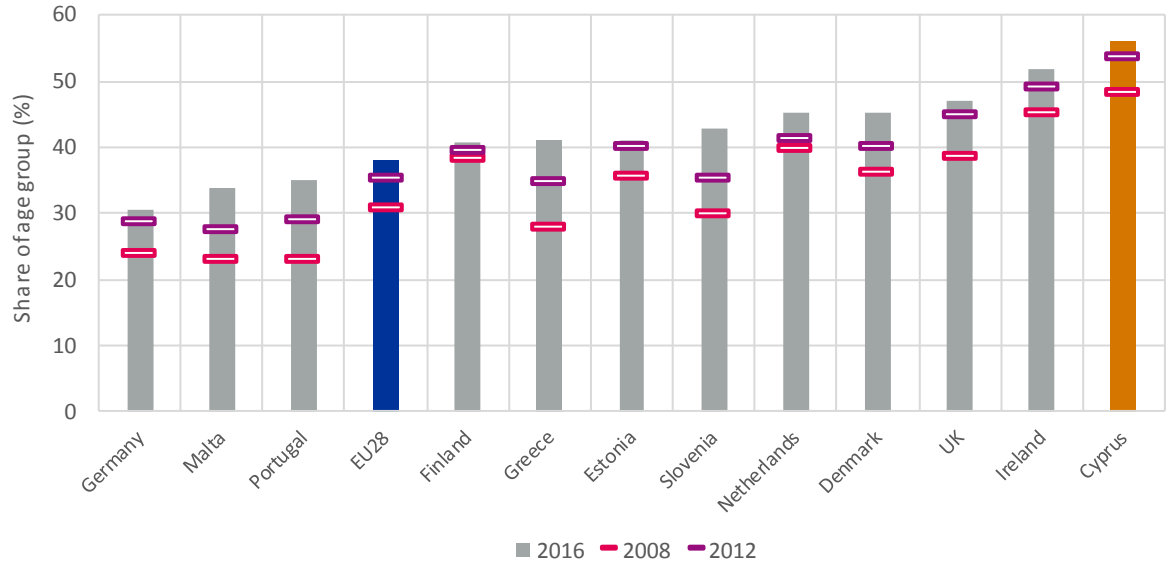
Source: Eurostat, General government expenditures by function [gov_10a_exp].

Figure 89 Educational attainment levels of population aged 15-64, 2017



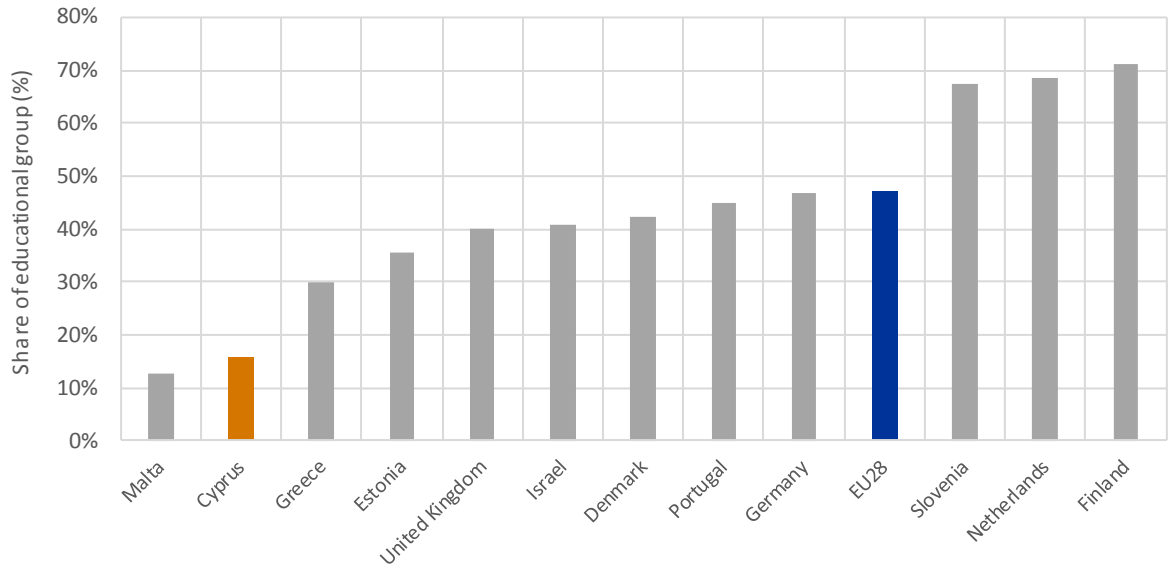
Source: Eurostat, Population by educational attainment level [edat_lfse_03].

Figure 90 Share of 25-34 year olds with tertiary education, 2008, 2012 and 2017



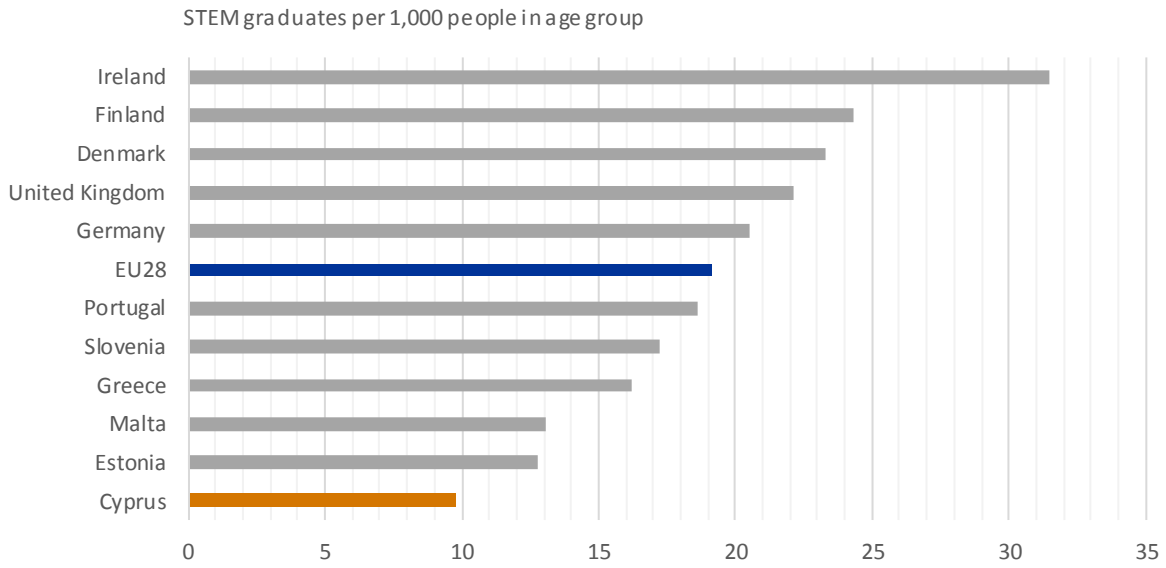
Source: Eurostat, Population by educational attainment level aged 25-34 [edat_lfse_03].

Figure 91 Vocational enrolment as share of secondary education enrolment, 2016



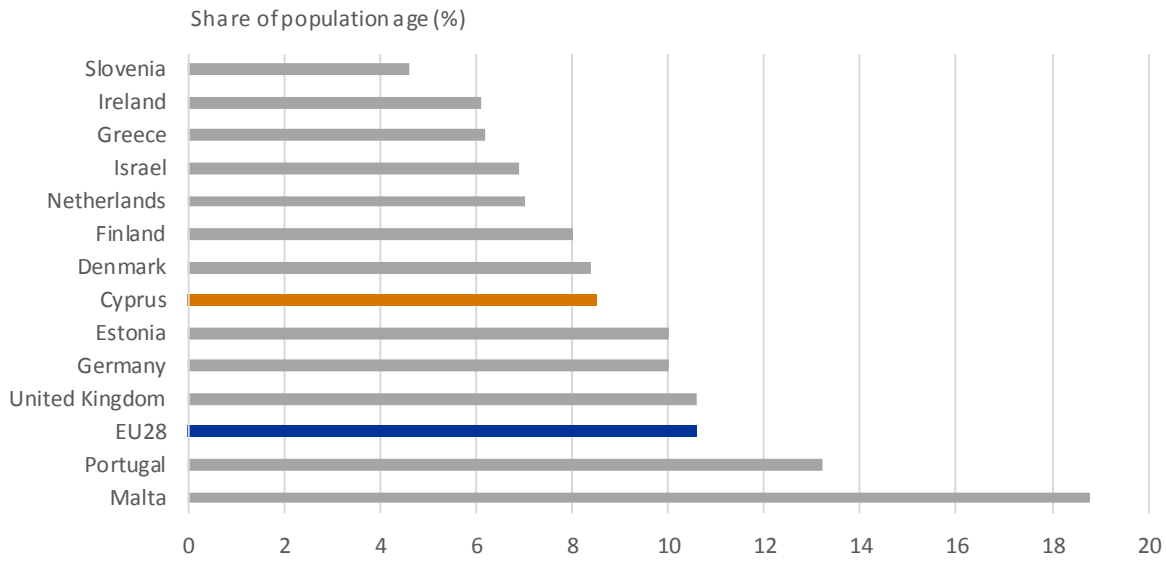
Source: Eurostat, Pupils enrolled in upper secondary education by programme orientation, [educ_uoe_enrs04]. For Israel, European Training Foundation.

Figure 92 STEM graduates among 20 to 29-year olds, 2016



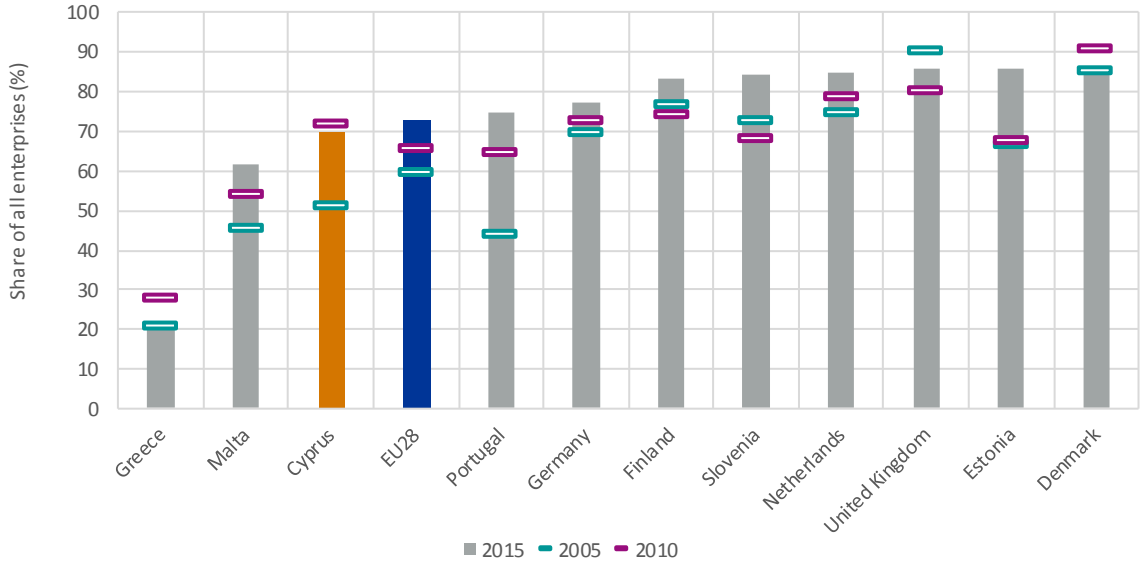
Notes: No data available for the Netherlands.
Source: Eurostat, Graduates in tertiary education, in science, math., computing, engineering, manufacturing, construction per 1000 of population aged 20-29 [educ_uoe_grad04].

Figure 93 Early school leavers in the young population, 2017



Source: Eurostat, Early leavers from education and training as percent of population aged 18-24, 2017. For Israel, European Training Foundation.

Figure 94 Enterprises providing training to their employees, 2005, 2010 and 2015



Notes: All sectors excluding financial sector. Enterprises with less than 10 employees not included. Data for Ireland not available.
Source: Eurostat, Enterprises providing training by type of training and size class [trng_cvt_01s].

Educational performance and skills

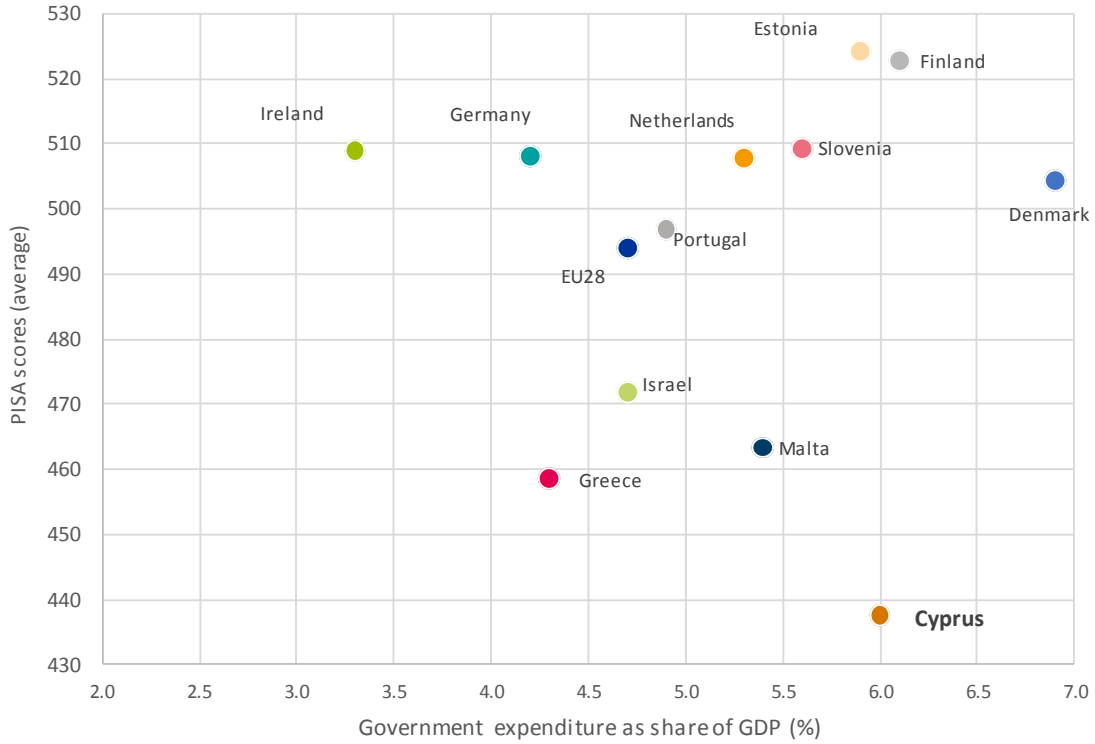
While the education system in Cyprus is seemingly well-funded and produces large numbers of tertiary graduates, educational outcomes do not match the level of spending. Cyprus has the lowest PISA results for science, mathematics and reading among the benchmark countries and is behind the EU average. Although standardised test scores can be criticised for overly emphasizing quantifiable aspects of education, Cyprus stands out as a country with both significant expenditures on education and relatively weak test scores. This suggests that improving educational outcomes may not require increased funding but rather improved effectiveness of the educational system. (Figure 95)

As already noted, Cyprus has a low proportion of graduates in STEM subjects. More broadly, digital skill levels in the population are low. Among the benchmark countries, Cyprus has the lowest share of 16 to 74-year olds reporting that they have above basic digital skills, with only 19 percent reporting a basic level, compared to an EU average of 31 percent. At the same time, 26 percent of firms in Cyprus report that they provide ICT training, which is slightly above the EU average and comparable to most benchmark countries. (Figure 96)

The comparatively low level of science and digital skills can be viewed in the context of various indicators that point to low levels of adoption of digital technologies in the private sector (Figure 106 on page 108) and public institutions (Figure 73 on page 82 and Figure 79 on page 87). Even if current demand for STEM or digital skills is modest, the increasing importance of digital technologies across all sectors suggests that Cyprus may be at risk of falling behind if the Cypriot workforce and the educational system are not fully prepared to adapt to new and emerging trends.

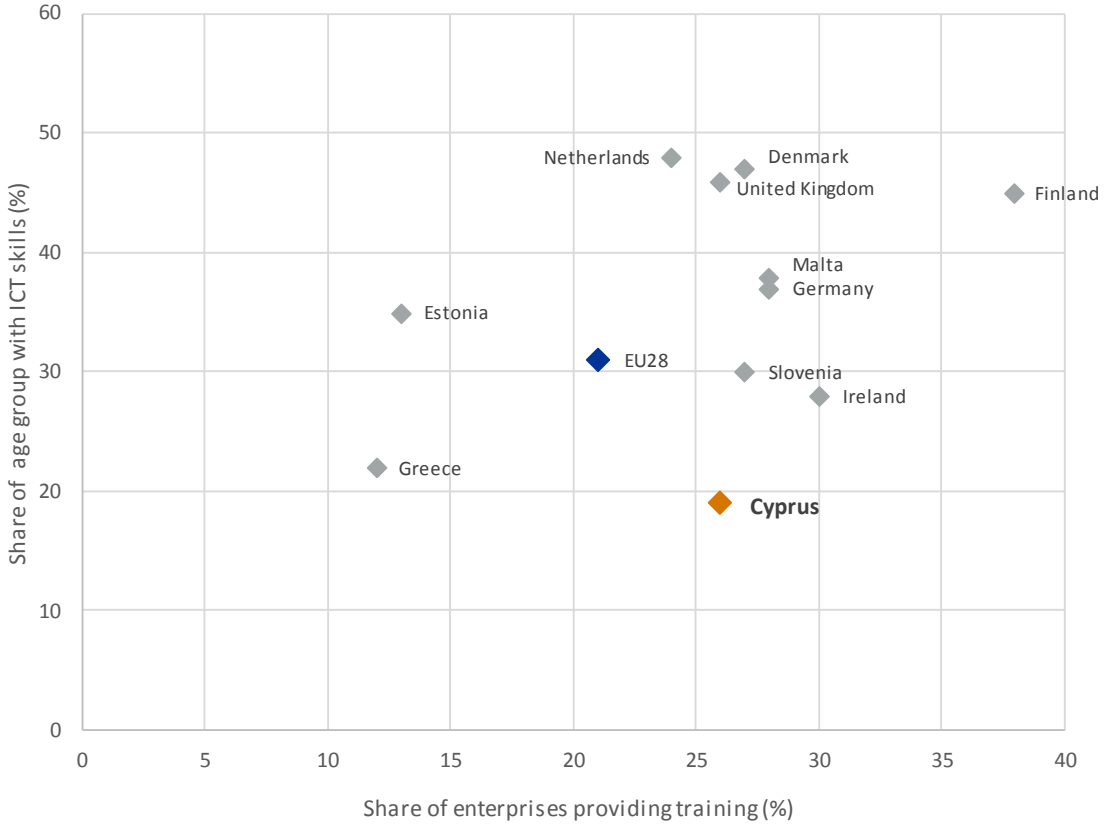
The percentage of the population in Cyprus that self-reports knowing one or more foreign languages is almost 90 percent; and while the data does not indicate which foreign languages are spoken, for Cyprus it can be presumed that English is dominant among the foreign languages spoken. (Figure 97)

Figure 95 Educational performance by expenditure, 2015



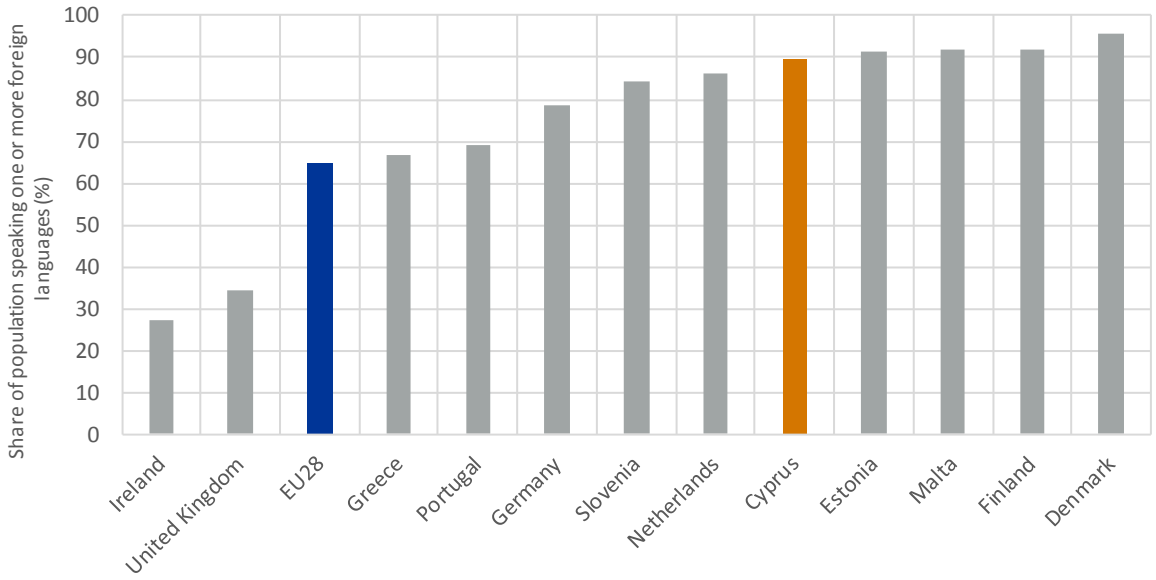
Notes: Unweighted average of PISA scores for Mathematics, Science and Reading, own calculation.
Source: PISA, Mean scores, 2015; Eurostat, General government expenditures by function.

Figure 96 ICT training and skills, 2017



Notes: ICT Training measured by the share of enterprises providing ICT training to their employees. ICT Skills measured as the share of individuals of age 15 and above with above basic digital skills.
Source: Eurostat, Individuals' level of digital skills, [isoc_sk_dskl_i], and Enterprises that provided training to develop/upgrade ICT skills of their personnel [isoc_ske_ittn2].

Figure 97 Share of population that knows a foreign language, 2016



Source: Eurostat, Number of foreign languages known (self-reported of people aged 25-64), [edat_aes_l2].

Skills mismatch

The well-funded education system in Cyprus appears to deliver a highly educated workforce, with a high proportion of tertiary graduates. There does seem to be a weak emphasis on more scientific and technical subjects, including ICT-related skills. Moreover, although cyclical conditions may explain overall labour market conditions, Cyprus has high rates of youth unemployment (Figure 15 on page 35) and a comparatively high proportion of young persons who are not in employment, education or training (Figure 53 on page 68). This may indicate that the education system is failing a small, but not insignificant, number of students that are unable to enter the workforce or further pursue their education or training.

Discrepancies between education and the labour market are also apparent from estimates of skills mismatch. Based on the proportion of tertiary education graduates currently employed in low-skilled jobs, Cyprus has the highest levels of over-qualification in the workforce among the benchmark countries, particularly in manufacturing, professional services, wholesale and retail distribution, and public administration. (Figure 98)

Similarly, a mismatch of horizontal skills suggests many employees work in occupations that are unrelated to their field of education. This mismatch not only exists in fields such as the humanities or education, but also in fields such as computing, science, mathematics and engineering. (Figure 99)

Taken together, these findings suggest that the educational system is not as efficient as it could be in delivering a qualified workforce corresponding to market needs. This is an important competitiveness issue if it means that employers, particularly in the private sector, are constrained by a lack of appropriately skilled workers. And it is obviously an issue for those unable to find work that suits their level and field of education. Finally, it could also imply that employers and workers need to pursue further training, whether through post-education or in-house training. However, as shown above, it appears that levels of in-work training in Cyprus are comparable to the levels seen in the benchmark countries.

Description: Skills mismatch

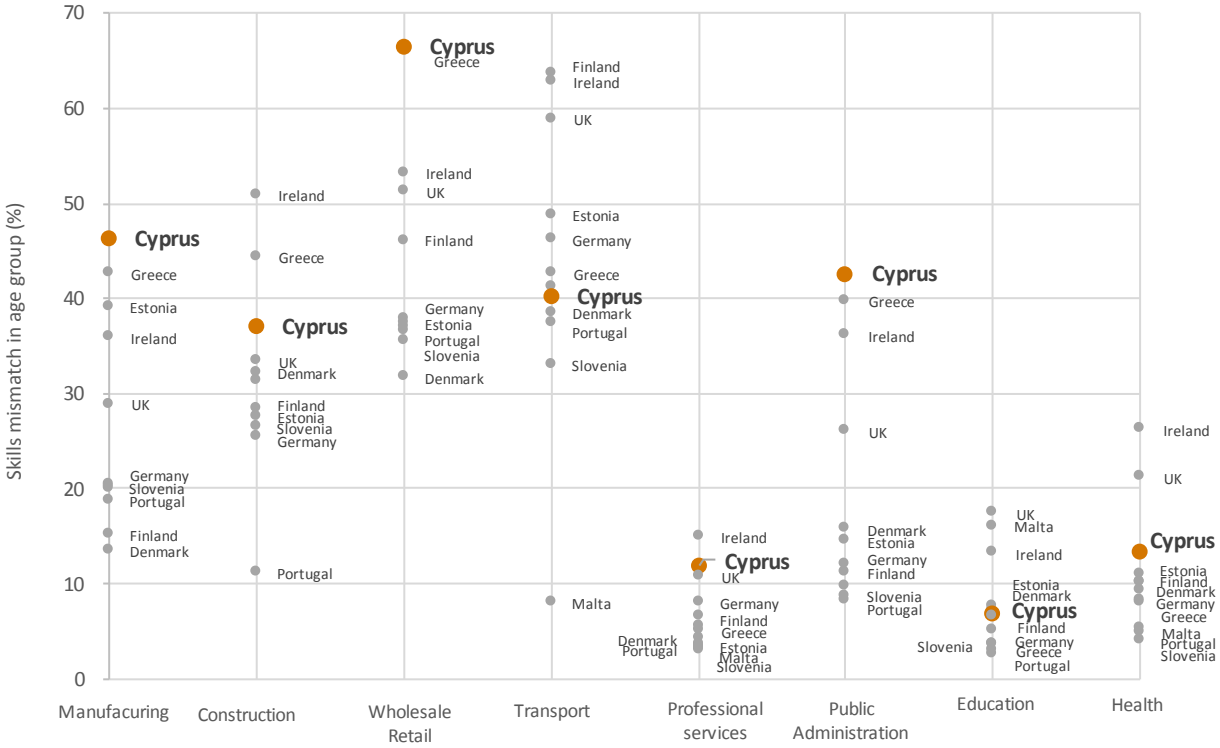
A skills mismatch in the labour markets is defined as a situation where skills of workers do not match the skill requirements and needs of their jobs. A vertical skills mismatch is a situation in which the level of educational attainment does not match the skill requirements of the job (over and under-qualification). For example, a university graduate employed as a sales clerk in retail is a vertical skills

mismatch. A horizontal skills mismatch is a situation in which the type of education does not match the skill requirements of the job. For example, an engineering graduate employed as a hotel manager is typically a horizontal skills mismatch.

In practice, the measurement of skills mismatch is difficult, and the data shown are produced by Eurostat on an experimental basis. Eurostat defines vertical skills mismatch or over qualification as a situation in which employed persons who have attained tertiary education work in occupations for which a tertiary education level is not required. A horizontal skills mismatch is defined as a situation in which the field of education of an employed person is not related to their current occupation.

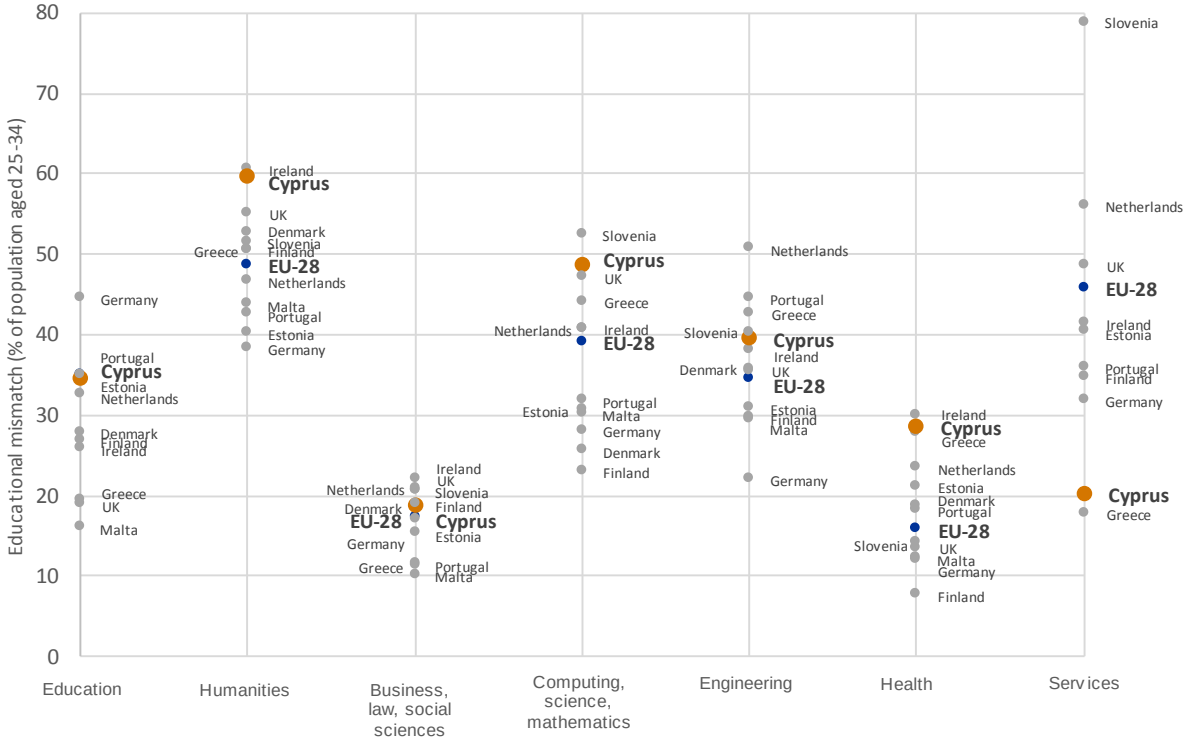
Source: https://ec.europa.eu/eurostat/web/skills/background/experimental-statistics

Figure 98 Vertical skills mismatch per industry, 2016



Notes: Information missing for Malta in several sectors.
Source: Eurostat, Vertical skills mismatch: over-qualification rate, 2016.

Figure 99 Horizontal skills mismatch per subject area, 2016



Source: Eurostat, Horizontal skills mismatch: field of education, 2016.

7.2 Technology, innovation and knowledge

Technology, innovation and knowledge refers to public investments into technology and innovation, the knowledge infrastructure, and the technological and innovation characteristics of firms. It reflects the importance of technological breakthroughs and technology-based innovations as the basis of many productivity gains. It covers product innovation (i.e. the introduction of new or improved products), innovations in production processes, new marketing methods, new organisational methods, new business practices, and new ways of organising value chains or other forms of cooperation.

To some extent, the small size of the domestic market of Cyprus could limit opportunities for technology, innovation and knowledge creation by both the public and private sector. Also, structural and cyclical factors may come into play. For example, the service-oriented structure of the economy, the lack of large enterprises, any lingering effects from the domestic banking crisis and constraints on public finances that weigh on the public sector's ability to maintain and expand public investments and the knowledge infrastructure. At the same time, the relative openness of the economy, integration with the EU, and high levels of educational attainment are factors that should facilitate and promote technology, innovation and knowledge creation.

Innovation performance

While Cyprus' performance in the European Innovation Scoreboard ranks below the EU average and lags particularly behind Northern European countries, it is comparable to other small and Mediterranean countries. The index value for Cyprus fell between 2013 and 2014, widening the gap between Cyprus and the Innovation Scoreboard leaders. In recent years Cyprus has improved and has started to catch-up. (Figure 100)

Although not presented here, the data underlying the Innovation Scoreboard show that, while Cyprus does particularly well in educational attainment and academic research outputs, it struggles to translate this prowess into a strong innovation performance of the private sector. One explanation comes from the

situation of the financial sector and investment conditions, with Cyprus falling behind in areas of relevance for private-sector innovation activities, namely finance and support, firm investment, SME innovation and linkages.

The Global Innovation Index ranks Cyprus rather well in knowledge and technology outputs; a result driven by strengths in academic research and publications, new business creation and FDI outflows. However, as shown earlier in this report, indicators based on FDI data need to be interpreted cautiously because of the influence of Special Purpose Entities and do not necessarily reflect strengths in (domestic) technology and innovation. For the sub-index creative outputs, the Global Innovation Index ranks Cyprus poorly compared to benchmark countries, especially in the creation of intangible assets or creative goods.[12] Similarly, Cyprus does weakly when compared to most benchmark countries in terms of per capita patent applications to the European Patent Office (EPO). (Figure 101)

Description: European Innovation Scoreboard

The European Innovation Scoreboard "provides a comparative analysis of innovation performance in EU countries, other European countries, and regional neighbours. It assesses relative strengths and weaknesses of national innovation systems and helps countries identify areas they need to address." The Scoreboard ranks countries according to 10 broad areas: human resources, the attractiveness of the research system, innovation-friendly environment, finance and support, firm investment, SME innovation, linkages and cooperation, intellectual assets, employment impacts, and sales impacts.

Description: Global Innovation Index (sub-indices)

Knowledge and Technology Outputs Index

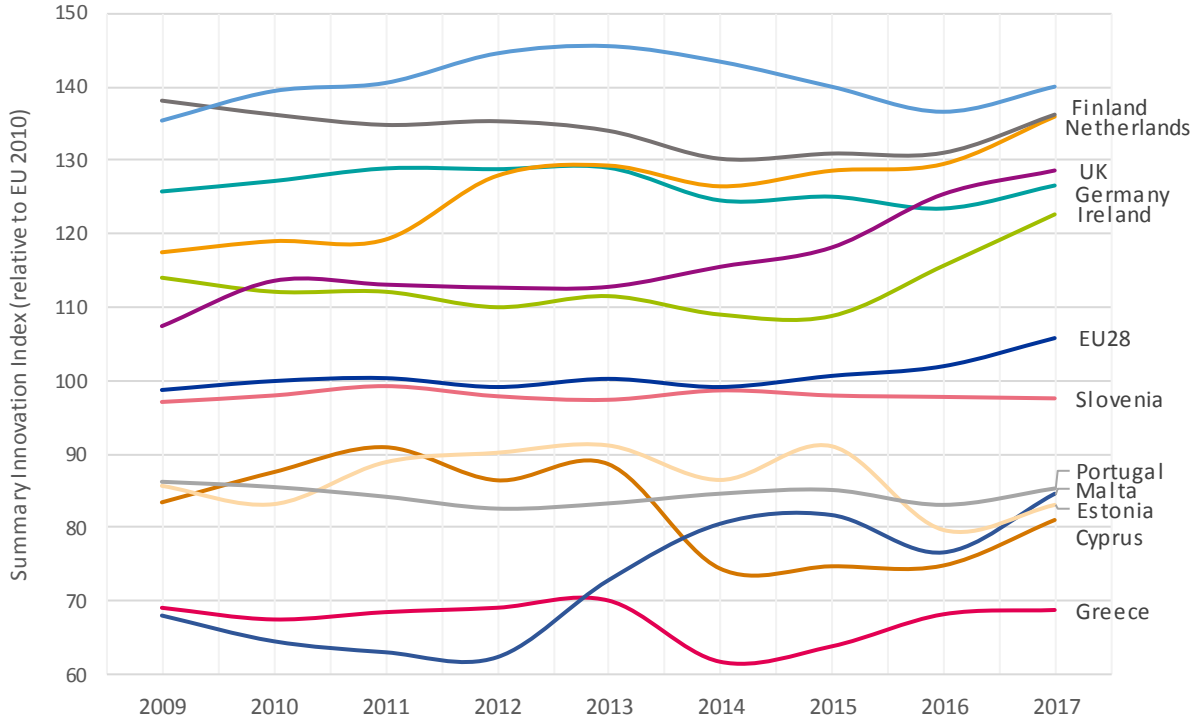
Knowledge and technology outputs is a sub-index of the Global Innovation Index, and covers knowledge creation, impact and diffusion. Knowledge creation includes patents or publications. Knowledge impact includes per capita growth rates, new business creation or technology adoption by firms. Knowledge diffusion includes trade in knowledge-intensive good or services or FDI outflows.

Creative Outputs Index

The creative outputs index is a sub-index of the Global Innovation Index. It covers intangible assets, creative goods and services, and online creativity. Intangible assets include the creation of new business models, organisational models, trademarks and industrial designs. Creative goods and services include the creation of films, publications, or other media products. Online creativity includes an online presence through top-level domains, Wikipedia edits or YouTube uploads.

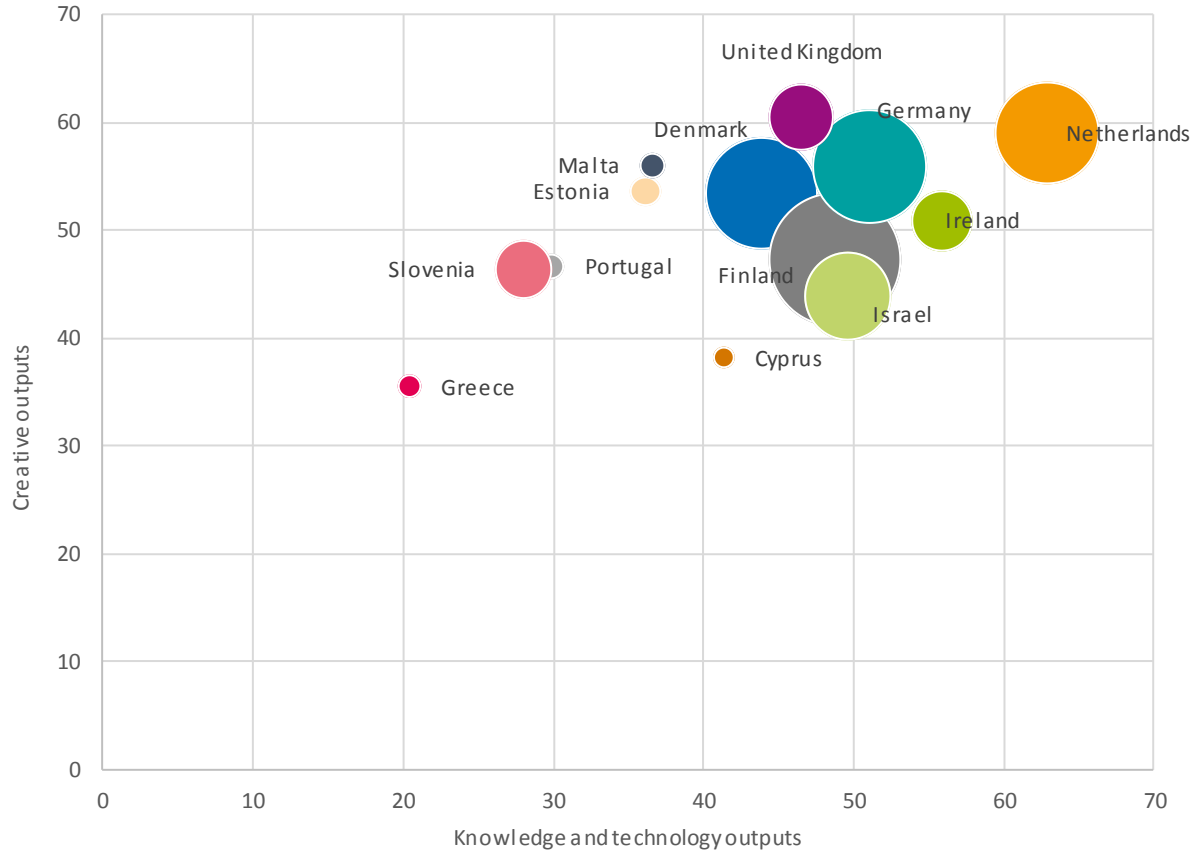
[12] According to the EIB investment survey, Cyprus is broadly comparable to the EU average in the share of intangible assets in total investments. But the definitions of intangible assets are not comparable, with the EIB including all intangible assets, whereas the Global Innovation Index focuses on new business and organisational models, trademarks and industrial designs.

Figure 100 European Innovation Scoreboard Index, 2007-2017



Source: European Commission, DG Internal Market, Industry, Entrepreneurship and SMEs, *European Innovation Scoreboard.*

Figure 101 Knowledge, technology and innovation outputs, 2017



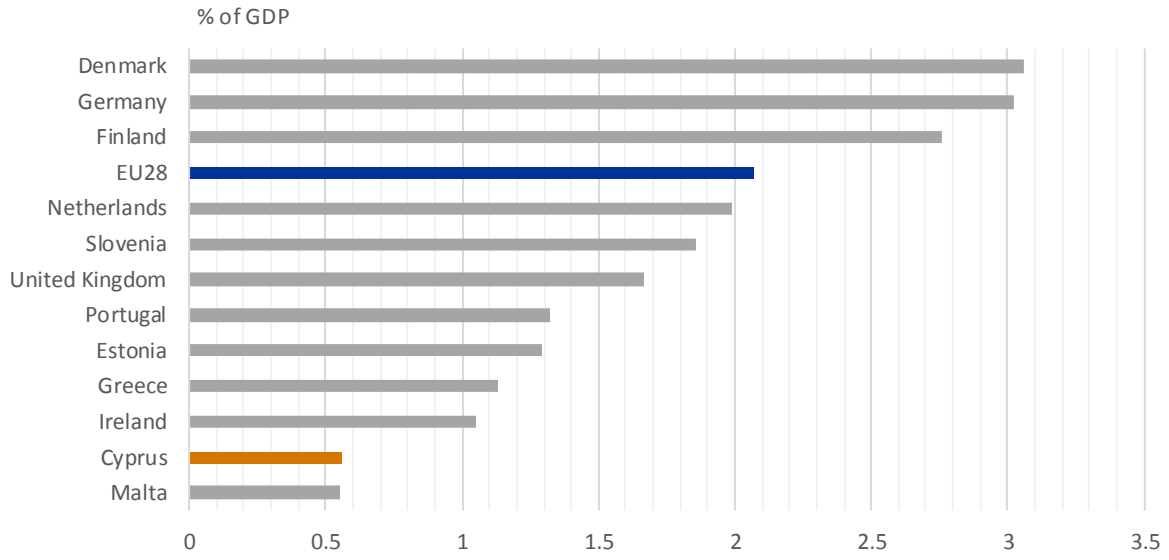
Notes: Bubble size reflects the number of patent applications per inhabitant.
Source: Cornell University, INSEAD, and WIPO (2018), The Global Innovation Index 2017: Knowledge and Technology Outputs; and European Patent Office (EPO) statistics: European patent applications per country of residence of the first named applicant.

Research and development expenditures

Overall investments into research and development in Cyprus are limited. Cyprus ranks behind all benchmark countries in R&D expenditure as a share of GDP, with countries such as Germany, Denmark or Finland achieving shares more than five times higher than Cyprus. (Figure 102)

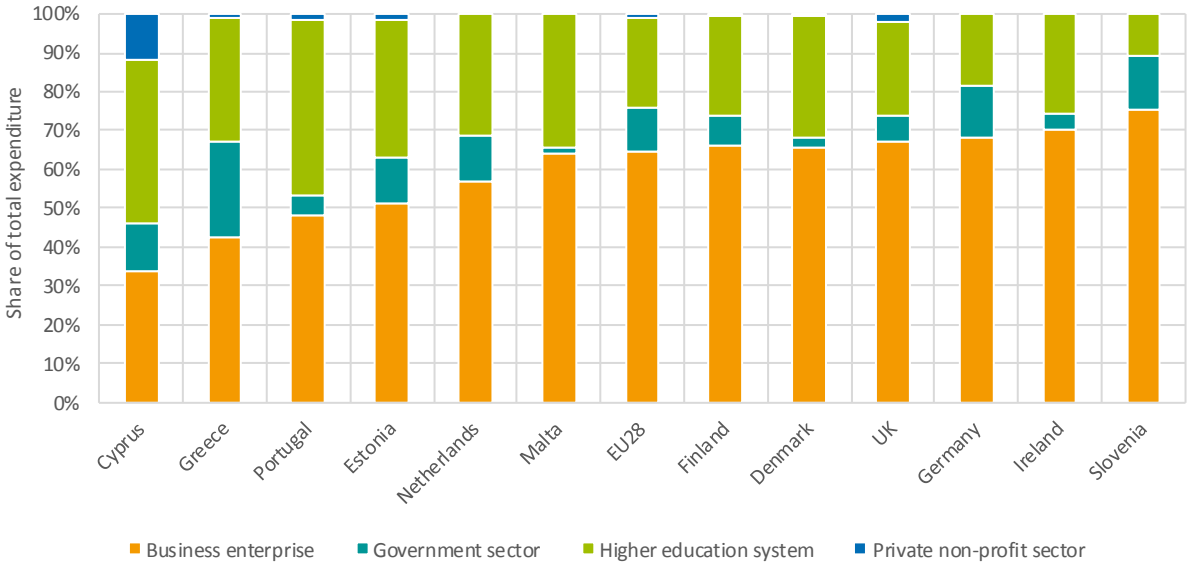
About 56 percent of R&D expenditures in Cyprus comes from the public sector (i.e. public administrations and universities), an exceptionally high share compared to other benchmark countries. (Figure 103) This means that, despite being small in absolute amounts, public R&D expenditures relative to GDP are around the same as many other benchmark countries. Conversely, the share of private R&D expenditures in GDP is extremely small. (Figure 104)

Figure 102 Intramural R&D expenditure by all sectors, 2017



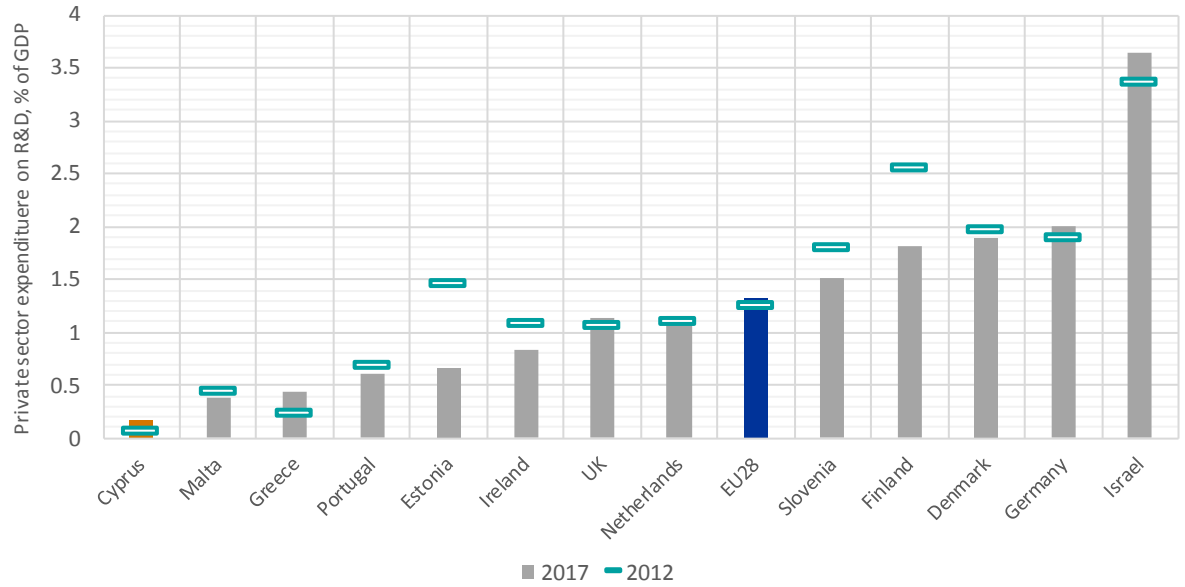
Source: Eurostat, Intramural R&D expenditure (Gross domestic expenditure on R&D – GERD) by sectors of performance and source of funds, [rd_e_gerdfund].

Figure 103 Intramural R&D expenditure by sector of performance, 2016



Source: Eurostat, Intramural R&D expenditure (GERD) by sectors of performance and source of funds [rd_e_gerdfund].

Figure 104 Private sector expenditure on R&D, 2012 and 2017



Source: European Commission, DG Internal Market, Industry, Entrepreneurship and SMEs, European Innovation Scoreboard.

Knowledge institutions

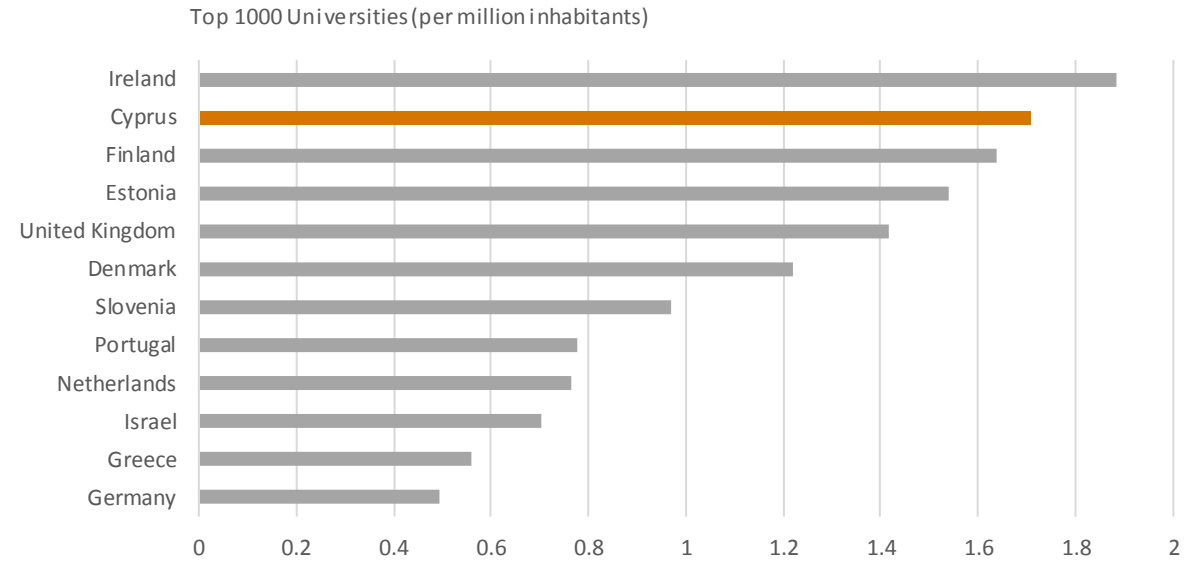
Cyprus has a total of eight universities, three of which are public. Two of the three public universities feature in the Times Higher Education World University Rankings lists of the global top 1,000 research-intensive universities: the Cyprus University of Technology (ranked between 351 to 400) and the University of Cyprus (ranked between 401 to 500). Among young universities, established in the last 50 years, Cyprus University of Technology ranks 59th and University of Cyprus ranks 64th. This is a respectable performance given the small size of Cyprus, and the young age of its universities. In fact, when adjusting for population size, Cyprus ranks among the best of the benchmark countries. (Figure 105)

The strength of Cyprus in academic research reflects the high share of research and development expenditures allocated to the higher-education sector. It also relates to the high share of tertiary education graduates, contributing to and reflecting the strength of universities in Cyprus. It is also the strength of universities and academic research that the newly created Research and Innovation Council under the Chief Scientist is seeking to exploit.

Description: Times Higher Education World University Rankings

The Times Higher Education World University Rankings lists the top 1,000 research-intensive universities in the world. The ranking is based on 13 performance indicators, covering four areas: teaching, research, knowledge transfer and international outlook.

Figure 105 Number of universities in the global Top 1000 per capita, 2017



Notes: Own calculations, dividing the number of Top 1000 Universities per country by the number of inhabitants.
Source: Times Higher Education, World University Ranking 2017.

Enterprise technology adoption and innovation activity

Cyprus has low rates of technology adoption by business. Relative to the benchmark countries, Cyprus has relatively few firms selling online. Few companies use enterprise resource-planning software, electronic invoicing or big data analytics. (Figure 106) These findings are consistent with the low levels of business sophistication highlighted earlier in the report. (Figure 80, Figure 84, Figure 85)

The World Economic Forum Executive Opinion Survey seems to confirm the assessment that Cyprus lags the benchmark countries. It reveals low levels of technology transfer through FDI. (Figure 107) Also, firms in Cyprus do not cooperate with academia as much as they do in other countries benchmark countries. (Figure 108) This suggests that there are barriers to translating Cyprus' excellence in academic research into innovation in the business sector.

The dominance of service sectors and the lack of large firms may contribute to the observed low technology adoption and innovation activity in Cyprus. When comparing the innovation performance of SMEs, Cyprus is much closer to, and even above, the EU average. (Figure 109)

Furthermore, a supportive legal framework for innovation helps promote technology transfer and cooperation. Intellectual property rights protection–on which Cyprus continues to improve (Figure 70 on page 80)–and legislation allowing universities to create spin-offs are, among others, all factors that influence technology adoption and innovation activities. At the same time, lagging technology adoption in the public sector (Figure 73 on page 82) may act as a drag on private-sector technology adoption and innovation activities.

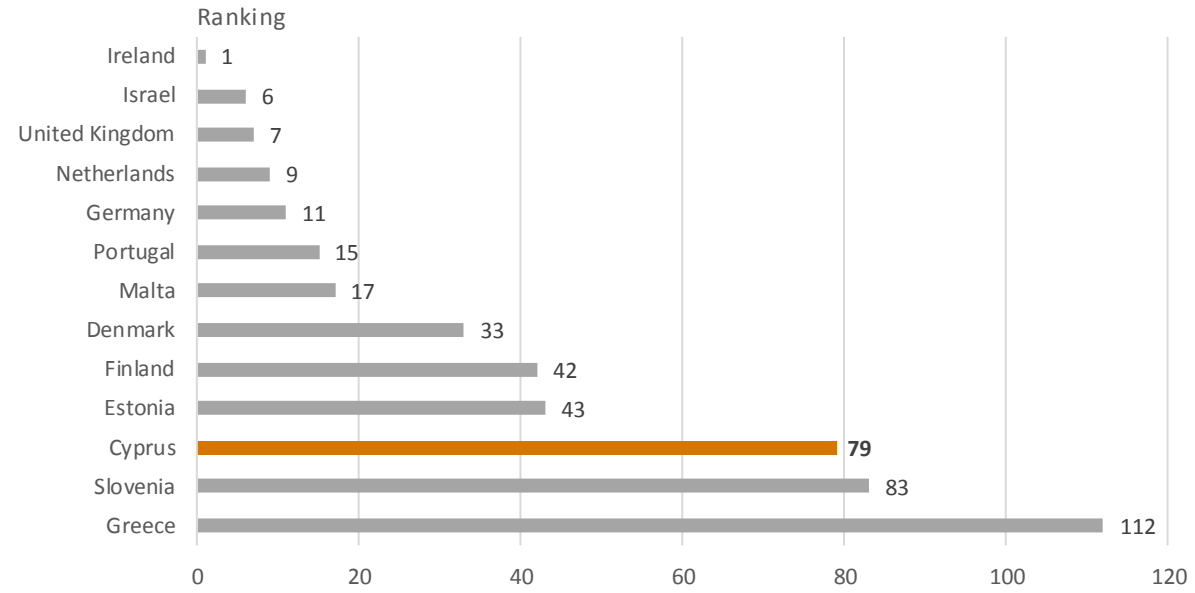
This situation is concerning, as a lack of adoption of digital technologies does not only affect productivity, but also reflects on the ability of firms to adapt and take advantage of opportunities presented by new trends and developments.

Figure 106 Enterprise technology adoption, 2017

	Enterprises selling online	Employees using computers	Enterprises using Resource Planning(ERP) software	Enterprises using electronic invoicing	Enterprises using big data analysis
Greece	11%	38%	37%	3%	11%
Portugal	18%	38%	40%	19%	13%
Cyprus	12%	42%	35%	6%	3%
Malta	17%	45%	30%	9%	19%
Estonia	16%	46%	28%	19%	na
EU28	18%	51%	34%	18%	10%
Ireland	30%	51%	28%	15%	na
Slovenia	18%	51%	30%	57%	11%
Germany	24%	54%	38%	16%	6%
United Kingdom	20%	57%	19%	5%	15%
Netherlands	16%	69%	48%	19%	19%
Finland	21%	70%	39%	72%	15%
Denmark	29%	73%	40%	64%	12%

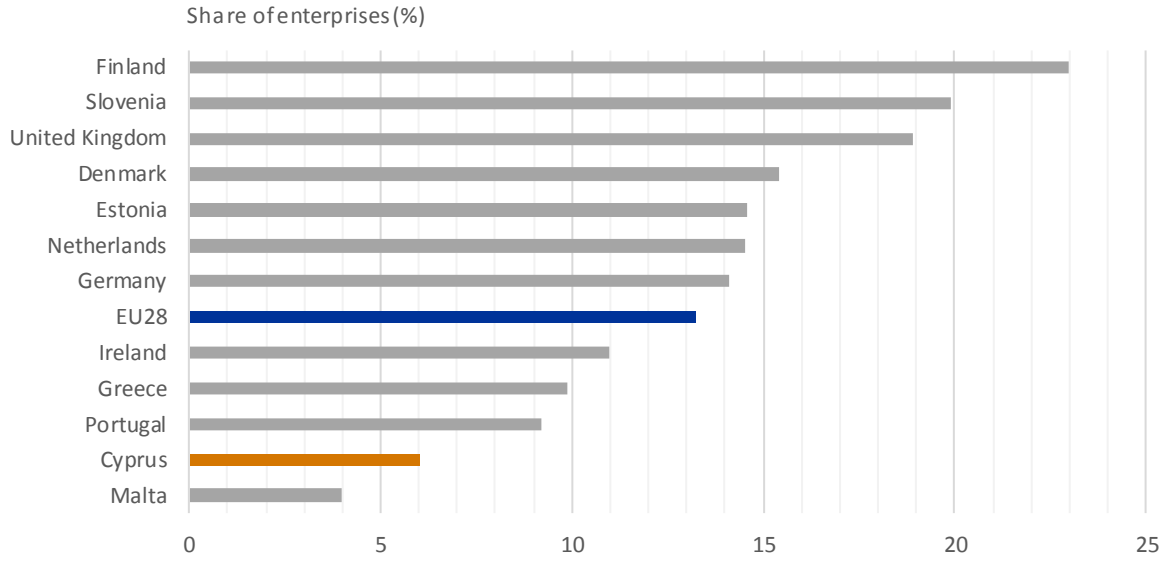
Notes: No information available for Estonia or Ireland for enterprises using big data analysis.
Source: Eurostat, *Enterprises selling online with at least 1 percent turnover* [tin00111], *Use of computers and the internet by employees* [isoc_ci_cm_pn2], *Enterprises who have ERP software package to share information between different functional areas* [isoc_eb_iip], *Enterprises sending e-invoices, suitable for automated processing* [isoc_eb_ic], *Big data analysis* [isoc_eb_bd].

Figure 107 FDI and technology transfers, 2017



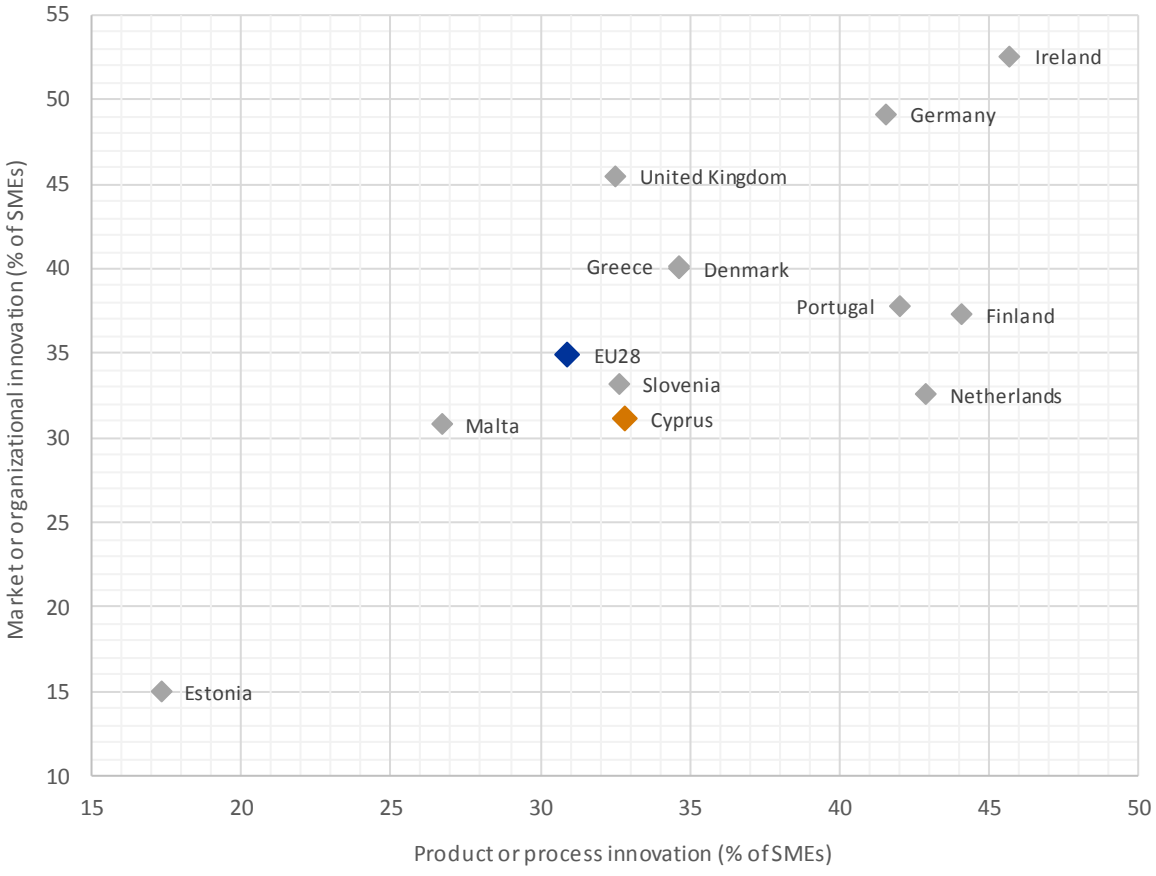
Notes: Survey question: To what extent does foreign direct investment (FDI) bring new technology into your country?
Source: World Economic Forum Global Competitiveness Reports 2017, 9.03 FDI and technology transfer.

Figure 108 Enterprises cooperating with academia, 2014



Source: RIO JRC, Enterprises cooperating with universities or other higher education institutions, 2014.

Figure 109 Innovative SMEs, 2017



Source: European Commission, DG Internal Market, Industry, Entrepreneurship and SMEs, European Innovation Scoreboard 2018, Percentage of SMEs introducing product or process innovation and Percentage of SMEs introducing marketing or organizational innovations.

7.3 Financial infrastructure

Financial infrastructure covers the institutions that provide access to finance and financial services. These include banks and other financial intermediaries, capital and financial service providers, insurance companies, and public institutions such as the Central Bank of Cyprus, the Cyprus Stock Exchange Commission, and the Insurance Companies Control Service.

Cyprus' membership in the Eurozone and the strong impact of the 2012-13 banking crisis are key considerations for the assessment of the financial infrastructure. Nonetheless, although the impact of the crisis is still being felt, the situation has improved in recent years and prospects are encouraging.

Findings from the World Economic Forum (WEF) Global Competitiveness Index illustrate the profound impact of the domestic banking crisis on perceptions of Cyprus' financial infrastructure. In 2011 and 2012, before the domestic banking crisis, *Financial market development* was assessed as a strong point of Cyprus' competitiveness, with the country ranked 25th out of 142 countries. However, even after recent improvements, Cyprus was in 108th position out of 137 countries in the WEF rankings for 2017-18. This is considerably worse than Cyprus' ranking in all other competitiveness pillars except *Market size* and *Macroeconomic environment*, the latter being closely linked to the situation of the financial sector. Moreover, availability of local equity financing and venture capital, which were relatively poorly evaluated even before the banking crisis, is an area of concern. (Figure 110 and Figure 111)

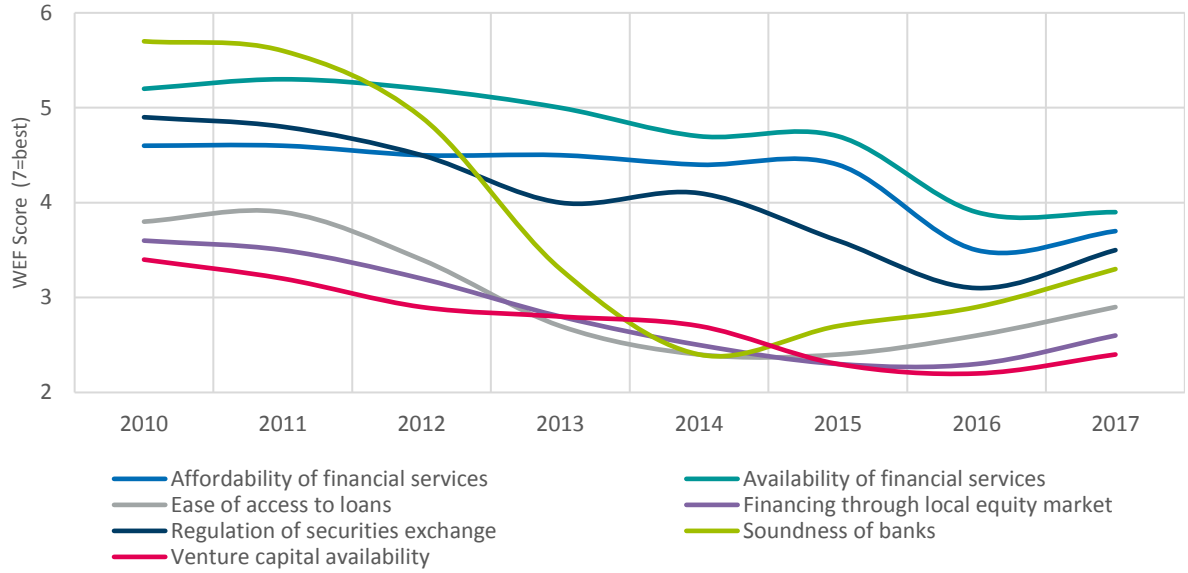
One important contributing factor is the very high ratio of domestic credit to GDP in Cyprus compared to the benchmark countries. Although the ratio has declined from more than 250 percent of GDP to 240 percent, it remains the highest of the benchmark countries which, combined with important volumes of non-performing loans, is a source of stress on the banking system. (Figure 112)

Definition: Financial Market Development Index (WEF)

The World Economic Forum (WEF) Executive Opinion Survey asks respondents to rate aspects of financial services and infrastructure using a scale from 1 (lowest) to 7 (highest). The individual survey questions are:

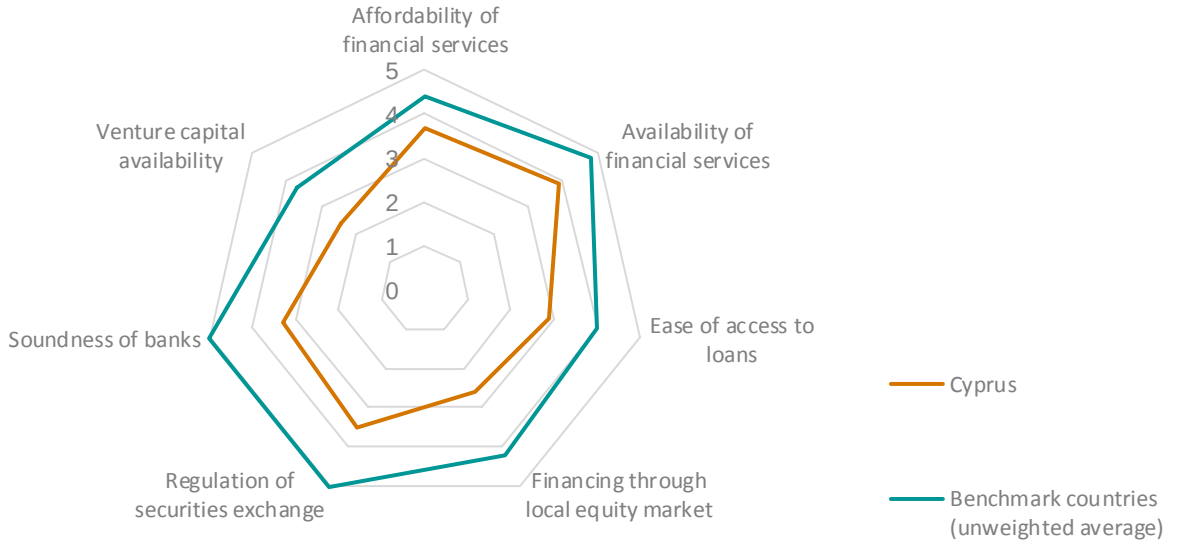
- **Affordability:** To what extent does competition among providers of financial services in your country ensure the provision of financial services at affordable prices?
- **Availability of financial services:** Does the financial sector in your country provide a wide variety of financial products and services to businesses?
- **Access to loans:** How easy is it to obtain a bank loan in your country with only a good business plan and no collateral?
- **Local equity market:** How easy is it to raise money by issuing shares on the stock market in your country?
- **Soundness of banks:** How would you assess the soundness of banks in your country?
- **Securities exchange regulation:** How would you assess the regulation of securities exchanges in your country?
- **Venture capital availability:** In your country, how easy is it for entrepreneurs with innovative but risky projects to find venture capital?

Figure 110 Cyprus financial market development, 2010-2017



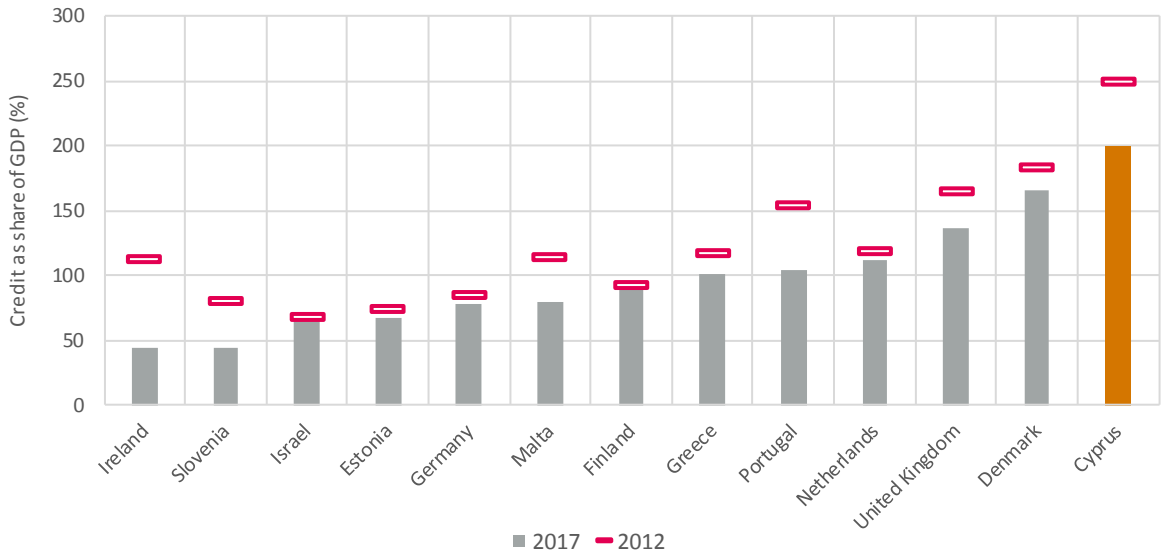
Note: No update is available for 2018, given significant methodological changes in the 2018 World Economic Forum Global Competitiveness Report.
Source: World Economic Forum, Executive Opinion Survey: 8th Pillar Financial Marker Development.

Figure 111 Cyprus financial market development by theme, 2017



Note: No update is available for 2018, given significant methodological changes in the 2018 World Economic Forum Global Competitiveness Report.
Source: World Economic Forum, Executive Opinion Survey: 8th Pillar Financial Marker Development.

Figure 112 Domestic credit to private sector, 2017



Source: World Bank Data, Domestic credit to private sector (% of GDP)

Access to Finance

Non-financial corporations face higher borrowing costs than many benchmark countries, with only Greece and Malta having higher costs. Interest rates for loans to business are more than double compared to Finland, Germany and the Netherlands, for example. These high borrowing costs could potentially place a burden on firms, especially smaller ones. However, these higher costs need to be placed in context, as the difference between Cyprus and the Eurozone average is not more than 170 basis points. Inflation in Cyprus is also slightly higher than the EU average, which also needs to be considered. Encouragingly, the borrowing cost for households remains relatively close to the average across the Eurozone and Cyprus scores better than most benchmark countries. (Figure 113)

The cost of resolving insolvency are one possible contributing factor to high borrowing costs in Cyprus. While Cyprus has made considerable progress in improving its insolvency framework, a lack of effective insolvency services and a slow judicial system means that Cyprus lags the EU average in terms of the cost of resolving insolvency (European Commission, 2017b).

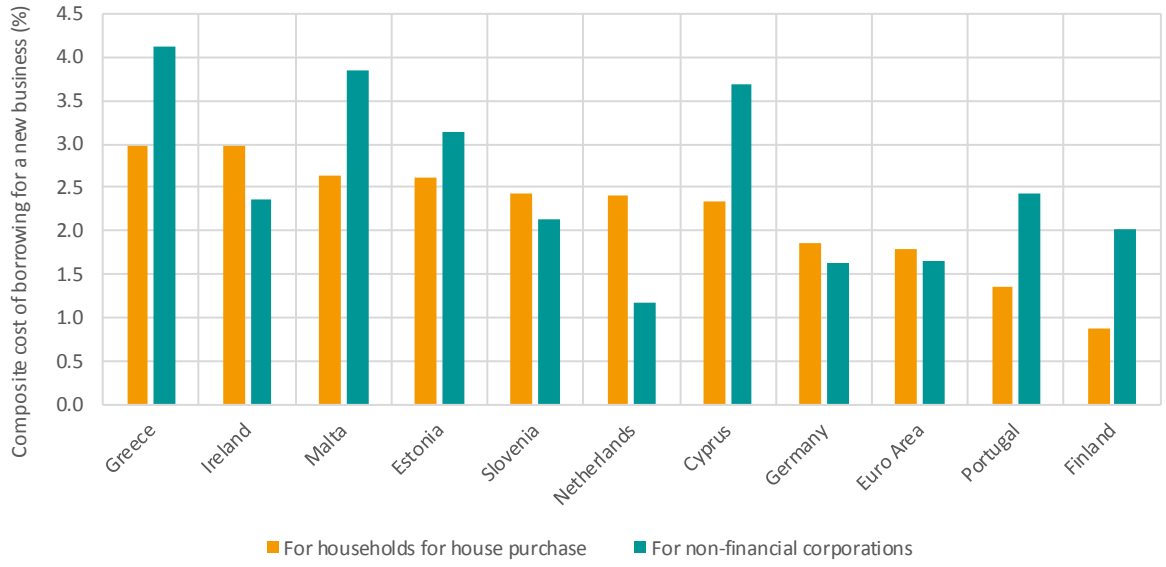
Cyprus is characterised by a lack of diversity of external funding sources used by firms. In contrast to other benchmark countries, almost all external finance in Cyprus comes in the form of bank loans or other forms of bank finance. Most lending is collateralized. The IMF (2017) indicates that two thirds of loans are collateralized against real estate.

Almost no external finance comes from, for example, issuance of bonds or equity, leasing or hire purchase, or factoring or invoice discounting. (Figure 114) Similarly, the stock exchange plays virtually no role in firm financing, with fewer than 10 non-financial companies being listed on the Cyprus stock exchange. (European Investment Bank, 2017)

Potential explanations for the reliance on bank financing include the dominance of SMEs or the small size of the Cypriot market. It is not clear, however, whether the lack of diversity results from a lack of alternative funding offers, or because firms are not willing or capable to access alternative funding sources. However, given high borrowing costs, it would be puzzling if firms did not seek out alternative funding sources, which may suggest that supply rather than demand is the main issue. This would align with the World Economic Forum perceptions survey, which found that the availability of financial services

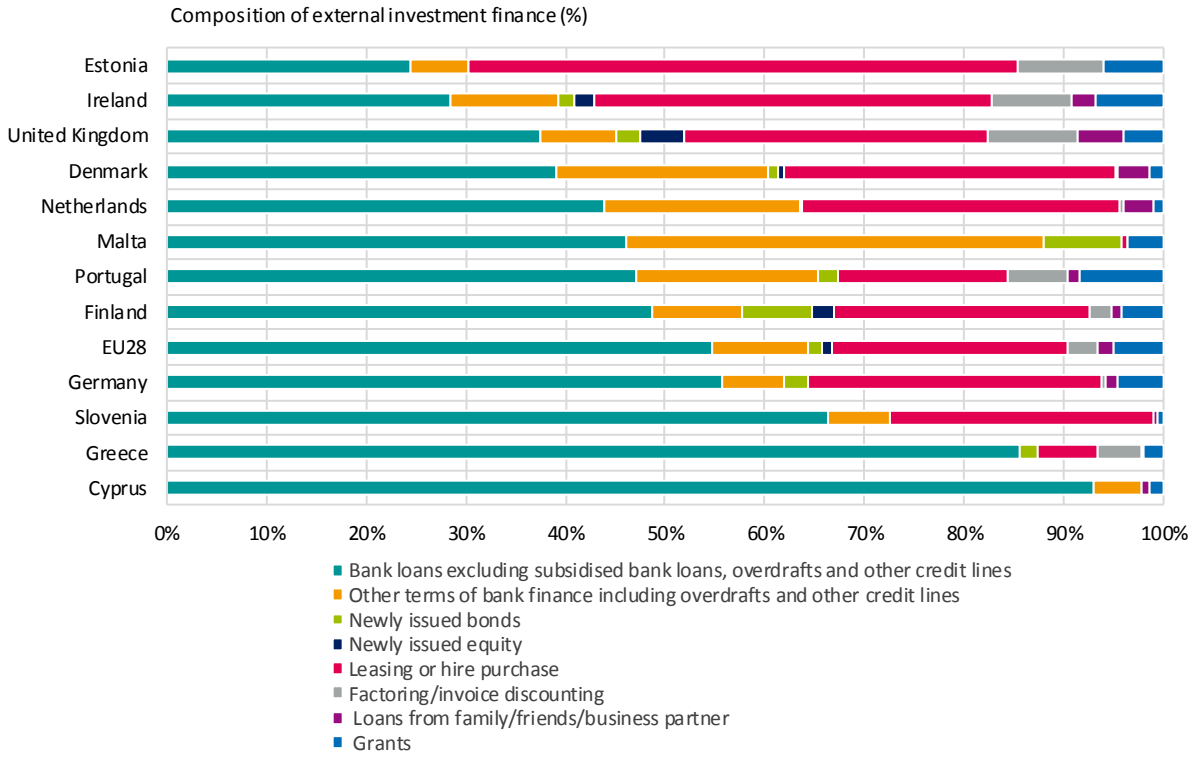
and of equity or venture capital financing had fallen during and after the banking crisis. (Figure 110)

Figure 113 Cost of borrowing for households and non-financial corporations, 2018



Note: No data for Denmark, Israel or the UK.
Source: European Central Bank: Composite cost of borrowing indicator, Sept. 2018.

Figure 114 Firm's sources of external finance, 2017



Source: European Investment Bank, Investment Survey: Composition of external investment finance, by source.

7.4 Productive and physical infrastructure

Productive and physical infrastructure refers to infrastructure such as transportation, utilities or telecommunications. It covers both hard and soft infrastructure, and, adopting a broad definition, also include outcomes such as connectivity. The extensiveness and quality of infrastructure can be measured in various ways. First, this includes the stock of and investment in infrastructure, with the latter also providing an outlook on the future stock of infrastructure. Secondly, the quality of infrastructure can be measured by indicators on costs, such as the cost of shipping a container, or indicators that directly measure quality, such as internet speed.

Transport

Measured by kilometres of road per capita, the road infrastructure in Cyprus is relatively extensive compared to most benchmark countries and is perceived to be of good quality according to the WEF Executive Opinion Survey. The high per-capita level of road infrastructure reflects a combination of the small geographical size of the country, the relatively high population density, and the clustering of population along an axis from Nicosia to Larnaca, and Limassol to Paphos. (Figure 115)

External connectivity provided by ports and airports is especially important to island economies such as Cyprus. While country size and geographical location influence the overall level of external connectivity, there is some evidence that Cyprus performs less well in terms of external connectivity and international transport infrastructure than some benchmark countries with a similar reliance on non-land-based trade connections.

In the maritime area, liner shipping connectivity for Cyprus is below that of geographically proximate countries such as Greece, Malta, and Israel. Furthermore, Cyprus has fallen behind: While in 2007 Cyprus was comparable to countries such as Denmark, Israel and Slovenia, since then these countries have improved, while Cyprus has worsened. (Figure 116)

In common with Slovenia, Malta, and Estonia, Cyprus achieves a low score in terms of the Airport Council International—Europe's Airport Industry Connectivity Index. This measure is, furthermore, affected by seasonal factors, as it is based on flight data for the third week of June which is high tourist season in Cyprus. Country size is an important explanation for connectivity, with larger countries such as the UK or Germany better connected than smaller countries such as Cyprus. In fact, on a per capita basis and relative to GDP, Cyprus is better connected than most benchmark countries. But while this explains low scores for air connectivity, it is the absolute level of connectivity that matters for travellers, and thus overall competitiveness. Importantly, these structural factors imply that it may be hard for policy makers and airport authorities to address weak connectivity. (Figure 117)

Despite Cyprus' low air connectivity score, over the last five years, Larnaca airport was among the European leaders in terms of connectivity improvements between 2017 and 2018. There are a large number of direct flights, many serving the tourism industry. Conversely, indirect connectivity, through connecting flights via third-country hubs is relatively weak compared to the benchmark countries. (Airports Council International, 2018) Regarding the efficiency of air services, the World Economic Forum perceptions survey places Cyprus ahead of Slovenia and Estonia, but below the other benchmark countries. (Figure 117)

Compared to the benchmark countries, Cyprus ranks towards the bottom in the World Bank Logistics Performance Index, only ahead of Malta. Underlying information behind this indicator identify weak spots in the ease of arranging competitively priced shipments, the competence and quality of logistics services, and the ability to track and trace

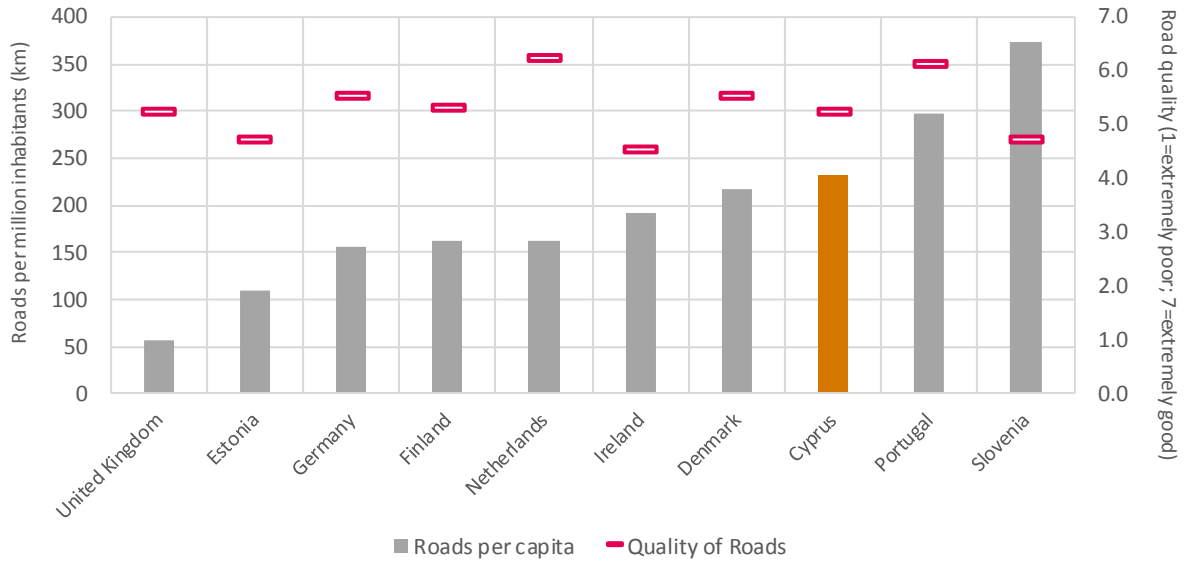
consignments. This suggest that soft infrastructure may matter as much as the physical infrastructure for delivering improvements in Cyprus' overall international logistics performance. (Figure 118)

Definition: International Logistics Performance Index (World Bank)

The World Bank Logistics Performance Index (LPI) benchmarks countries' performance on trade logistics across 160 countries. The LPI is based on a worldwide survey of operators on the ground (global freight forwarders and express carriers), providing feedback on the logistics "friendliness" of the countries in which they operate (domestic LPI) and those with which they trade (international LPI). Feedback from operators is supplemented with quantitative data on the performance of key components of the logistics chain in the country of work. The international LPI ranks countries on six dimensions of trade. They are:

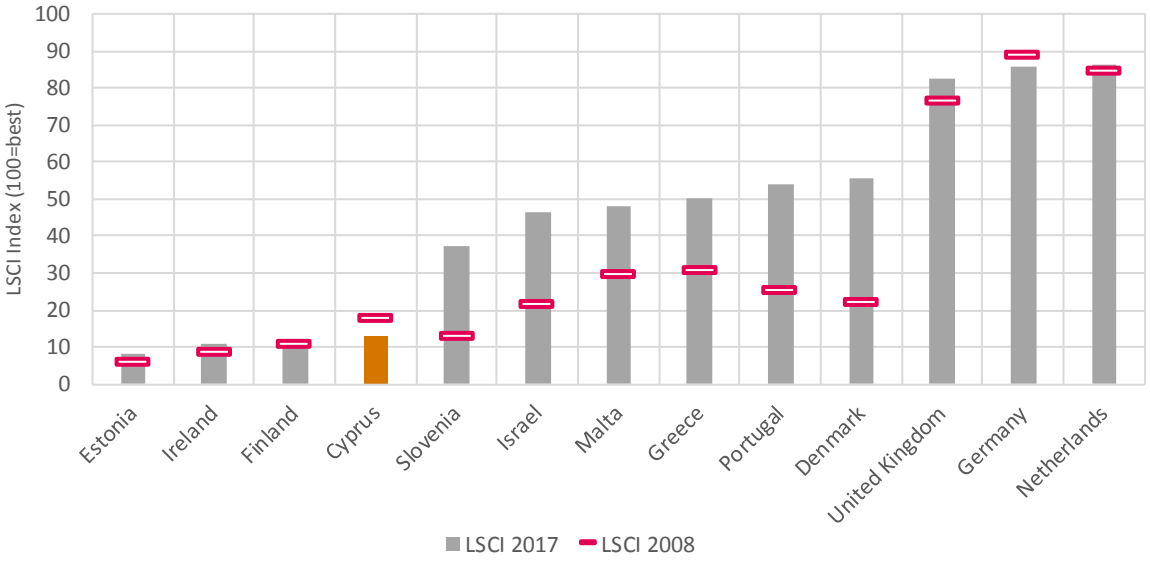
- **Customs:** The efficiency of customs and border management clearance;
- **Infrastructure:** The quality of trade and transport infrastructure;
- **Ease of arranging shipments:** The ease of arranging competitively priced shipments;
- **Quality of logistics services:** The competence and quality of logistics services—trucking, forwarding, and customs brokerage;
- **Tracking and tracing:** The ability to track and trace consignments;
- **Timeliness:** The frequency with which shipments reach consignees within scheduled or expected delivery times.

Figure 115 Road density and quality, 2016 and 2018



Notes: Data for kilometres of road not available for Greece and Malta.
Source: Eurostat, Length of motorways and e-roads [road_if_motorwa], 2016; World Economic Forum, Executive Opinion Survey, Global Competitiveness Report, 2018.

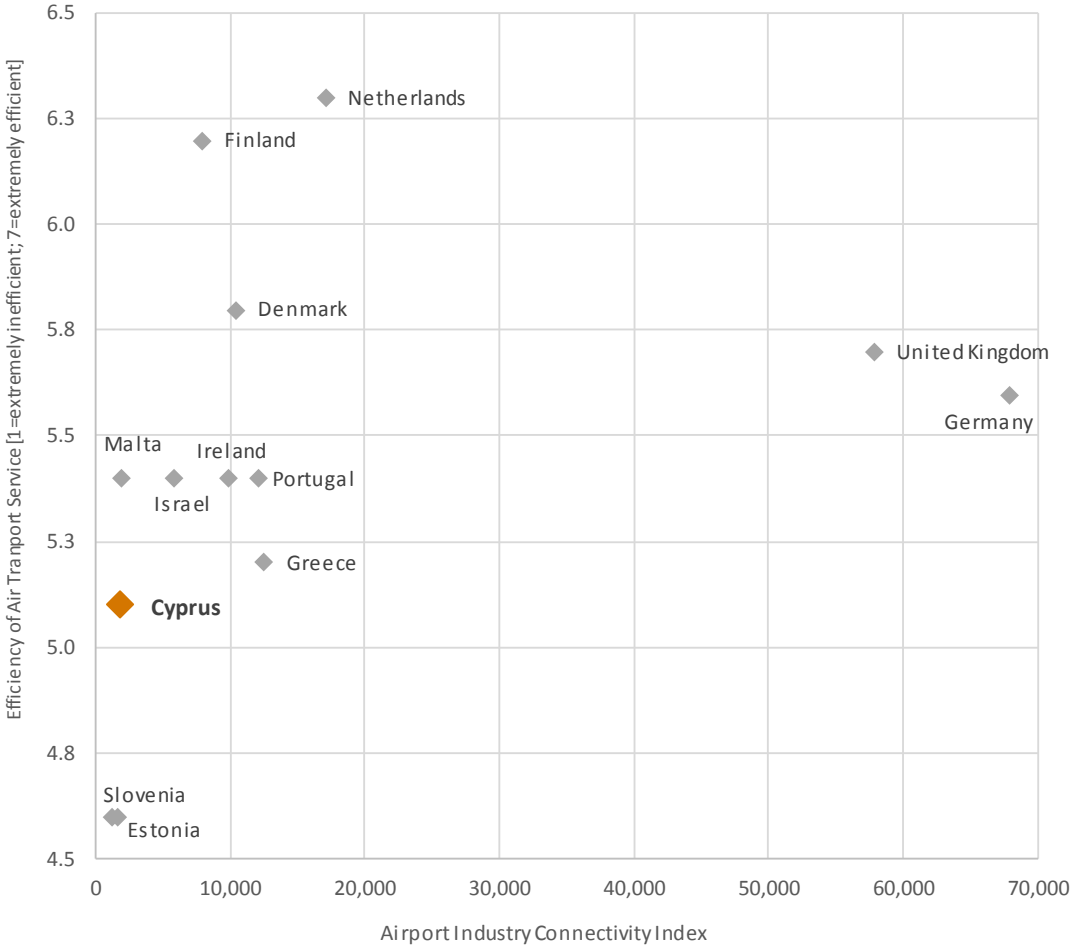
Figure 116 Liner Shipping Connectivity Index, 2008 and 2017



Notes: The liner shipping connectivity index is a composite index, based on five components of the maritime transport sector: number of ships, their container-carrying capacity, maximum vessel size, number of services, and number of companies that deploy container ships in a country's ports.

Source: United Nations Conference on Trade and Development (UNCTAD), Liner Shipping Connectivity Index.

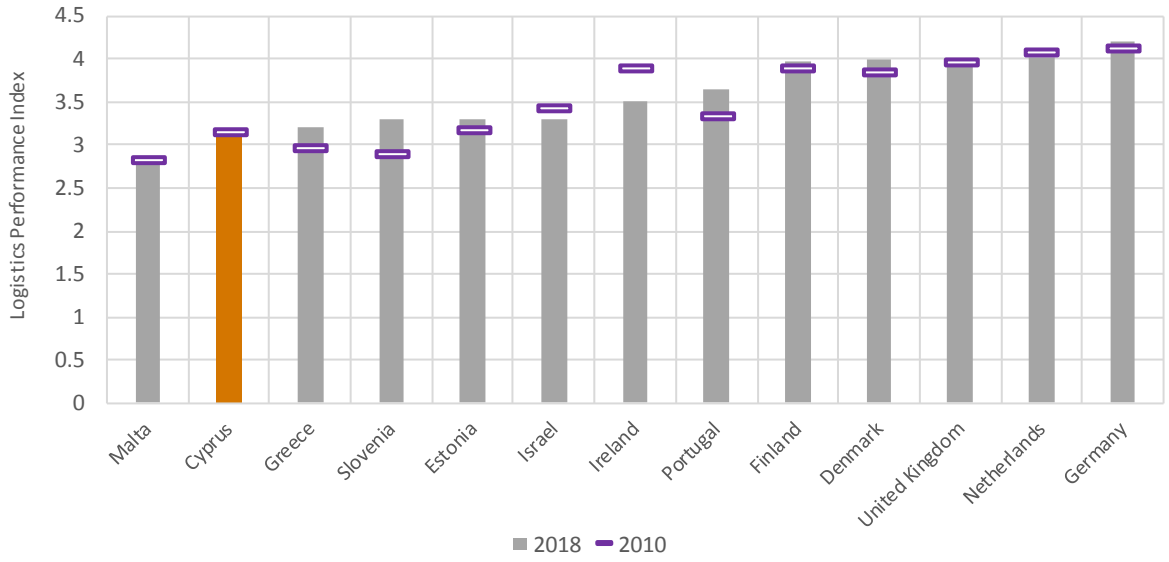
Figure 117 Air connectivity and efficiency of air transport services, 2017 and 2018



Notes: The Airport Industry Connectivity Index (AICI) measures the overall level to which an airport is connected to the rest of the World, either by direct flights or indirect connections via other airports. The index is a composite of the number of destinations, the frequency of services and the quality of connections (i.e. whether services are direct or via hubs).

Source: Airports Council International - Europe, Airport Industry Connectivity Index, 2017; World Economic Forum, Executive Opinion Survey, Global Competitiveness Report, 2018.

Figure 118 International Logistics Performance Index, 2010 and 2018



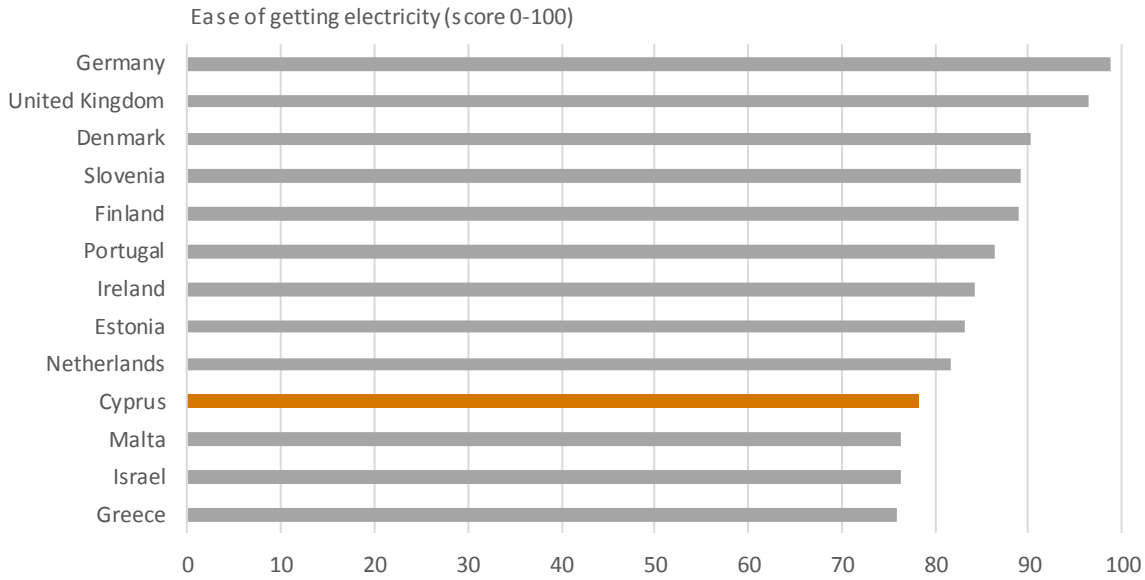
Source: World Bank, Logistics Performance Index, 2018.

Electricity

Cyprus achieves a low ranking among the benchmark countries for the ease of getting electricity supply, although differences compared to the benchmark countries are small. (Figure 119) Regarding the ease of getting electricity supply, the largest difference within the Doing Business indicator is with respect to the number of days that are required to obtain a permanent electricity connection. Taking on average 137 days, it significantly exceeds the OECD average of 77 days. (World Bank, 2019)

Perhaps more concerning are the high costs of electricity. As noted in Section 5.4 (Figure 56 on page 70) electricity prices in Cyprus are among the highest of the benchmark countries, mostly due to high costs of electricity generation.

Figure 119 Procedure, time and cost for getting electricity, 2018



Notes: Score of regulatory practice from 0 (worst) to 100 (best). The score captures the gap between an economy's current performance and a measure of best regulatory practice set in the 2015 Doing Business report.
Source: World Bank, Doing Business: Getting electricity, 2019.

ICT infrastructure

The International Telecommunications Union's ICT Development Index, which provides a broad composite measure of telecommunication infrastructure that captures ICT readiness, intensity and capability, ranks Cyprus ahead of Portugal, Greece and Slovenia and gives the country an overall score comparable with Malta, Israel and Finland. (Figure 120)

With fixed and mobile phone subscriptions in line with benchmark countries (Figure 121), and high levels of educational attainment, sources of weakness in Cyprus' performance are linked to internet and computer access and usage. Internet bandwidth seems to be a one problem area, with Akamai's State of the Internet Connectivity Report placing Cyprus well below all benchmark countries. Small market size or the peripheral location do not seem to explain this outcome, as countries such as Malta provide significantly higher internet speeds. (Figure 122)

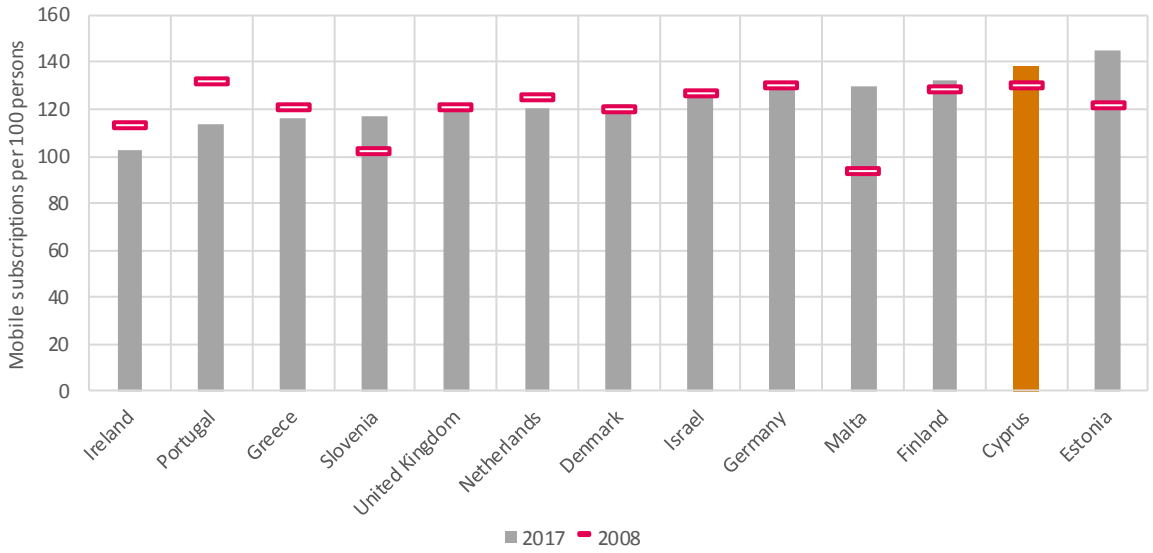
The European Commission's Digital Economy and Society Index also finds that connectivity is a weak spot for Cyprus, along with human capital (i.e. digital skills), which are both below the EU average. (Figure 123) Potentially, this creates the possibility of a negative cycle, whereby low internet speeds, low broadband penetration and high prices create a barrier to digital adoption and acquisition of digital skills and, conversely, low digital adoption and acquisition of digital skills constrain demand for broadband internet and hence restrict incentives for suppliers to roll-out infrastructure investments and services.

Figure 120 ICT Development Index, 2017

Notes: The ICT Development Index (ICT-DI), captures ICT readiness, intensity and capability. ICT readiness includes fixed and mobile phone subscriptions, international internet bandwidth, and the computer use and internet access in households. ICT intensity includes the use of internet by households, and fixed and wireless broadband subscriptions. ICT capability, which is given less weight than the first two sub-indices, is proxied by the literacy rate and secondary and tertiary educational attainment.

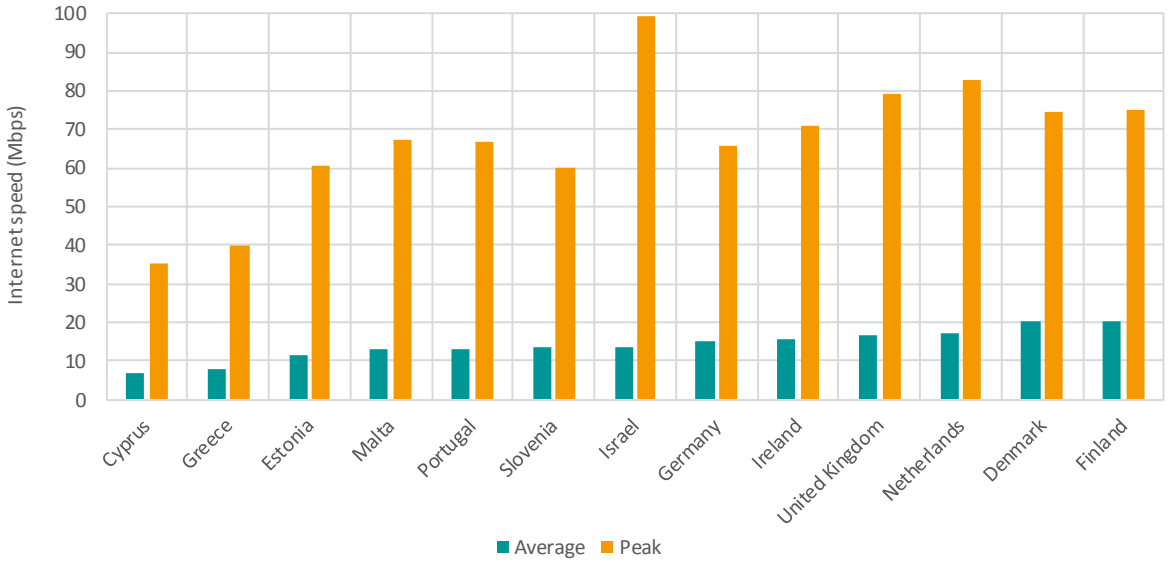
Source: United Nations International Telecommunications Union, ICT Development Index (IDI), 2017.

Figure 121 Mobile-cellular telephone subscriptions, 2008 and 2017



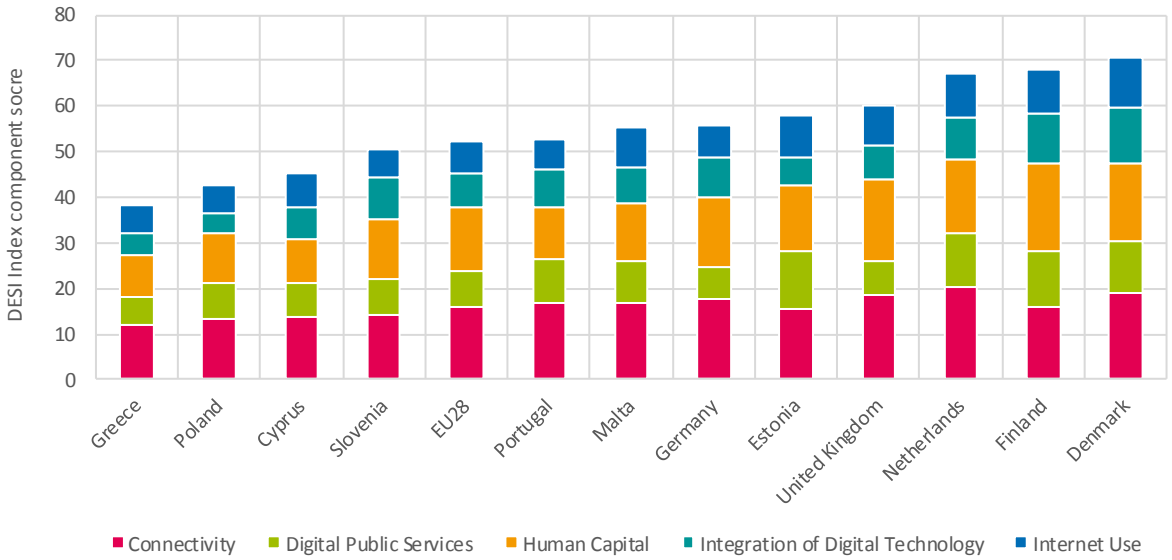
Source: World Bank, Development Indicators: Mobile cellular subscriptions (per 100 people) [IT.CEL.SETS.P2].

Figure 122 Average and average peak internet connection speed, 2017



Notes: Internet speed estimates are gathered from access statistics of the Akamai Intelligent Platform, a distributed cloud computing platform.
Source: Akamai, State of the Internet Connectivity Report 2017.

Figure 123 Digital Economy and Society Index, 2017



Notes: The Digital Economy and Society Index (DESI) is based on about 30 indicators, in five dimensions: connectivity, human capital, use of internet services, integration of digital technology, and digital public services.
Source: European Commission, Digital Scoreboard, Digital Economy and Society Index (DESI).

8 Social and environmental sustainability

Social and environmental sustainability are important societal objectives. But they are also important preconditions for achieving and maintaining competitiveness in the long-term. Social sustainability is still strongly affected by the aftermath of the 2012-13 banking crisis, with high rates of unemployment, risk of poverty, and inequality. At the same time, at least compared to the benchmark countries, Cyprus is performing well in gender equality.

In comparison to the benchmark countries Cyprus' ecosystem vitality and, to a lesser extent, environmental health is weak. This is concerning given the implications for the attractiveness and viability of Cyprus as a tourism destination. Cyprus is not in a position to affect global environmental issues such as climate change or marine depletion. At the same time, those areas that public policy in Cyprus can strongly affect are equally concerning: the share of renewable energy in total energy consumption is low, as is the recycling rate and the share of waste not going to landfill deposits.

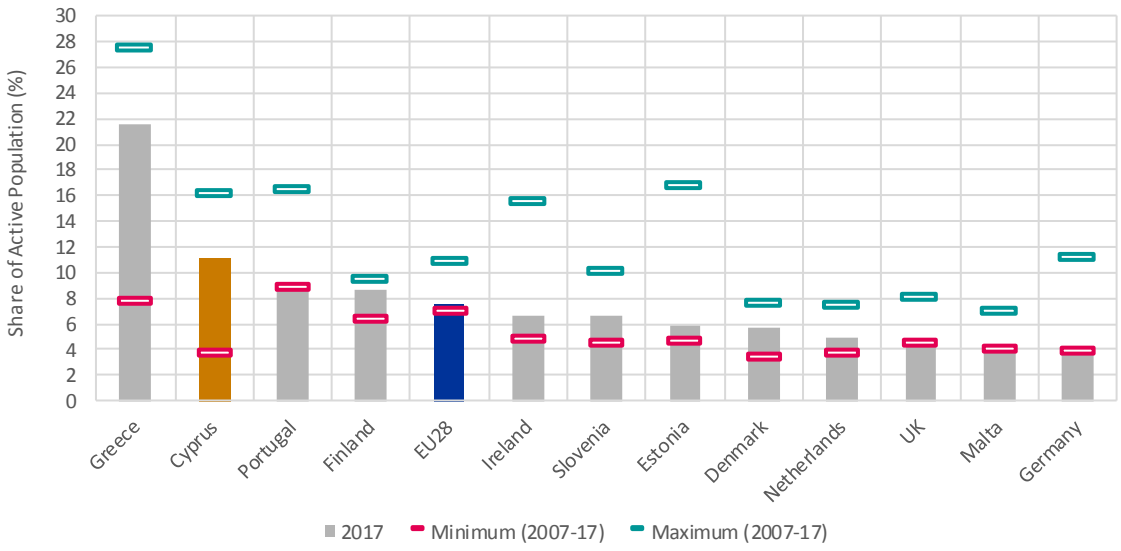
8.1 Social performance

Indicators of social performance presented a mixed picture for Cyprus compared to the benchmark countries and compared over time. In general, the global financial and economic crisis and the domestic banking crisis negatively impacted on indicators of social performance for Cyprus, but recent economic recovery has reversed this deterioration.

Unemployment

While unemployment in 2017 was still above the EU average and all benchmark countries except for Greece, it has significantly improved in recent years. As described in Section 3.2, unemployment in Cyprus has been falling since 2014, as the local and European economies have strengthened. The unemployment rate has continued to converge towards the EU28 average in 2018. (Figure 124)

Figure 124 Unemployment rate, 2017



Source: Eurostat, Labour Force Survey: Unemployment [une_rt_a].

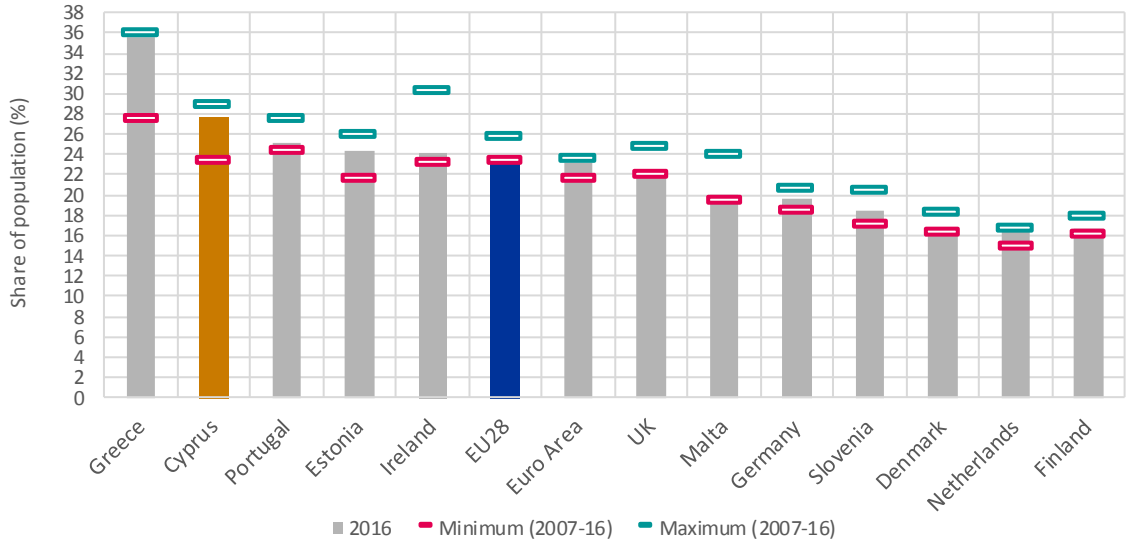
Risk of poverty and social exclusion

The share of Cyprus' population deemed to be at risk of poverty or social exclusion, which rose above the EU average in 2012, was the second highest among the benchmark countries in 2017, though it has continued to decline in line with Cyprus' recent robust economic growth. (Figure 125).

Definition: at risk of poverty or social exclusion

At risk of poverty or social exclusion, abbreviated as AROPE, refers to the situation of people either at risk of poverty, or severely materially deprived, or living in a household with a very low work intensity. The AROPE rate measures the share of the total population that is at risk of poverty or social exclusion.

Figure 125 People at risk of poverty or social exclusion, 2016



Source: Eurostat: People at risk of poverty or social exclusion by age and sex [ilc_peps01].

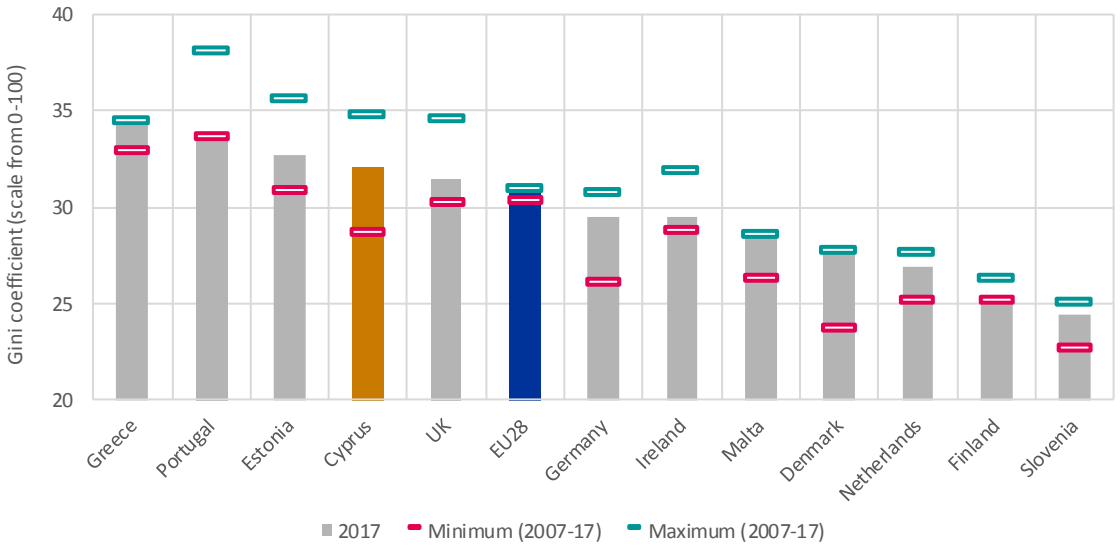
Income inequality

Compared with the indicator of persons at risk of poverty or social exclusion, Cyprus scores better for income inequality, with less measured income inequality than Greece, Portugal and Estonia. Despite some fluctuations in income inequality between 2007 and 2017, there is also considerable improvement in recent years. (Figure 126)

Definition: Gini coefficient

The Gini coefficient measures the extent to which the distribution of income within a country deviates from a perfectly equal distribution. A coefficient of 0 expresses perfect equality where everyone has the same income, while a coefficient of 100 expresses full inequality where only one person has all the income. The Gini coefficient of equalised disposable income measures the extent to which the distribution of equalised disposable income after social transfers deviates from a perfectly equal distribution.

Figure 126 Gini coefficient of equivalised disposable income, 2017



Source: Eurostat: Gini coefficient of equivalised disposable income (EU-SILC survey) [ilc_di12].

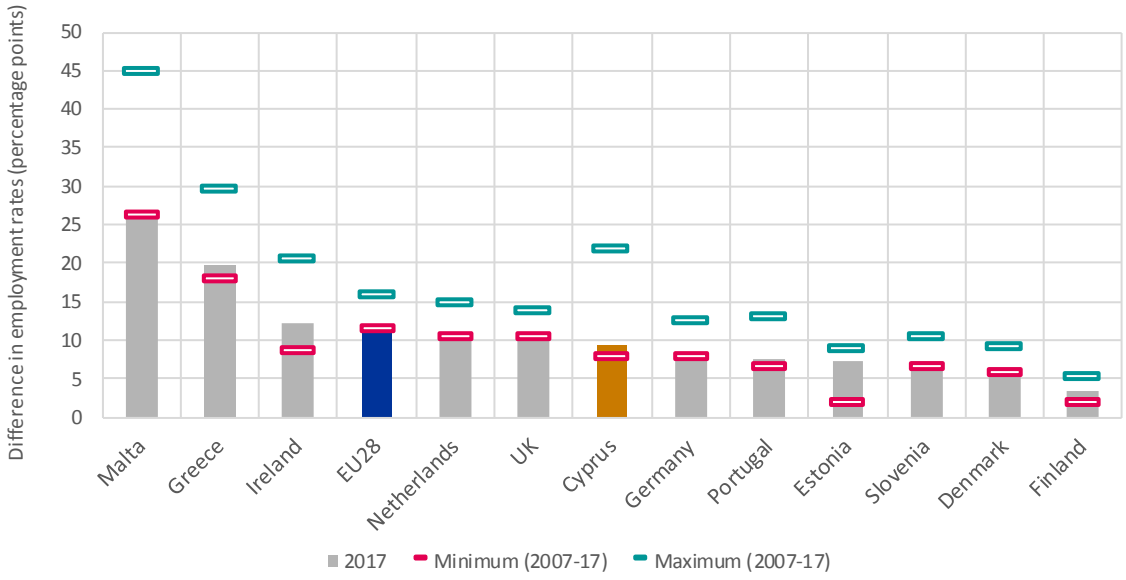
Gender employment gap

In terms of its gender employment gap, Cyprus performs relatively well. The gap in the employment rate between men and women in Cyprus is below the EU average and closer to Northern European countries than the high levels observed in Malta, Greece and Ireland. (Figure 127)

Definition: gender employment gap

The gender employment gap is defined as the difference between the employment rates of men and women aged 20-64 (i.e. the employment rate for men less the employment rate for women). The employment rate is calculated by dividing the number of persons aged 20 to 64 in employment by the total population of the same age group.

Figure 127 Gender employment gap, 2017



Source: Eurostat, Labour Force Survey: Gender employment gap [tesem060].

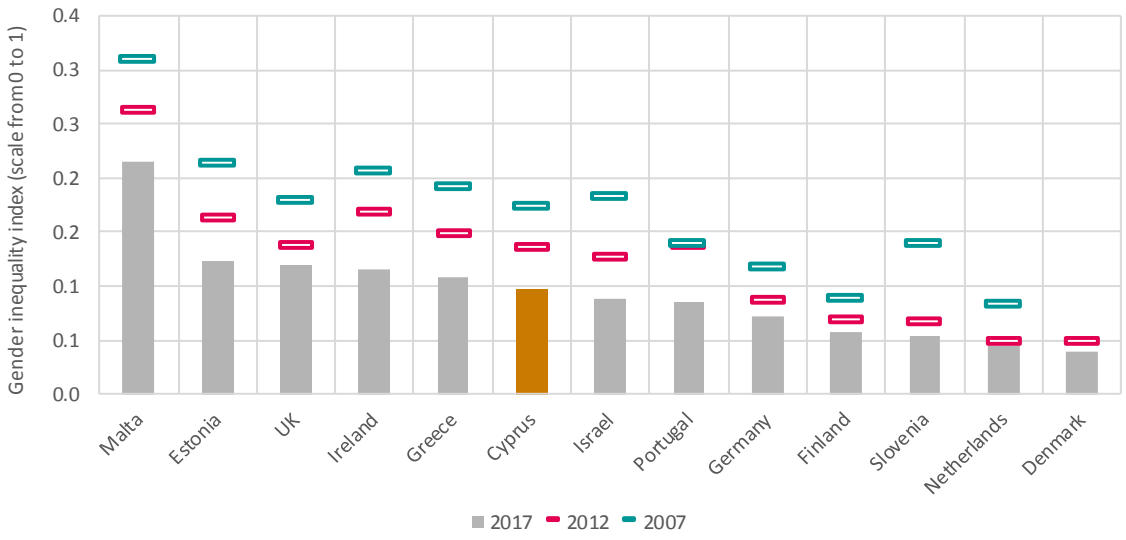
Gender inequality index

Cyprus performs reasonably well under the UNDP's Gender Inequality Index (GII), which is a broader composite index of gender equality. Although behind several of the North European benchmark countries, Cyprus outperforms Malta, Estonia, the UK and Ireland. (Figure 128).

Definition: Gender Inequality Index

The Gender Inequality Index measures gender inequalities in three important aspects of human development: reproductive health, measured by maternal the mortality ratio and adolescent birth rates; empowerment, measured by the proportion of parliamentary seats occupied by women and the proportion of adult women and men aged 25 years and older with at least some secondary education; and economic status, expressed as labour-market participation and measured by the labour force participation rate of women and men aged 15 years and older. The Gender Inequality Index ranges between 0 and 1: higher GII values indicate higher inequalities.

Figure 128 Gender Inequality Index, 2005, 2012 and 2017



Notes: Data for Demark in 2007 not available.
Source: UNDP, Gender Inequality Index (GII).

8.2 Resource use and environmental performance

Overall environmental performance

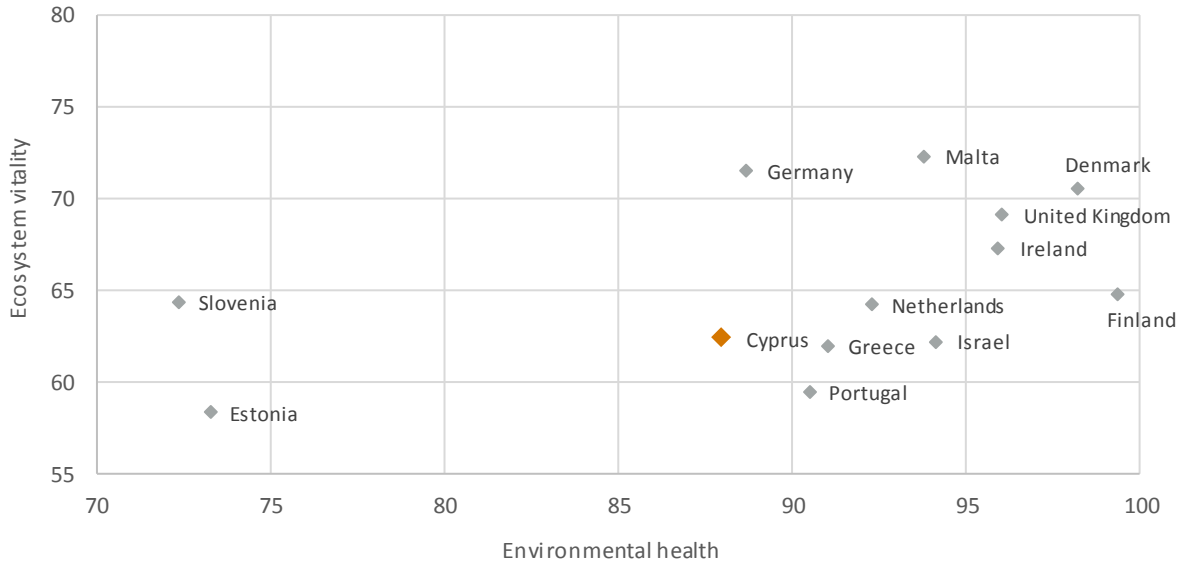
The Environmental Performance Index—a broad composite measure of environmental health and ecosystem vitality—ranks Cyprus 24th of 180 countries and 13th of the 28 EU member states. Cyprus has a global rank of 25 for the environmental health sub-index and 43 for the ecosystem vitality sub-index. Overall, Cyprus performs well in global terms but is poorly positioned in comparison to many of the selected benchmark countries.

Cyprus' relatively low position for ecosystem vitality is concerning given potential implications for the attractiveness of Cyprus as a tourism destination, and the need to maintain a balance between exploiting ecological resources (e.g. eco-diversity, habitat or water resources) for tourism purposes while preserving ecosystem vitality. (Figure 129)

Definition: Environmental Performance Index

The Environmental Performance Index is a composite index measuring environmental health and ecosystem vitality. Environmental health is assumed to rise with economic growth and prosperity. It includes indicators such as access to drinking water, water quality and air quality. Conversely, ecosystem vitality is assumed to come under strain from industrialization and urbanization, and includes indicators such as water resources, forestry and fisheries resources, and biodiversity. The index is scaled to be between 0 and 100, with 100 indicating a better performance.

Figure 129 Environmental Performance Index, 2017



Source: Yale Center for Environmental Law and Policy and Center for International Earth Science Information Network: Environmental Performance Index.

Greenhouse gas emissions and energy intensity

Cyprus has made progress in reducing man-made greenhouse gas emissions per capita and its energy intensity relative to GDP but, nonetheless, remains in the top half of the benchmark countries. (Figure 130 and Figure 131). A contributing factor to Cyprus' relatively high emissions has been a rapid increase in energy demand. Cyprus saw the biggest rate of increase in energy demand among EU member states, growing 41 per cent from 1.6 to 2.3 million tonnes of oil equivalent between 1990 and 2015.

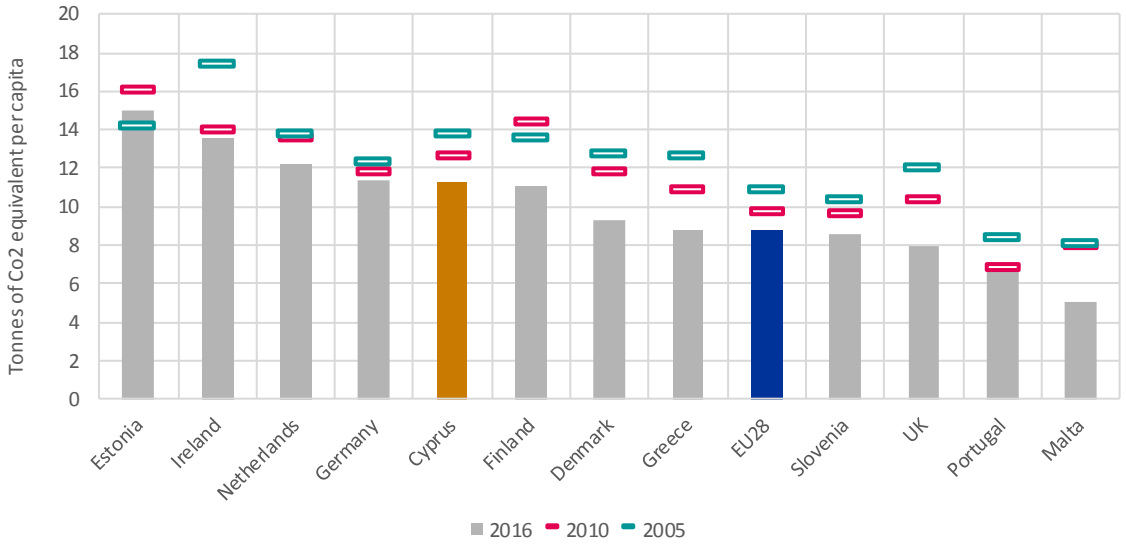
Definition: Greenhouse gas emissions

The Greenhouse gas emissions indicator shows man-made emissions of the 'Kyoto basket' of greenhouse gases that includes: carbon dioxide, methane, nitrous oxide, and the so-called F-gases These gases are aggregated into a single unit using gas-specific global warming potential factors and expressed in units of CO2 equivalents. The indicator does not include emissions and removals related to land use, land-use change and forestry, nor does it include emissions from international maritime transport. It does include emissions from international aviation as well as indirect CO2 emissions. CO2 emissions from biomass with energy recovery are not included in national greenhouse gas totals.

Definition: Energy intensity

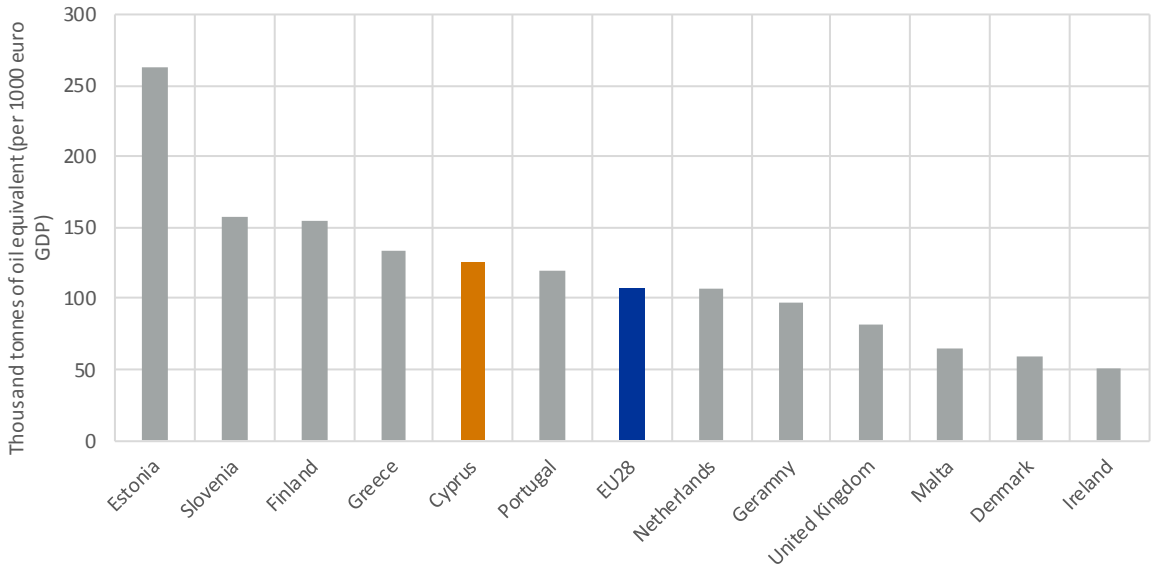
Energy intensity is calculated based on Eurostat Energy Balances and GDP data, and is expressed as gross inland consumption of energy in tonnes of oil equivalent (TOE) relative to gross domestic product.

Figure 130 Greenhouse gas emissions, 2005, 2010 and 2016



Source: Eurostat: Greenhouse gas emissions per capita [t2020_rd300].

Figure 131 Energy intensity, 2016



Source: Eurostat, Simplified energy balances - annual data [nrg_100a] and GDP and main components (output, expenditure and income) [nama_10_gdp].

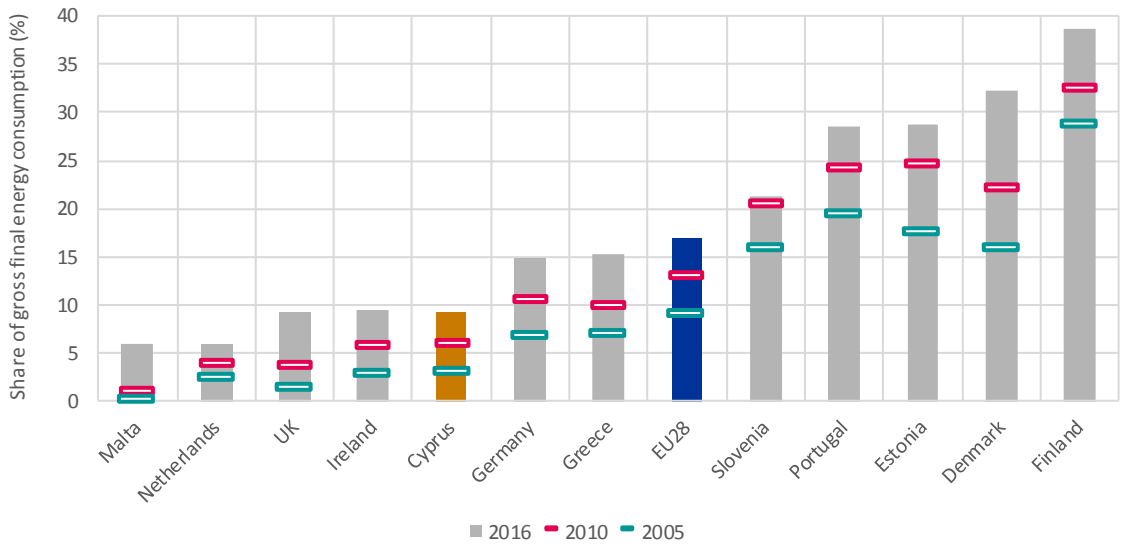
Renewable energy

Cyprus' dependency on fossil fuels for energy is the highest in the EU. In 2016, Cyprus' renewable energy share was 9.3 percent placing it in the 5th lowest position among the benchmark countries, ahead of Ireland, the UK, the Netherlands and Malta, but some distance behind Germany and Greece. Although Cyprus appears on track to reach the target (13 percent of gross final energy consumption) by 2020, there may be some concern that continued strong economic growth may undermine achieving this objective. (Figure 132)

Definition: Renewable energy in gross final energy consumption

This indicator shows the share of renewable energy consumption in gross final energy consumption according to the Renewable Energy Directive. The gross final energy consumption is the energy used by end consumers (final energy consumption) plus grid losses and self-consumption of power plants.

Figure 132 Renewable energy in gross final energy consumption for selected countries, 2005, 2010 and 2016



Source: Eurostat: Share of renewable energy in gross final energy consumption [t2020_rd330].

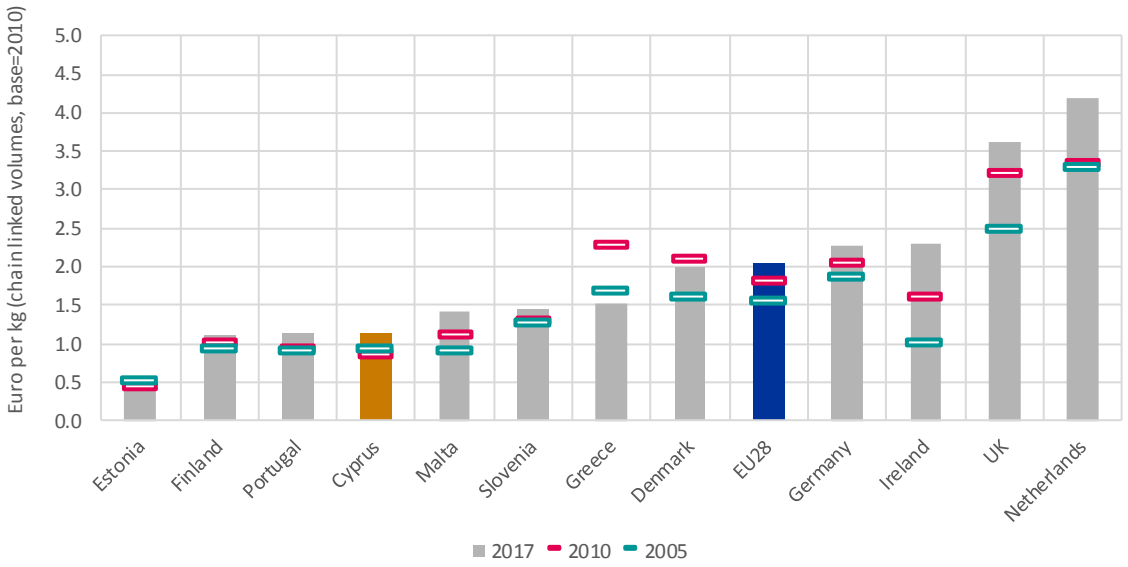
Resource productivity

Cyprus' resource productivity is below the EU average. During the period between 2012 and 2017, Cyprus achieved strong growth in resource productivity—measured as domestic material consumption (DMC) per euro of (real) GDP—moving it from the 25th to the 4th ranked Member State in terms of real growth in resource productivity since 2000. (Figure 133)

Definition: Resource productivity

Resource productivity is measured as gross domestic product (GDP) divided by domestic material consumption (DMC). DMC measures the total amount of materials directly used by an economy and covers the quantity of raw materials extracted from the domestic territory, plus all physical imports minus all physical exports. The term 'consumption', as used in DMC denotes apparent consumption and not final consumption.

Figure 133 Resource productivity (GDP divided by domestic material consumption), 2005, 2010 and 2017



Source: Eurostat: Resource productivity and domestic material consumption [sdg_12_20].

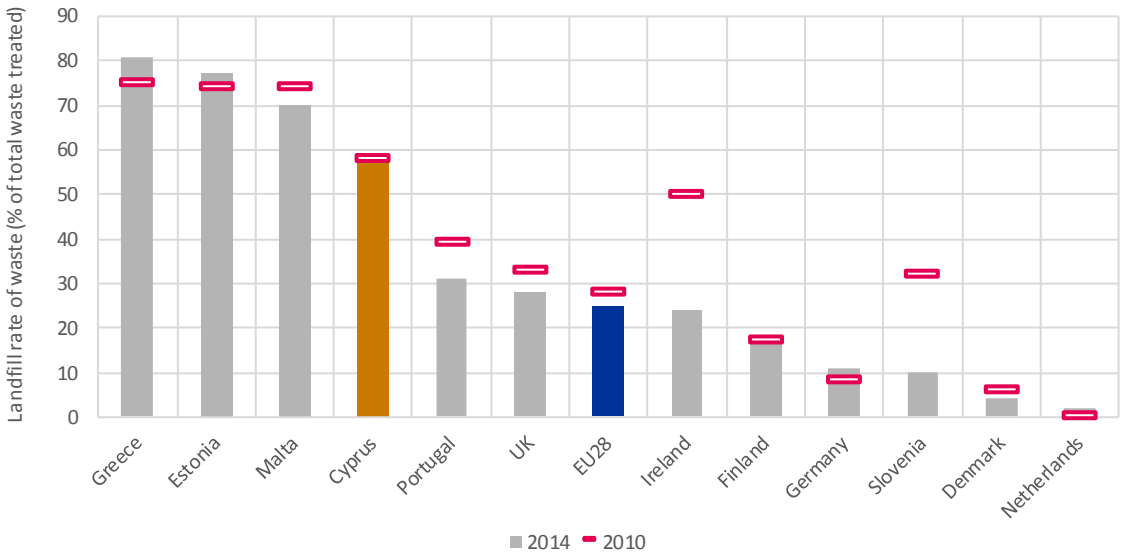
Waste management: Landfill

A high proportion of waste in Cyprus goes to landfill. Nearly 60 percent of non-mineral waste went to landfill in 2014, compared to an EU average of around one quarter. The situation has been exacerbated by rising tourism in recent years that have increased pressure on waste disposal systems on the island (Figure 134).

Definition: Landfill rate of waste

The Landfill rate of waste indicator is defined as the volume of waste landfilled (directly or indirectly) in a country per year divided by the volume of the waste treated in the same year. The data excludes waste that is imported from non-EU countries. The measurement of waste excludes mineral waste from construction and demolition, other mineral wastes, soils and dredging spoils. The indicator covers landfilling of hazardous and non-hazardous waste from all sectors and from households, including waste from waste treatment but excluding most mineral waste, and waste going into pre-treatment activities (like sorting, drying).

Figure 134 Landfill rate of waste (excluding major mineral wastes), 2010 and 2014



Source: Eurostat: Landfill rate of waste excluding major mineral wastes [t2020_rt110].

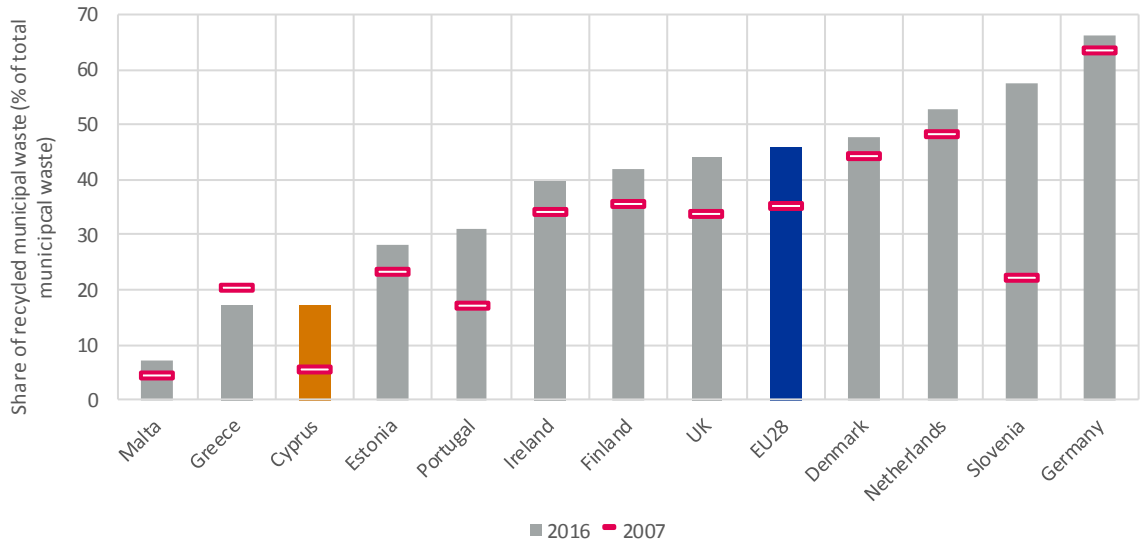
Waste management: Recycling rate

Mirroring the low landfill rate of waste, Cyprus' recycling rate is also low, placing it below all benchmark countries, except Greece and Malta. At the same time, the situation has considerably improved in recent years, with the recycling rate more than tripling from 5 to 17 percent between 2007 and 2016. (Figure 135)

Definition: Recycling rate of municipal waste

The Recycling rate of municipal waste indicator measures the tonnage recycled from municipal waste divided by total municipal waste. Recycling includes material recycling, composting and anaerobic digestion. Municipal waste consists mostly of waste generated by households but may also include wastes generated by small businesses and public institutions and collected by the municipality. For areas not covered by a municipal collection, the amount of waste is estimated.

Figure 135 Recycling rate of municipal waste, 2007 and 2016



Source: Eurostat: Recycling rate of municipal waste [sdg_11_60].

9 Competitiveness of the ICT services sector

Information and communications technology (ICT) services concern those service activities *intended to enable or fulfil the function of information processing and communication*. It is an emerging sector in Cyprus, with the turnover of the sector having grown from €1.1 billion in 2008 to more than €2.8 billion in 2016. The growth of ICT services is mostly due to computer programming and consultancy. The ICT ecosystem in Cyprus is also emerging. Cypriot universities already offer a large variety of ICT-related study programmes in ICT disciplines, and host various digital innovation hubs such as the KIOS research and innovation centre. There are also various incubators and accelerators providing support to ICT start-ups.

In general, public policy supports the ICT services sector. In particular, the Digital Strategy for Cyprus sets out a comprehensive agenda for promoting ICT use in all sectors of the economy. Where improvements could be made are in the coordination and acceleration of policy implementation, the promotion of digital skills, the promotion of foreign direct investment in ICT services, the provision of digitalisation incentives for key sectors of the economy, and the forward-looking provision of a regulatory framework for new, game-changing technologies.

9.1 ICT services in Cyprus

The information and communication technologies (ICT) services sector is increasingly important to the growth of advanced economies. Digitalisation of the economy and the availability of ICT services play a central role for competitiveness, with investments in ICT capital as a key driver of productivity growth. However, the contribution of ICT services to Cyprus' economic performance appears to have been limited. Although ICT investment and adoption is low, Cyprus can point to some success as a (regional) headquarters location for ICT companies. There are also ongoing efforts to promote Cyprus as a location for investments from technology companies across a range of activities, including software development, systems integration, research and development, as well as marketing and sales.

The Digital Strategy and Action Plan, adopted in 2012, identifies ICT as one of the country's priority growth sectors. The revised Action Plan for Growth also emphasises the promotion of e-Government, and the 2018 National Reform Programme has several initiatives in this direction (e.g. e-Justice, e-Health). An ICT ecosystem of sector associations, research institutes, excellence centres, incubators and other support organisations is emerging and should help boost development of the sector. In this context, Cyprus is seen to have considerable potential as a (regional) digital hub, able to exploit its educated workforce, developed infrastructure, business friendly environment, and safe and secure situation.

ICT services definition

The OECD defines ICT services as economic activities whose *"products are intended to enable and/or fulfil the function of information processing and communication".* Under the NACE Rev. 2 classification, ICT services cover:

- ICT wholesale (full title: "Wholesale of information and communication equipment") - division 46.5;
- Software publishing - division 58.2;
- Telecommunications - division 61;
- Computer programming & consultancy (full title: "Computer programming, consultancy and related activities") - division 62;
- Data processing & hosting (full title: "Data processing, hosting and related activities; web portals") - division 63.1;
- ICT repair (full title: "Repair of computers and communication equipment") -division 95.1.

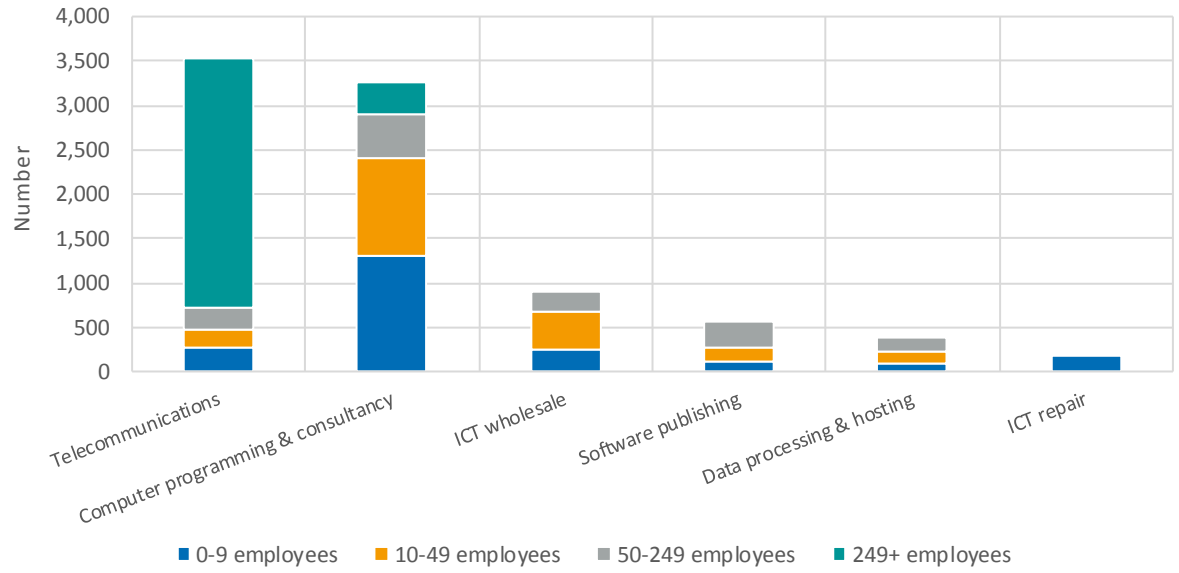
Source: Eurostat Metadata, available at: http://ec.europa.eu/eurostat/cache/metadata/de/isoc_se_esms.htm

Size, structure and performance of ICT services

There are more than 1,300 companies in the Cyprus ICT services sector. Jointly, they generate an annual turnover of more than €2.8 billion and employ around nine thousand people. Almost half of the ICT services companies in Cyprus are either engaged in computer programming or consultancy activities, with other ICT services and ICT facilities management adding to the overall number. Telecommunications is the second largest segment in terms of number of companies, and the largest in terms of employment. By comparison, relatively few companies are active in ICT wholesale, ICT repair, data processing & hosting, or software publishing. (Figure 137)

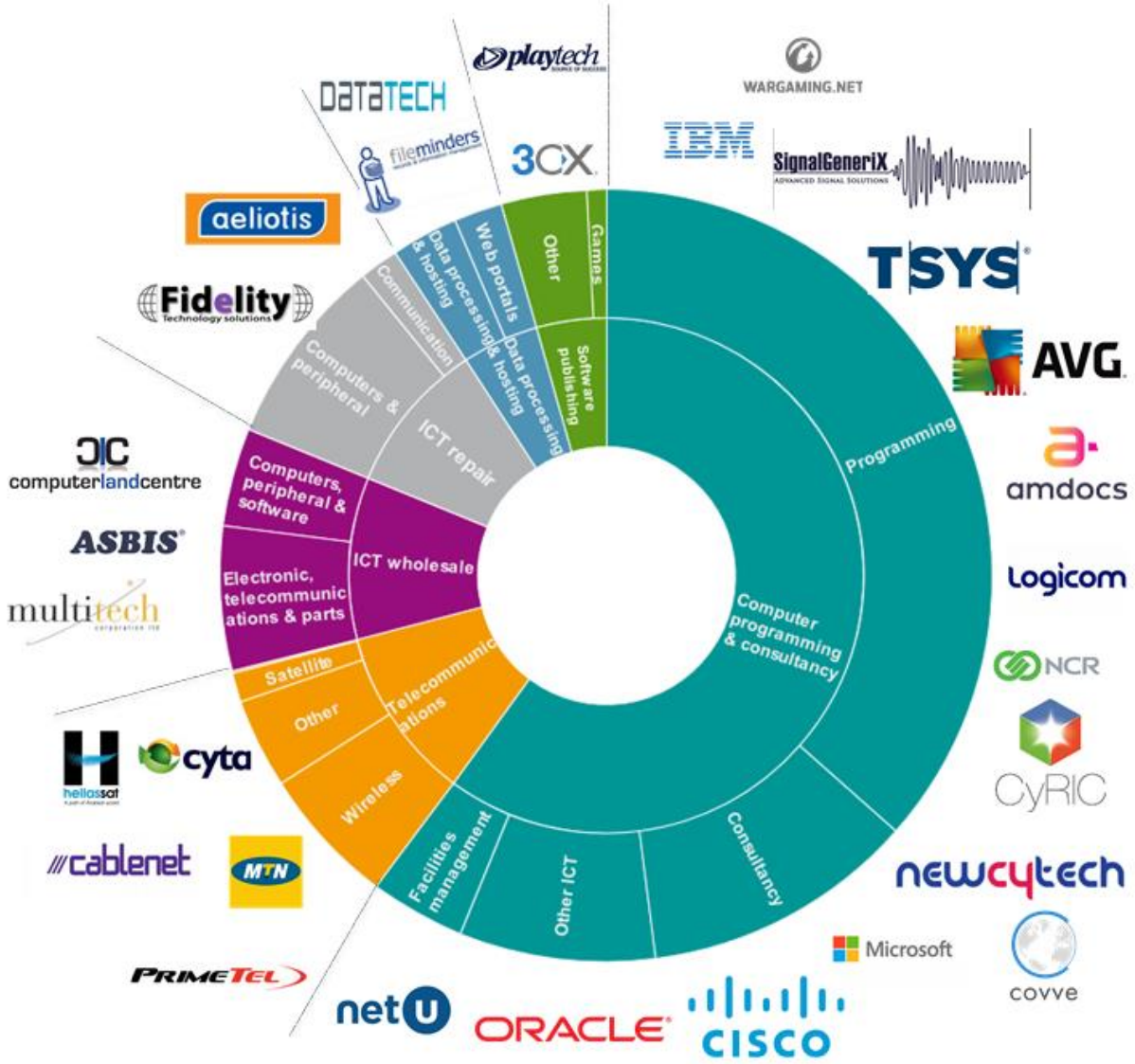
Most ICT services companies in Cyprus are SMEs, with more than 90 percent of all enterprises employing less than 10 people and 99.5 percent less than 50 people. The sector has only four large companies (with more than 249 employees), three of which belong to the telecommunications sub-sector and one to the computer & programming sub-sector. The sector has a further 12 medium-sized companies (between 50 and 249 employees). Telecommunications is the largest ICT services sub-sector by employment, employing more than 3,500 people. Within telecommunications, more than 2,000 ICT services employees work for the Cyprus Telecommunication Authority (Cyta). Computer programming & consultancy, which employs approximately 3,300 people, is the second highest contributor to employment. (Figure 136)

Figure 136 Employment in ICT services by sub-sector and firm size, 2016



Source: Cystat 2016, Employment

Figure 137 Breakdown of number of ICT services enterprises and examples of companies with presence in Cyprus by sub-sector, 2016



Note: The logos around the pie chart represent some examples of companies in each of the six main sub-sectors, the selection of companies was made based on stakeholders' inputs and does not imply that these are the largest or more significant players in their respective sectors.
Source: Cystat (number of enterprises)

The ICT sector in Cyprus has been on a strong upwards growth trajectory, particularly from 2012 onwards. Since 2008, the number of ICT companies in Cyprus more than doubled and (nominal) turnover has increased from €1.1 billion to more than €2.8 billion. The value added of the sector reached €787 million in 2016. Employment growth has been more restrained (though still healthy), increasing from 7,000 in 2008 to 9,000 in 2016.

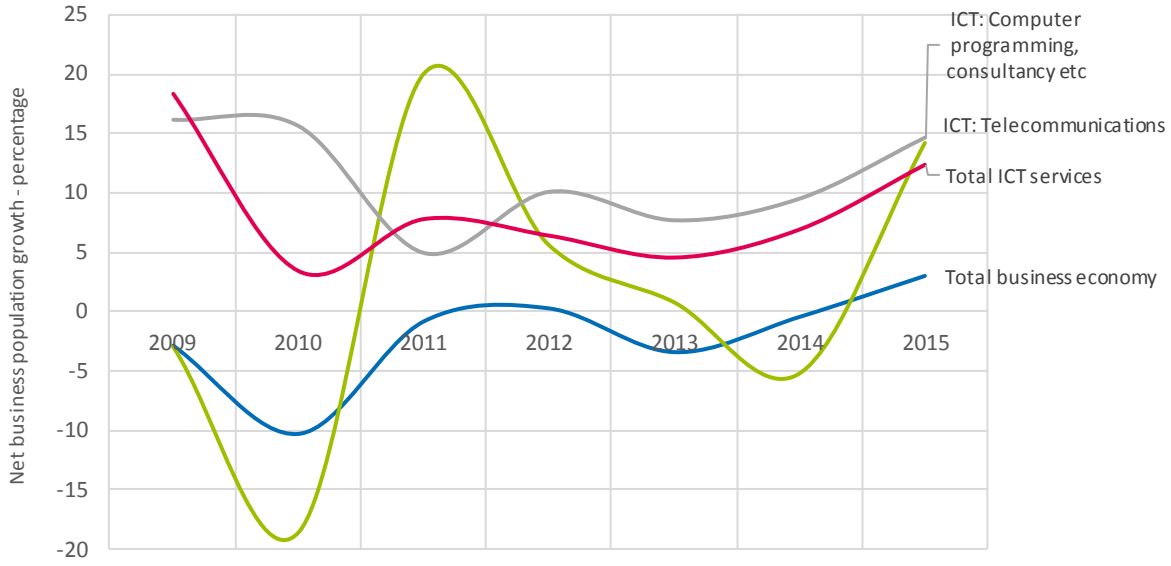
The growth of ICT services is to a large extent led by an increased activity in the computer programming & consultancy segment, whose share in total turnover of ICT services rose from 17 percent to 45 percent in the period 2013 to 2016. The telecommunications segment remains, however, the largest segment in terms of value added, accounting for almost half of the total for ICT services. (Figure 138)

Figure 138 ICT services in Cyprus – evolution of key variables

Source: Eurostat Structural Business Statistics, *Turnover, Value added, Number of employees, Number of enterprises* [sbs_na_sca_r2]

Compared to the total business economy, business demographics in the ICT services sector appear favourable. The high growth rate of the net population of firms indicates a healthy creation of new companies. (Figure 139) However, it remains to be seen if the present dynamism of the sector will be followed by a successful scaling-up of operations. Survival rates for ICT service companies are similar to other sectors, with more than half of the companies not surviving beyond year three.

Figure 139 Net business population growth (in percent)

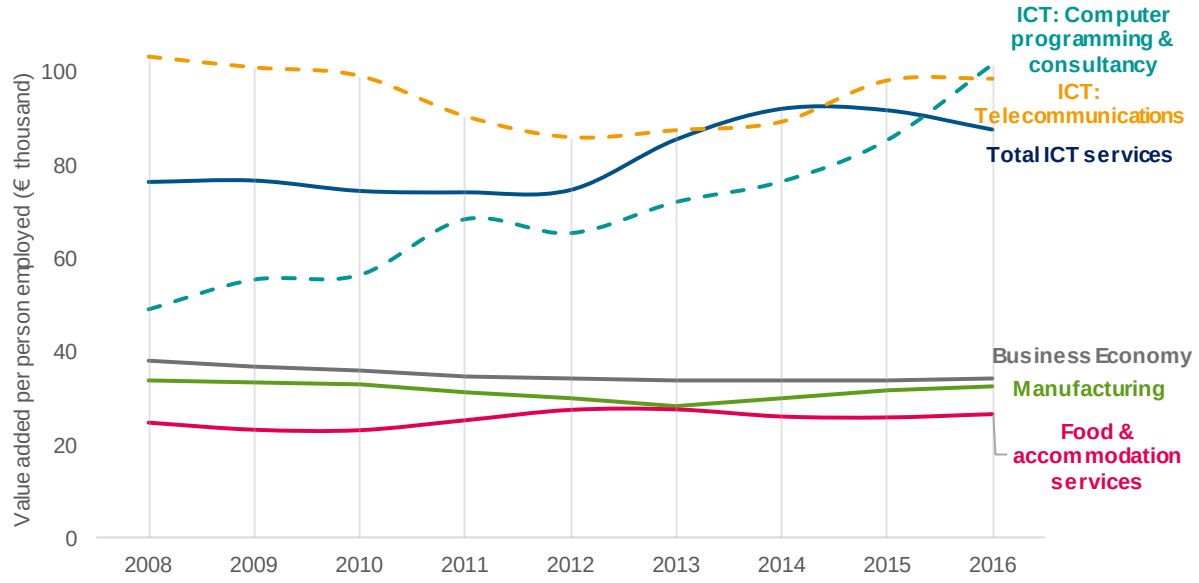


Source: Business demography by legal form (from 2004 onwards, NACE Rev. 2) [bd_9ac_l_form_r2]

Labour productivity in ICT services is significantly higher than the average for the total business economy in Cyprus. Within ICT services, labour productivity was higher in telecommunications than in computer programming until 2015, after which programming

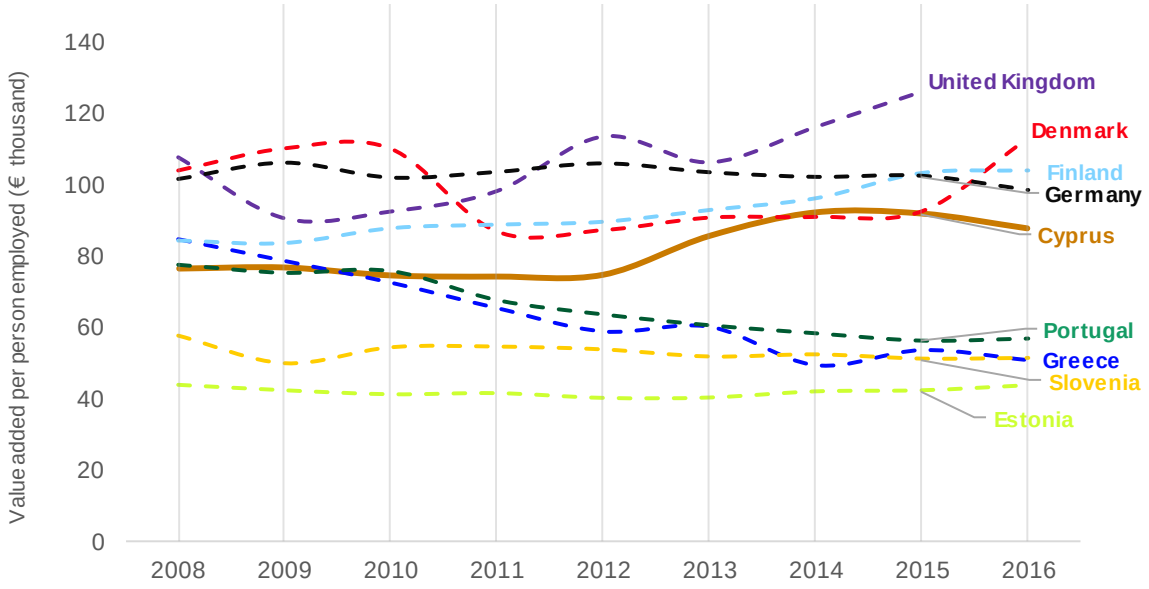
grew more rapidly, surpassing telecommunication in 2016. The high labour productivity in telecommunications reflects both the industry's greater capital intensity and the relatively large size of telecommunications companies. (Figure 140) Compared to the benchmark countries, nominal labour productivity in Cyprus is higher than in Portugal, Greece, Slovenia and Estonia. Furthermore, since 2008, Cyprus enjoyed the second highest growth rate in ICT services productivity, right after Ireland and Finland and followed by the UK and Germany. (Figure 141) Over the past few years, there has been a disproportionate increase in value added relative to employment, reflecting the high labour productivity growth rates.

Figure 140 Labour productivity in ICT Services and selected sectors, 2008-2016



Source: Eurostat Structural Business Statistics, Apparent labour productivity [sbs_na_sca_r2]

Figure 141 Labour productivity in ICT services in Cyprus and benchmark countries, 2008- 2016

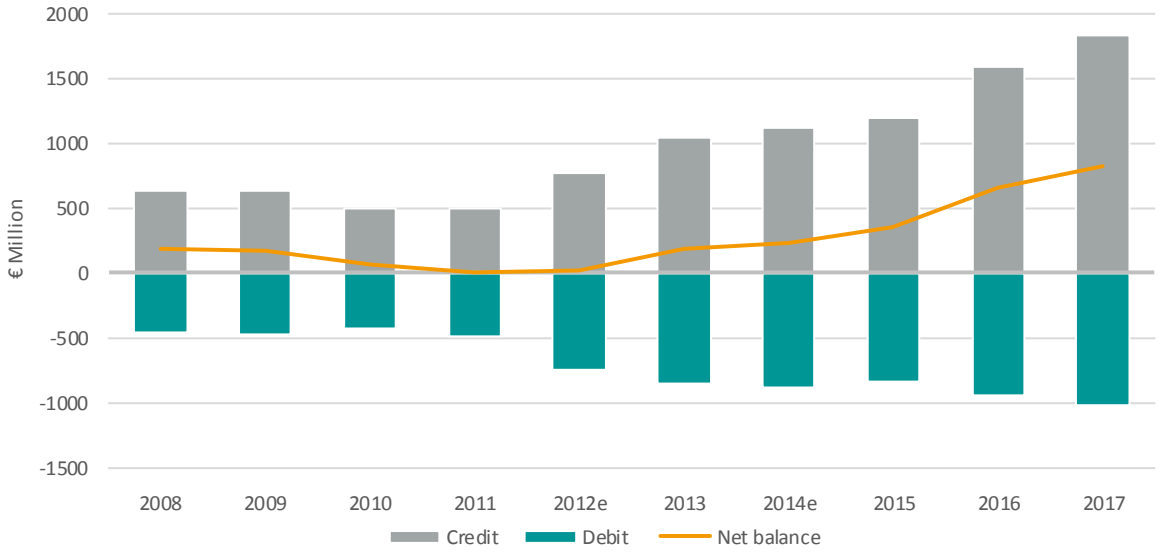


Notes: Estimated values for Greece 2009, Finland 2013, and UK 2014 (2016 data not available for the UK); Ireland not shown due to the countries very high apparent labour productivity level.
Source: Eurostat, Structural Business Statistics, Apparent labour productivity [sbs_na_sca_r2]

Trade in ICT services has increased rapidly since 2011, with imports in 2017 more than double and exports more than three times their value compared to 2008. Exports of

computer services, which grew from €565 million in 2008 to €1.8 billion in 2017, have been the major driver of this impressive export performance. Partly, this was offset by increased imports of computer services, which went from approximately €350 million in 2008 to €900 million in 2017. (Figure 142)

Figure 142 Balance of payments in ICT services



Note: Ecorys estimate based on an interpolation of Central Bank of Cyprus data
Source: Central Bank of Cyprus

The telecommunications sub-sector

The telecommunications sub-sector in Cyprus consists of 140 companies that generate a turnover above €700 million and a value added of approximately €360 million. The sector is dominated by few large companies, notably Cyta, which has an estimated market share of 60 percent and accounts for more than half of employment in the telecommunications sub-sector (see Box). Other major service providers are PrimeTel, MTN, and Cablenet.

The European Commission's Digital Economy and Society Index for 2018 finds that Cyprus performs well for fixed broadband coverage (100 percent of households), mobile broadband take-up (101 subscriptions per 100 people) and ultrafast broadband coverage (85 percent of households are covered by Fibre to the Premises or Docsis 3.0). However, despite the improvements observed since 2016, Cyprus remains one of the worst performers when it comes to 4G coverage (77 percent of households in Cyprus compared to 91 percent in the whole EU), fast and ultrafast broadband take-up (9 percent of homes subscribing to broadband speed higher than 30 Mbit per second and 0.2 percent to higher than 100 Mbit per second, compared to 33 percent and 15.4 percent in the whole EU). Cyprus ranks among the three EU countries with the highest prices for fixed broadband.[13] This can be explained, at least in parts, by Cyprus' geographic location that implies comparatively high investment costs for the supply of high-speed broadband connectivity.

Profile: Cyprus Telecommunications Authority

The Cyprus Telecommunications Authority was established in 1961 as a semi-public organisation. It has remained the dominant provider of fixed and mobile telephony as well as broadband internet. Cyta's range of services also includes digital television, cloud services and other IT services. With annual revenue of €372 million, more than 2,000 employees, and a market share estimated at more than 60 percent in 2015, Cyta is a core player within

[13] EC (2016), Fixed broadband prices in Europe, available at: ec.europa.eu/newsroom/document.cfm?doc_id=47094

the ICT services sector and one of the largest companies in Cyprus.

Cyta's has a crucial role in developing critical infrastructure and promoting key pioneer innovative initiatives. The organisation's undersea fibre optic cables network links Cyprus with Greece and Egypt, providing high speed connection to the island and offering the potential to become a connecting hub between South East Europe and the Middle East. In July 2018, Cyta launched the development of its fibre to home network, aiming to connect up to 200,000 premises at internet speeds of up to 1Gbps in the coming 10 years.

Cyta's attempt to expand its services in the Greek market, which began in 2008, came to an end in 2018 with the purchase of Cyta Hellas by Vodafone. Privatisation of Cyta was set by the EU and the International Monetary Fund (IMF) as a condition for the bailout programme after the banking and fiscal crisis of 2012-13. The privatisation has still not occurred and the uncertainty for the organisation's future state poses a challenge to planning and strategic decision-making.

Sources: Interviews, Cyta (2016)

The computer programming & consultancy sub-sector

The computer programming and consultancy sub-sector in Cyprus comprises more than 800 companies, generating a turnover of €1.3 billion and employing some 3,200 people. It has boomed during recent years, with the turnover increasing fourfold between 2013 and 2016.

Computer programming & consultancy companies in Cyprus are mostly small companies (with less than 50 employees). Some of these are focussed on the provision of tailored IT solutions for public and private clients (e.g. e-Banking software, e-Government services), and include indigenous service providers, like Logicom, NetU and Cytech, as well as subsidiaries of large multinationals such as IBM and NCR. Other companies are orientated towards research and development, with business models often aiming at disruptive innovation. Such companies include SignalGenerix, specialised in state-of-the-art digital signal processing, and large multinational companies with R&D departments or teams in Cyprus, such as Amdocs and AVG. These companies develop innovative solutions that may be employed to improve business processes, products or services across a wide range of sectors, from medical services to agricultural sectors. Companies developing proprietary products for consumer and business markets—at national, European and global level—include Wargaming and 3CX, which both are foreign owned companies headquartered in Cyprus.

Profile: Wargaming

Wargaming is an online game developer and publisher headquartered in Nicosia. Established in 1998, Wargaming counts more than 200 million players (end users) for its different tittles and globally employs around 4,500 people in 15 offices. The core management and leadership team of the company is in Cyprus, while game development and design predominantly take place in Belarus and other countries.

The geographic location of Cyprus allows Wargaming to serve their operations in Europe, Asia, countries of the former Soviet Union and North America. Wargaming's strategic relocation to Cyprus took into consideration advantages offered by the island, such as political stability, EU membership, a favourable tax regime, a modern legal framework and a highly developed professional corporate services sector. Other attractions included the existing infrastructure and communications networks, the available workforce for traditional business administration roles, and the incentives provided by Cyprus to attract foreign investment.

Beyond simple client-vendor relationships, Wargaming is taking the initiative to create synergies and linkages with the Cypriot ICT ecosystem. For example, Wargaming is supporting a research project on technology, solutions and virtual reality with RISE (Research Centre on Interactive Media, Smart Systems and Emerging Technologies). Also, their internship program engages computer science students from Cyprus' universities.

Sources: Interviews, Wargaming website: https://wargaming.com

The overall business environment in Cyprus, its beneficial tax regime and other incentives have encouraged several foreign ICT companies to establish offices in Cyprus. The same characteristics have also supported Cypriot SMEs to flourish and expand their services internationally. Thus, maintaining the country's strong performance in these areas and offering additional incentives and support to ICT companies are viewed as important elements for attracting more international players, while also benefitting already established ICT companies. Additional incentives could include, for example, specific tax benefits addressed to the ICT (services) sector or other measures such as privileged access to public services, assistance with human resources activities (e.g. support in finding housing of employees, visa facilitation), organisation of events and training (e.g. on topics such as EU market standards and EU financing structures) and access to developed support structures of the ICT ecosystem.

Although important internationally orientated computer programming & consultancy companies are present in Cyprus, the extent of their integration in the Cypriot ICT ecosystem can be questioned. In some cases, there are seemingly few or no synergies and linkages between companies and other actors in the Cypriot eco-system, such as universities. Promoting greater collaboration within the sector would create possibilities to share know-how and could support indigenous companies to reach out to global markets.

The ICT services ecosystem

The strength of the surrounding ecosystem for ICT services is viewed as an important asset for the collective development of ICT companies in Cyprus. As illustrated in Figure 143, the ICT ecosystem in Cyprus goes beyond those companies directly active in the sector, also including other organisations that support ICT services companies in several ways.

- **Universities**

Cyprus' eight universities offer 18 bachelor programmes and 25 post-graduate programmes in ICT disciplines, such as computer science, computer engineering, management information systems, informatics, web design, as well as more specialised disciplines such as cybersecurity (European University of Cyprus) and digital currencies (see Box). As such, they have an important role to play in the ICT ecosystem as a source of a competent and skilled workforce. However, despite the fast growth of ICT services in Cyprus and a corresponding increase in the demand for ICT graduates, the number of students graduating with ICT disciplines has decreased in recent years. According to Eurostat data, there were less than 200 tertiary level graduates in ICT studies in 2016 and, in general, the supply of ICT graduate is regarded as insufficient to satisfy the demand in the job market. Stakeholders point to various factors contributing to low numbers of ICT students, including preferences to study in foreign universities, 'brain drain' and a lack of 'prestige' of ICT studies and more general, studies in science, technology, engineering and mathematics (STEM). (Figure 144)

Cypriot universities have been successful in obtaining EU research funding and have a track-record in cooperating with important research institutes and companies from all over Europe. However, linkages between ICT companies and academia in Cyprus are considered weak, with untapped opportunities for collaboration. There are very limited examples of successful spin-offs from Cypriot universities.

One bottleneck has been the legal framework in Cyprus, which restricted engagement in commercial activities by public university staff and the creation of spin-off companies. This framework was revised in July 2018, allowing greater freedom for the academic community to engage in commercial activities, which should improve conditions for collaboration between companies—not only in ICT—and universities. The digital innovation hubs (described below) as well as organisations like Cyprus Seeds, which aims to support the commercialisation of academic research, can play a major role in bridging the gap between

ideas developed in the universities or research centres and the market.

Blockchain developments in Cyprus

Several blockchain initiatives are already taking place in Cyprus, paving the way for deployment of the technology on the island. In 2018, the Government of Cyprus established an ad-hoc working group to investigate the potential development of blockchain technology in Cyprus. In addition, Invest Cyprus has signed a memorandum of cooperation with the VeChain Foundation and CREAM, with the objective to develop a framework for the development of blockchain initiatives in Cyprus. This framework will focus on advising policy reforms and developing the necessary legal framework.

Another blockchain initiative was launched by the University of Nicosia in 2014. It initially started with the name "Digital currency team" and focussed on financial applications but later expanded its scope to any type of application of blockchain. This pioneering initiative offers the world's first MSc level degree focusing only on blockchain and digital currencies. It has 500 full-time students, and also offers stand-alone courses as online modules to approximately 20,000 participants.

The blockchain initiative also conducts research on potential applications of blockchain in Cyprus (e.g. in the shipping industry) as well as on a regulatory framework, suitable for the technology. In addition, the initiative organises conferences and events to raise awareness and create a dialogue on various aspects of the technology. Arriving at an early stage of the technology's development, the initiative is seen as an opportunity for the future development of more activities in related areas.

Sources: Interviews, the blockchain initiative website (https://digitalcurrency.unic.ac.cy/),

Invest Cyprus (https://www.investcyprus.org.cy/blog/invest-cyprus-welcomes-blockchain-technology)

Best practice: Slovenia's development as European blockchain hub

The Slovenian government has been successfully promoting the development of a blockchain friendly environment for the past few years. Some key initiatives are the following:

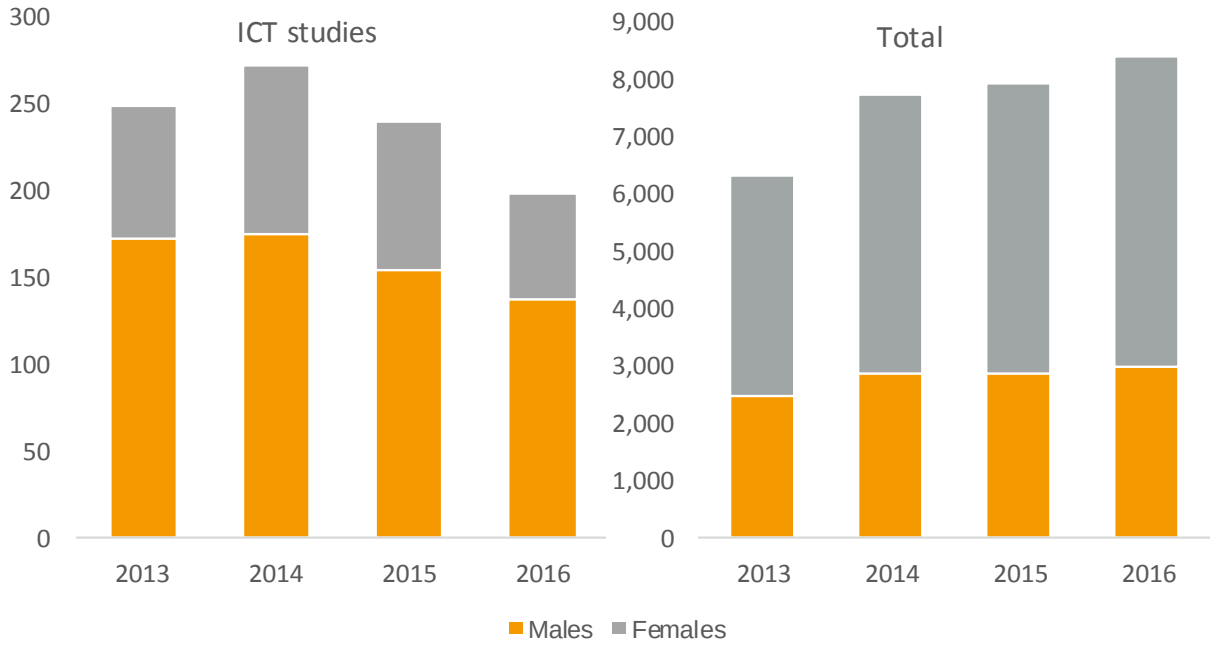
- Launch of the Blockchain Think Tank as part of the Slovenian Digital Coalition;
- Establishment of the Blockchain Slovenia initiative to identify possible legislative gaps and barriers to the deployment of blockchain technology and evaluate the potential adoption of applications in the public administration.

Sources: Digital Slovenia (http://digitalna.si/blockchain-think-tank-up-and-running-in-slovenia-03-10-2017.html)

Figure 143 Overview of organisations in the ICT services ecosystem

Note: The logos under the specific types of stakeholders represent (non-exhaustive) examples of relevant entities.

Figure 144 Tertiary education graduates by sex, ICT studies and total number



Source: Eurostat, Graduates by education level, programme orientation, sex and field of education [educ_uoe_grad02]

- Digital innovation hubs

Digital innovation hubs in Cyprus include the *KIOS Research and Innovation Centre of Excellence* (KIOS CoE) at the University of Cyprus (see Box), the *Research Centre on Interactive Media Smart Systems and Emerging Technologies* (RISE), as well as the *Microsoft Innovation Centre* at the University of Nicosia. Digital innovation hubs have been identified by the European Commission as critical for encouraging players within and beyond the ICT ecosystem to grasp the full potential of digitalisation. These hubs play an important role by enhancing cooperation and creating synergies and linkages in the ICT sector, within the country and abroad. Their existence often relies on external funding (public or private). According to stakeholders they face difficulties in developing and implementing a business model that would ensure their autonomy and sustainability. Secure sources of funding are identified as crucial for the continuation and development of the existing hubs that have links to the ICT services sector in Cyprus.

Profile: KIOS

Established in 2008 at the University of Cyprus, in 2017 the KIOS Research Centre was selected under the EU's Horizon 2020 Spreading Excellence and Widening Participation programme to transform itself into a Research and Innovation Centre of Excellence (KIOS CoE). KIOS has succeeded in securing €40 million funds for the next 15 years by combining EU, national and other complementary funds. In this endeavour, KIOS has partnered with the Imperial College, London.

KIOS currently employs some 90 people and aims to gradually grow to approximately 250 employees. Beyond conducting high quality multidisciplinary research, KIOS plans to improve the monitoring, control, management and security of critical infrastructure systems (i.e. large-scale complex systems, such as telecommunication networks, and power and energy systems). Furthermore, KIOS conducts activities aimed at enhancing the overall ICT ecosystem, including:

- Organisation of events and innovation forums, providing opportunities for networking;
- Training programmes to improve digital skills of high-tech and technology sectors;
- Consulting activities (e.g. support with technical roadmaps);

- Support with intellectual property rights (early access to licensing and patents)

Sources: Stakeholder interviews, KIOS website (http://www.kios.ucy.ac.cy)

- Incubators and accelerators

Examples of incubators and accelerators in Cyprus include: The Gravity incubator, which provides premises as well as hands-on support and mentoring to start-ups, including ICT start-ups; Chrysalis LEAP, which promotes innovation and entrepreneurship in clean tech; and the IDEA accelerator, which is an initiative by the Bank of Cyprus and the Cyprus International Institute of Management, and that offers a full package of services including funding. In addition to support to companies, including the preparation for an entry into international markets, stakeholders indicate that business incubators could play an important role in the promotion of entrepreneurship. This is seen as key for the creation of indigenous innovative companies that could drive future development of ICT services in Cyprus.

Specifically concerning spin-offs from universities or start-ups inspired by university research, as mentioned above, rules preventing university research for the development of marketable products and services used to be a constraint. Several sectoral stakeholders stressed the importance of not only implementing the new legislation as quickly as possible but, also promoting entrepreneurship within universities.

- Associations

Two sector associations are focussed on ICT services: the Cyprus Computer Society (CCS) and the Cyprus Information Technology Enterprises Association (CITEA). Their role includes taking actions for addressing the sectors' issues and challenges (e.g. promoting IT certifications to overcome the skills shortage), as well as the representation and advocacy to policy makers (e.g. requesting improvements in tendering procedures). In addition to the ICT sector associations, the Cyprus Chamber of Commerce and Industry, Startup Cyprus, and other associations play an important role. For instance, they can affect the sector's performance by working towards the improvement of the business environment in Cyprus and by promoting potential synergies within and across sectors (e.g. through the promotion of digital initiatives in other sectors that may create demand and synergies with ICT services).

- Media and events

Media and events focusing on the ICT sector are another element of the ecosystem. Their role and value is in bringing together stakeholders and facilitating the flow of information (e.g. companies, users and policy makers). Media companies such as RiseTech Media support the digital presence of start-ups, while events offer important networking opportunities, such as, for example, the Cyprus Information and Communication Technology Conference & Exhibition

- Public and private funds

Cyprus benefits from several EU level initiatives, such as Horizon 2020 funding for research activities. Nationally, in 2016 the Cypriot government approved tax incentives (up to 50 percent) for investments in innovative start-ups. However, even though such incentives are appreciated by stakeholders, the financial infrastructure for innovation and business development has several shortcomings. These include difficulties of obtaining bank loans, limited financing through the local equity market, and limited availability of venture capital. For this reason, stakeholders point to the need for developing a dedicated financial support mechanism to support ICT companies, in particular start-ups and innovative companies.

Best practice: Netherlands Enterprise Agency support for innovative ICT services

The Netherlands Enterprise Agency (RVO) is a government agency that, among other activities, supports business initiatives and provides grant schemes. RVO provides a wide variety of services and covers different business sectors. The agency runs a dedicated ICT venture capital fund of €3.2 million, which targets innovative start-ups developing software for internet and application services, enterprise applications or disclosure solutions for existing systems. The fund is managed by people with practical experience in the software sector.

Apart from the ICT venture capital fund, the TechNano fund focuses on specific clusters with great market potential. Besides nano-and high-tech, these are cyber security, business software, data analytics and managed IT services. In addition, the agency provides several types of funding opportunities suitable for innovative businesses (seed funding, equity funding) and they also target different phases of development (e.g. proof-of-concept funding).

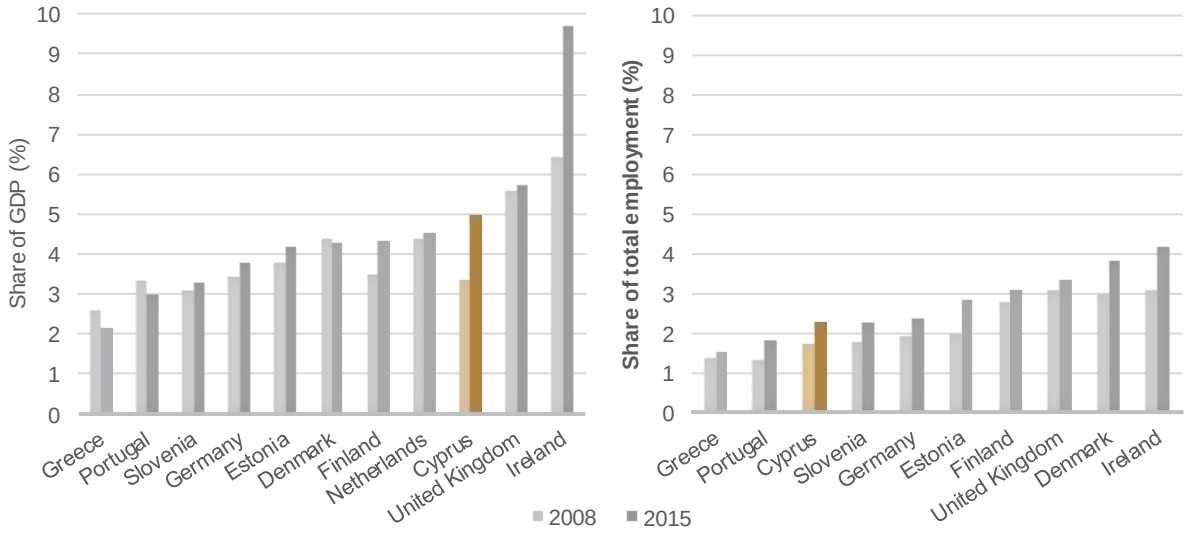
Source: https://www.rvo.nl

ICT sector employment and digital skills shortage

ICT services generated 5 percent of Cypriot GDP in 2015 which, compared to the benchmark countries, is the third highest share after Ireland (9.7 percent) and the UK (5.7 percent). Driven by strong growth between 2012 and 2014, the sector's share in GDP has increased by 1.7 percentage points compared to 2008. Only Ireland experienced a stronger growth, with the share increasing by 3.3 percentage points. (Figure 145)

Employment is still lagging behind the benchmark countries, with the ICT sector accounting for only 2.3 percent of employment in Cyprus. The disproportionately small increase in the share of employment—0.7 percent since 2008 compared to the 1.7 percent increase in value-added—implies that labour productivity in the ICT services sector has risen more rapidly than the national average for Cyprus and for ICT services in most other benchmark countries. (Figure 145)

Figure 145 Share of ICT services in the economy, 2008 and 2015

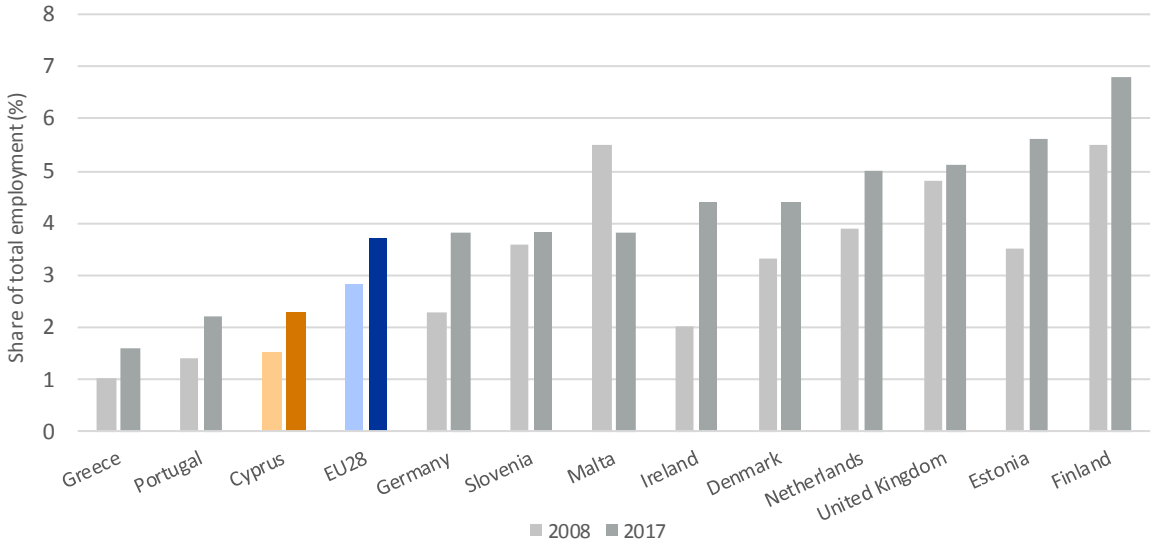


Notes: Ireland data for 2009 and 2015
Source: Eurostat, Percentage of value added at factor cost [tin00074] & Percentage of number of persons employed in the ICT sector as % of the total employment (SBS, variable V16110)

For the economy, ICT specialists - of which 8 out of 10 are male - represent 2.3 percent of total employment, which is lower than the EU average of 3.7 percent and below that of all benchmarking countries except Greece and Portugal. (Figure 146) This reflects the limited

growth of employment in the ICT services sector. However, in the period of 2008 to 2017, the growth rate of the number of ICT specialists in the economy has been higher than the EU average. Future forecasts from the Skills Panorama indicate an ICT services employment growth rate of 4.1 percent, which is higher than the EU average of 3.3 percent (CEDEFOP, 2018). If this is to be achieved, actions aimed at increasing the number of workers with ICT education and reducing the skills mismatch will be necessary to safeguard the future growth of the sector.

Figure 146 Employed ICT specialists (all sectors), 2008 and 2017



Source: Eurostat, Employed ICT specialists [isoc_sks_itspt]

The strong development and growth of the ICT services sector in Cyprus and low overall levels of digital skills explain why the ICT labour market is tight. Demand for ICT specialists appears to exceed supply, with companies reporting difficulties finding appropriately skilled employees. Although this ICT skills shortage is an issue for most if not all EU countries, it appears to be more pervasive in Cyprus. As noted earlier, the numbers of ICT graduates from Cypriot universities has recently decreased and is not enough to cover the sector's needs. At the same time, young professionals are attracted by opportunities to work abroad, while conversely ICT companies in Cyprus appear to face difficulties to attract appropriately skilled foreign professionals. The issue of skills shortage forms one of the main challenges for development of the ICT services sector in Cyprus.

In addition, the 2018 Digital Economy and Society Index (DESI) indicates that Cyprus does poorly in digital human capital, ranking 25th among all EU countries. Only 50 percent of the population have at least basic digital skills compared to an EU average of 57 percent, and only 9.8 per thousand individuals aged 20-29 are STEM graduates, as opposed to an EU average of 19 per thousand. In addition, European Commission (2018a) indicates that Cyprus has one of the highest share of people who have never used the internet (17.8 percent). However, the DESI shows that Cyprus is also one of the most improved countries in terms of ICT skills (both basic and advanced). (Figure 123 on page 120)

Best practice: Improving ICT skills

Cyprus has initiated several actions to address the issue of ICT skills shortages, for example, the decision to set-up the National Alliance of Digital Jobs as part of the European Grand Coalition. The Alliance brings together universities, companies and policy makers with the aim to improve digital skills. The Ministry of Education and Culture has also in-

tensified efforts to improve digital skills, for instance, by introducing training and free-of-charge access to the European Computer Driving License Certification for pupils in secondary education. The same training and access to this certification is offered to vulnerable economic groups (e.g. unemployed people). In addition, the Department of Educational Technology at the Ministry of Education and Culture is introducing ICT technologies in the educational system as a tool, such as through e-Learning environments, including:

- E-epimorfosi – http://www.e-epimorfosi.ac.cy
- E-Learning – http://www.elearn.pi.ac.cy

Apart from enhancing digital skills through formal education, certain initiatives in EU countries aim at improving digital skills through lifelong learning and by targeting specific groups. Some examples of best practices include:

- The "Make IT work" project in the Netherlands aims at upgrading IT skills of non-IT graduates. This initiative works through partnership agreements between the Amsterdam University of Applied Sciences and affiliated companies in the Netherlands. The initiative offers students a combination of courses and paid work experience. It has been successfully responding to urgent market demands for ICT skills. – http://www.it-omscholing.nl/nl/
- "IT FOR SHE" organised by Perspektywy, a Polish foundation that promotes women's participation in science, technology and mathematics. Their activities include an annual women's tech-camp and pairing mentors in leading technology companies with young women aiming at high-tech careers. – http://www.itforshe.pl

Sources:
https://ec.europa.eu/digital-single-market/en/news/digital-europe-needs-digital-skills-best-practices-around-eu

Demand for ICT services

The main markets for ICT services within Cyprus are the telecommunications sector, the public administration, and companies in the banking and financial sector, which are estimated to represent a combined share of 65 percent of domestic demand for ICT services. In recent years, however, demand from the banking sector has been limited as it still recovers from the fiscal and banking crisis. (Skiadopoulos, 2017)

There are an increasing number of public-sector initiatives requiring ICT services. In 2016 and 2017 six large scale ICT projects—with budgets from €0.5 million to €11 million—were launched and awarded by public entities, such as the Cyprus Port Authority, the Cyprus Health Insurance organisation and the Cyprus Police. Furthermore, the National Reform Programme 2018 foresees further advances in the implementation of Cyprus' e-Government strategy.

Despite considerable public-sector digitalisation efforts over the last few years, some stakeholders point to weaknesses, such as a lack of quick and simple procedures for ICT initiatives, and limited flexibility of public administrations that would foster large-scale ICT innovation projects. Ultimately, failure to address these challenges runs the risk of outdated and low-innovation solutions.

Conversely, Cyprus' small size and easily accessible market offer conditions that could support controlled product or pilot testing of digitalisation solutions for public services in areas such as e-Health. Successful delivery of solutions could subsequently feed new exports, with Cyprus providing tested solutions to other countries. Exploitation of such opportunities is, however, confronted by structural limitations due to the small size and limited capacity of many ICT service enterprises in Cyprus. To address this challenge, stakeholders point to the need to develop a more cooperative business culture and a more robust ICT ecosystem in Cyprus. In principle, consortia of smaller companies or cooperation structures with larger multinational companies could unlock the potential of Cypriot companies to successfully deliver large e-Government projects. These projects could also improve the 'know how' for improving the delivery and provision of ICT services to the private sector.
Apart from the demand created by the public sector and a few selected sectors such as

banking, finance and professional services, the firm structure in the rest of the economy—characterised by a prevalence of SMEs and very few large companies—is viewed as a constraining the development of the ICT services sector. Private sector technology adoption and innovation activity in Cyprus is low, implying low demand for ICT services and limited domestic market demand stimulation for the development and expansion of ICT services provision. Stakeholders indicate that low levels of digital skills within the economy, limited incentives for enterprise digitalisation, and a lack of entrepreneurial culture (and in turn a lack of ambitious, outward-looking and technologically sophisticated companies) are all contributing factors.

9.2 ICT sector policies and other initiatives

Cyprus authorities have identified ICT as a critical factor for improving competitiveness and raising economic growth. The *Digital Strategy for Cyprus*, introduced in 2012 and currently under review, sets out a comprehensive agenda for the period of 2012 to 2020, aiming to promote the use of ICT in all sectors of the economy. The strategy contains the following components:

- Connect Cyprus entails the improvement of broadband coverage at an affordable cost, as well as enhancing competition in electronic communications and securing key infrastructures.
- Modernising public administration and providing public electronic services, with the aim of improving the effectiveness and efficiency of the public sector through the use of innovative ICT solutions, both internally and by providing digital services to citizens.
- Raising digital literacy throughout society (including vulnerable groups) and promoting a wide penetration of broadband internet, thereby ensuring inclusion of all.
- Education and learning, which envisages the digitalisation of education in Cyprus.
- Digital entrepreneurship, with the objective of supporting ICT use in businesses (including SMEs) and funding R&D in the ICT sector.

The strategy foresees 21 specific measures and detailed actions, several of which have been implemented or have been launched. Specific actions that are already ongoing include the implementation of free training programmes to improve digital literacy and the ability of citizens to use public e-Services. Similarly, a voucher scheme to subsidize ultra-fast broadband connections is being implemented to increase demand while encouraging infrastructure investment.

Responsibility for the implementation of the strategy is shared between the Ministry of Finance (Department of Information Technology Services) and the Ministry of Transport, Communications and Works (Department of Electronic Communications). The former oversees the e-Government part of the digital strategy, while the latter covers overall coordination and implementation. The e-Government Board with ministerial representation was established in 2015 and combines these ministries, together with the Digital Champion and the Ministry of Energy, Commerce and Industry. The board has the responsibility to approve, prioritise and monitor e-Government projects. However, some stakeholders indicate that this structure has not brought the hoped for extensive progress in e-Government services and suggest that a simpler governance model with a clear and simple assignment of implementation responsibilities could help bolster effectiveness. Some stakeholders stress the importance of handing the responsibility to a single central entity (person or department) with appropriate decision-making competencies. This entity could take the form of a deputy ministry or a temporary structure set up for the implementation of the strategy. If such an entity is established, it should work in close collaboration with the other relevant authorities (e.g. through the e-Government Board).

Regarding existing digital services, the secure gateway *Ariadni* has provided an essen-

tial first step for the provision of e-Government services. Currently, 100 public e-Services are available, doubling the number of services provided since 2017. In addition, 2018 marked the entry into force of the obligation to submit annual tax declarations through the online platform *Taxisnet*. However, while e-Government services development objectives are seen to correspond to citizens' needs, its implementation is not considered to be optimal. Recent actions have been taken to facilitate cooperation and transfer of knowledge and documents between departments and authorities. For example, the national e-Government interoperability framework (eGIF) was updated in 2017. The 2018 National Reform Programme includes other forthcoming e-Government initiatives in the areas of e-Justice (under preparation, with an expected pilot operation in 2019), e-Identity (tender announcement in 2018), and e-Health (in the tendering phase, with an expected launch in 2021).

In 2016, Cyprus signed a Memorandum of Understanding with Estonia, with the objective of gaining know-how based on Estonia's pioneering e-Government solutions (see Box). Estonia's approach could inspire similar horizontal measures in Cyprus, to ensure efficiency of the e-Government framework and providing a solution for access issues.

Best practice: Estonia e-Government services

Estonia is the European champion in e-Government services with the highest share of users in the EU (96 percent). Studies indicate that Estonia's e-Solutions platform called "e-Estonia", has led to a tremendous increase in productivity and improvements of the business environment. Estonia ranks third in the EU for start-ups per capita, with 31 start-ups per 100,000 inhabitants. Several internationally successful companies were born in this ecosystem, including Skype, Pipedrive and Teleport. The main building blocks of this successful structure are:

- E-Identity, includes digital signatures and e-Voting, as well as e-Residency for which 35,000 people have applied, many of whom took advantage of the e-Residence to set-up their business in Estonia.
- Interoperability systems, referring to the "x-road" tool which allows secure and confidential exchange of data through all the e-Estonia systems and platforms. X-road has been "exported" and is also implemented in Finland, Azerbaijan, Namibia and the Faroe Islands.
- Security and safety block, which aims to address complex cyber threats by designing a keyless signature infrastructure (KSI) based on blockchain technology to ensure the integrity and security of data while maintaining data privacy.
- E-Health, includes an e-Patient portal that provides the possibility to create and maintain a common record with data from different healthcare professionals and organisations, accessible online for the users, and authorised medical professionals.
- Mobility services, includes activities such as the legalisation of autonomous vehicles on public roads, and the plan to reorganise the public transportation system and incorporate autonomous vehicles.
- Business and finance, including initiatives easing administrative burdens and facilitating public services through digital solutions such as e-Tax, e-Banking and an e-Business register.
- Education, including the e-School platform with more than 200,000 active users, which offers services such as online grades, homework and evaluations.

E-Estonia is particularly beneficial for the country's ICT services sector, having created demand for the development of state-of-art digital services and is one of the main drivers of Estonia's good performance in the ICT services sector.

Source: e-Estonia – http://www.e-estonia.com

A broader issue concerning implementation of the digital strategy are ongoing delays, often associated with public procurement procedures. Incorporating innovative elements in public procurement is regarded as a possible way to achieve better implementation of digitalisation initiatives.

Best practice example: Public procurement of innovative solutions

The purchasing power of the public sector can also be used to become an early adopter of innovative solutions. Public procurement of innovative solutions supports the modernisation of the public sector and in parallel creates demand and promotes the commercialisation of innovative products and services. In Cyprus, there is no specific regime for public procurement of innovative solutions. The transposition of the EU public procurement directives, which was implemented by the adoption of law 73(I)/2016, has brought an innovation angle to traditional procurement and improved the position of SMEs (e.g. by requiring the division of procurement contracts into lots). However, examples from other countries indicate more advanced steps in this direction could bring additional benefits:

- The Small Business Research Initiative in the UK supported the development of a long-endurance, unmanned marine vessel for oceanographic research by an SME in 2014. Almost £500,000 were awarded in two phases (concept development and prototyping).
- In Germany, a competence centre for public procurement was created to increase public procurement of innovative solutions. The centre provides advice to the German public sector.
- Some EU countries set specific targets for innovation-targeted procurement. For instance, in Finland, a five percent target for innovative public procurement (out of the total procurement value) was set in 2015. The same target was 2.5 percent in the Netherlands. Non-quantified targets promoting innovation and participation of SMEs in procurement were also set by various countries (e.g. France and Belgium).
- Some EU Member States use pre-commercial procurement, with a focus on R&D. It refers to buying R&D at high technological readiness levels from competing suppliers at different project phases (concept design, prototyping, development, testing etc.) to compare the options and reduce the suppliers in the next phase(s).

Source: OECD (2017)

9.3 SWOT analysis and recommendations

Table 2 on page 149 presents a SWOT analysis, summarising key elements arising from the description and assessment of the ICT service sector presented in this chapter, and that are relevant for the assessment of the sector's competitiveness position and performance.[14]

Several actions could be taken to stimulate growth in ICT services and address current bottlenecks. Furthermore, any actions improving the business environment and competitiveness conditions in Cyprus would affect the ICT services sector as well. However, there are several sector-specific issues of importance for ICT services. Among the issues to be taken into consideration when designing future strategies and actions for ICT services sector, the following appear to be of particular importance:

- **Ensuring clear coordination and assignment of responsibilities for the implementation of the Digital Strategy:** Assigning clear responsibilities for the implementation and coordination of actions should lead to a sense of ownership and increase the effectiveness and efficiency of the actual implementation.
- **Creating a sense of urgency for the implementation of the Digital Strategy:** Navigating lengthy processes and bureaucratic procedures can be particularly challenging. Creating a sense of urgency for implementation should be achieved through short-term mandates with specific, clearly defined objectives and key performance indicators for project managers and coordinators.
- **Enhancing digital skills and addressing skills-mismatch:** Including promotion of ICT university programmes in schools, promotion of vocational educa-

[14] The strengths and weaknesses of Cyprus as a whole and specific segments such as the technology, innovation, and knowledge category, presented in Section 7, also affect the ICT services sector. However, this section focuses on those elements that are particularly important for or specific to ICT services.

tion and training for adults, and promotion of ICT education and life-long learning targeted to women. More broadly, promoting the attractiveness of ICT services as a career path.

- **Attracting foreign ICT companies to Cyprus:** Including re-location incentives (e.g. with housing, support services, etc.) and visa facilitation for non-EU citizens, alongside maintaining an advantageous tax regime (with potential additional advantages for R&D) and continuously improving the business environment. These are all measures that are important for attracting foreign companies in Cyprus. Furthermore, innovative structures such as Estonia's e-Residence scheme could also lead to an increased presence of international ICT services companies in Cyprus.
- **Providing digitalisation incentives for key sectors of the economy:** Incentives in the form of financial or other support should be provided to companies in key sectors (e.g. tourism, shipping) for participating in the digital economy (e.g. e-Commerce, smart initiatives, etc.) or digitalising management and administrative processes. Incentives could also be provided to digital start-ups.
- **Providing a clear regulatory framework for new, game-changing technologies:** Adoption of clear rules and conditions for the use of new technologies (e.g. artificial intelligence, blockchain, big data, cloud computing, automated driving, virtual and augmented reality) should set the right conditions for the development of business activity in those areas.

Table 2: ICT services SWOT analysis

Strengths	Weaknesses
• Strong growth of the ICT services sector. • Presence of multinational ICT services companies' R&D departments or (regional) headquarters in Cyprus. • Newly established innovation hubs, focusing on innovative R&D and support to innovative start-ups. • Government awareness and policy recognition of the importance of ICT services for growth and development of the economy. Prioritisation of policy measures reflecting ICT sector needs. • Availability of key telecommunications infrastructures.	• Low domestic demand for ICT services. Limited ambition of digitalisation strategies within the private sector. • Shortage of ICT specialists with appropriate skills. • Lack of availability/access to financial instruments for innovative and high growth potential enterprises. • Lack of specific incentives for ICT companies. • Slow implementation of the digital agenda by the public sector. • Coordination issues and burdensome bureaucracy for the implementation of digital initiatives (including long and heavy tendering procedures). • High broadband cost to speed ratio.
Opportunities	**Threats**
• Increasing importance and size of ICT globally. • Positive forecasts for the growth of ICT services in Cyprus. • Leverage EU funds and initiatives for digitalisation of industry (e.g. support to digital innovation hubs, key enabling technologies and innovative R&D). • Potential for further attraction of activities of multinational ICT companies. (e.g. regional headquarters)	• Competition from other economies in the Middle East region (e.g. attracting regional headquarters). • Continual brain-drain, due to the existence of more attractive opportunities in ICT services abroad. • Increase of cybersecurity threats globally.

10 Key competitiveness issues and policy responses

This chapter provides a summary of Cyprus' competitiveness performance and identifies Cyprus' competitiveness strengths and weaknesses. It highlights a number of key horizontal areas where there are competitiveness issues, and points to potential areas for policy development. It also considers issues for the development of a broader forward-looking policy framework, to identify and exploit emerging opportunities for future growth.

10.1 Cyprus' competitiveness performance

The strength of Cyprus' recent economic recovery has been impressive. Real economic growth in Cyprus over the past three years (2015 to 2017) has outstripped all the benchmark countries except Ireland and Malta. This strong performance can be attributed to the correction of macroeconomic imbalances following the fiscal and banking crisis, the major policy overhaul that took place as part of the economic adjustment program and the Action Plan for Growth, and the resilience and adaptability of the economy. The reforms for fiscal consolidation and financial stability have been complemented by efforts to create a more balanced, sustainable and resilient growth model. These positive developments have led to multiple upgrades of the sovereign credit rating, allowing Cyprus to again access international capital markets.

Underneath its headline growth performance, Cyprus is generally positioned below the EU average for competitiveness outcome indicators, but is typically on a similar level or even above Eastern and Southern EU benchmark countries (i.e. Estonia, Slovenia, Portugal, Malta, and Greece):

- **Productivity** (Section 5.1). Labour productivity in Cyprus' is only slightly below the EU average. But, over the past decade, ICT-related capital and other productive investments have made only a very small contribution to GDP growth. Cyprus has only recently stabilised the negative trend in measured total factor productivity growth. This suggests greater investment is required in areas likely to boost productivity over the longer term. Tight financial lending conditions continue, however, to be a challenge for business investments.
- **Trade and Foreign Direct Investment** (Section 5.2). Cyprus' trade and FDI situation is influenced by the activities of Special Purpose Entities, implying that headline measures do not present a clear and easily comparable picture of the country's underlying performance in these areas.[15] Reflecting the small size of its primary and manufacturing sectors, Cyprus' exports of goods are limited and concentrated in only a few product areas. This is offset by a strong export performance in services, notably for travel (tourism), financial services, transport and communications. While FDI is significant, foreign investments in productive projects and activities are modest, with Cyprus having among the lowest shares of employment and value-added in foreign-controlled enterprises of the benchmark countries.
- **Employment and Jobs** (Section 5.3). The employment situation has improved in recent years and is continuing an upward trend, although it has not yet fully recovered from the losses that followed the global financial crisis and the subsequent domestic fiscal and banking crisis. Issues remain for employing younger people and, although falling, the youth unemployment rate remains above the EU average. Further, compared to the benchmark countries, it appears that labour markets in Cyprus are characterised by high levels of both vertical and horizontal skills mismatches among younger workers in certain sectors.

[15] Cyprus' attractiveness for Special Purpose Entities is not limited to a conducive legal framework but also reflects its strengths in maritime shipping services and specialised professional services that support the activities of these entities..

- **Costs and Prices** (Section 5.4). In general, business-related costs are low. Labour costs in Cyprus are below the EU average. Cyprus also has amongst the lowest rental costs for private and retail accommodation. Conversely, non-residential electricity costs and costs for high speed broadband internet access in Cyprus are among the highest of the benchmark countries. These higher costs seem to reflect structural factors, such as the reliance on imported fuel supplies and small market size.

Taken together, Cyprus' competitiveness outcomes present a mixed picture, summarised in the table below.

Table 3 Overview of competitiveness strengths and weaknesses of Cyprus

Strengths	Weaknesses
Market conditions & institutions: ***Open, competitive, and well-functioning markets***	
• Trade openness above the EU average and most benchmark countries after allowing for geographical location and country size. (Figure 59, Figure 60) • High levels of product-market efficiency (Figure 33) and low levels of market dominance. (Figure 63) • Functioning of consumer markets that is considered close to the EU average. (Figure 66) • A good balance between labour rights and labour market flexibility. (Figure 65)	• Relatively high costs of trading across borders and a high burden of customs procedures for international trade. (Figure 61and Figure 62)
Business environment & institutions: ***A well-functioning business environment but with exceptions in some areas***	

• Strong judicial independence, rule of law and political stability. (see Section 6.2)
• Performance in resolving insolvency, paying taxes and protecting investor rights are at levels equivalent to or above the EU average. (Figure 68)
• Low corporate tax rates. (Figure 74)
	• Weaknesses in the overall ease of doing business (Figure 67) and in selected areas (Figure 68), notably:
	  • Enforcing contracts (Figure 37)
	  • Registering a property (Figure 37)
	  • Issuing construction permits (Figure 37)
	  • Government efficiency (Figure 72)
	  • e-Government and e-Participation of citizens, even if improving (Figure 73)
	  • Efficiency of the court system (Figure 76 to Figure 79)

Industry structure, specialisation & organisation: ***Strong professional services, tourism and shipping clusters, but weak cluster activity in most other sectors***	
• Strong professional business services, tourism and shipping sectors. (see Section 3.2)	• Low general development of business clusters and low levels of value chain integration. (Figure 80)
Firm characteristics, dynamism & sophistication: ***Strong entrepreneurial spirit, but a lack of entrepreneurial activities and support for entrepreneurship***	
• Strong entrepreneurial aspirations. (Figure 83) • Business make use of intangible assets. (Figure 86) • Firm resilience and adaptability after the crisis	• Very few large firms. (Figure 5) • Low entrepreneurial activity. (Figure 83) • Limited entrepreneurial infrastructure. (Figure 82) • Low-levels of business sophistication even if somewhat improving. (Figure 84, Figure 85)

Strengths	Weaknesses
Human capital: ***A well-educated work force, but lacking in science and technology-related skills***	
• Well-educated work force, with high levels of tertiary education. (Figure 89 and Figure 90) • A high proportion of the population with knowledge of a foreign language. (Figure 97)	• Low levels of graduates with science and technology qualifications. (Figure 92) • Low levels of vocational education enrolment. (Figure 91) • Low levels of digital skills. (Figure 96) • High levels of skills mismatches and overqualified workers. (Figure 98 and Figure 99)
Technology, innovation, and knowledge: ***Academic excellence does not translate into business innovation or technology adoption***	
• High levels of tertiary education. (Figure 89) • Strong tertiary-level academic capacities. (Figure 105) • Above EU average SME product and process innovation. (Figure 109)	• Low levels of national R&D expenditure and weak private sector R&D activity. (Figure 102 to Figure 104) • Low levels of inward international technology transfer and limited cooperation between academia and business. (Figure 107 and Figure 108) • Weak innovation system performance. (Figure 100) • Low levels of creative outputs and below EU average market and organisational innovation by SMEs. (Figure 101 and Figure 109)
Financial infrastructure: ***Cost and access to finance for businesses remain a problem***	
• The financial sector has stabilised after the fiscal and banking crisis. (Section 7.3) • Household borrowing costs in line with other countries. (Figure 113) • Variety of bank instruments supported by the EU and national funds available to SMEs, including start-ups. (section 10.2)	• Perceived weak financial market development. (Figure 110) • Relatively high borrowing costs for businesses. (Figure 113) • Limited availability of non-bank financing, such as equity, bonds and venture capital. (Figure 114)
Productive and physical infrastructure: ***Limited external connectivity and weak ICT development are constraints***	
• Good road infrastructure. (Figure 115) • Good ports and airport infrastructure.	• Low air and maritime connectivity, but air connectivity is improving. (Figure 116 and Figure 117) • Low performance of logistics services. (Figure 118) • Low ease of obtaining electricity supply and high cost of electricity. (Figure 119 and Figure 56) • Modest ICT infrastructure and digital economy development. (Figure 123) • Modest connection speeds and high cost of internet. (Figure 122 and Figure 57)

10.2 Cyprus' competitiveness issues and policy responses

Given the wide range of competitiveness drivers (and their associated indicators), it is extremely challenging to directly link specific drivers to competitiveness outcomes or to overall competitiveness performance. Moreover, both competitiveness outcomes and drivers are shaped by Cyprus' endowments (e.g. market size, geographical location, climate, natural resources, etc.) that also affect the country's economic structure. Furthermore, culture and social values, which are difficult to capture through the available indicators, can

also have an important influence on the behaviour of businesses, individuals and policy makers.

Keeping the above points in mind, the following discussion builds on the assessment of Cyprus' competitiveness strengths and weaknesses, and describes some broad key thematic areas where there appear to be important competitiveness issues. While the following sections inevitably emphasise potential areas for improvement it should, however, not be forgotten that the broad regulatory, institutional and market conditions in Cyprus are good. Moreover, although the indicator analysis shows some weakness in the business environment, many are well recognised by Cypriot policy makers, businesses and wider society. Policy initiatives have already been enacted or are under consideration to address weaknesses (or reinforce strengths). Nonetheless, it is reasonable to ask whether current or proposed policy measures are adequate or need further reinforcement.

Equally, while policy measures may be taken in the right areas, the effectiveness of their implementation and coordination warrants consideration. In many instances, it appears that the main issue for public policy is less the need for new measures but rather, improved implementation of existing ones through further coordination, monitoring and evaluation to enable fine-tuning.

Entrepreneurship and firm dynamism

With few large enterprises and limited foreign investment in productive activities, Cyprus will need to rely heavily on new firm creation and high-growth SMEs to drive employment creation and deliver productivity improvements that go beyond cyclical adjustments. Moreover, strong entrepreneurial capabilities and business flexibility are crucial assets to enable the economy to respond to external shocks and to make structural adjustments towards a more balanced and sustainable growth model. However, Cyprus shows need for improvement in entrepreneurship and firm dynamism, including the share of innovative enterprises. Within companies, the proportion of employees engaged in entrepreneurial activities (e.g. developing new products or setting up new business units) is low. And, even if indicators of entrepreneurial attitudes, aspiration and intention are similar to many benchmark countries, this does not appear to translate into a particularly dynamic business sector.

Weak entrepreneurship can be linked to several underlying contributing causes. To some extent, cultural and social attitudes—expressed, for example, through a preference towards employment in the family business or in established companies and the public sector providing a structured career path—appear to play a role. Also, the analysis points to a relatively weak entrepreneurial eco-system and support framework, limited business community interactivity (in terms of cluster development and value chain linkages) and a weak interface between business, research and academia. New, innovative and fast-growth enterprises are also confronted by more specific constraints that hamper early-stage and subsequent development phases, such as limited access to finance, especially non-banking finance.

Cyprus has already taken steps to stimulate and support entrepreneurship through recent policies targeting start-ups, high-growth and innovative firms. The *National Policy Statement for the Strengthening of the Entrepreneurial Ecosystem* adopted in 2015 sets out a range of measures to support entrepreneurship, including: providing tax incentives to promote investments in innovate SMEs and start-ups; the *Cyprus Startup Visa programme*, providing visas and support to entrepreneurs from third countries; and an advisory and mentoring facility targeting SMEs that has been set-up, in cooperation with the EBRD. As part of efforts to facilitate enterprise access to funding support, Cyprus is developing a centralised digital platform for submission and management of funding applications, with a pilot implementation covering applications for two grant schemes related to Youth and Women Entrepreneurship completed in April 2018.

Related private-sector initiatives include *Startup Cyprus*, an organisation that aims to create a start-up ecosystem in Cyprus, by giving support through networking, events and trainings and by engaging in policy advocacy. Also, financial institutions, consulting firms and other institutions are engaged in private initiatives to support the entrepreneurial system in Cyprus, such as the IDEA programme (an incubator and accelerator initiated and funded by the Bank of Cyprus) and the ARIS programme (a start-up service, providing innovating workspaces to aspiring entrepreneurs).

In addition, to systematically monitor and evaluate the impact of entrepreneurship, Cyprus joined the Global Entrepreneurship Monitor (GEM) in 2016. The aim of this initiative is to have a holistic and in-depth analysis of the entrepreneurial ecosystem in Cyprus (based on international standards and methodologies), to understand the factors that encourage or hinder entrepreneurial activity and to provide recommendations to policy makers (taking also into account benchmarking with other countries in the EU and worldwide).[16]

It is too early to assess the impact and effectiveness of the Cypriot authorities' multipronged approach to address entrepreneurial shortcomings. Moreover, instituting broader changes to societal norms and attitudes will be a long-term process. Momentum is important, as inspiring success stories of firms and entrepreneurs engaging in new, non-traditional sectors and activities can strongly contribute to shifting attitudes. Similarly, exposure is important, as first-hand experience with new activities or technologies is equally inspiring.[17]

Similarly, raising awareness of initiatives to support entrepreneurship, not only within Cyprus but also further afield, can stimulate and encourage firms and individuals to pursue their entrepreneurial activities. In all these areas, there appears to be scope for development of a promotion strategy for entrepreneurship, both directly by the public sector and through increasing wider media attention.

Recommendations:

- **Further encourage and facilitate investment in high value-added and innovative activities and sectors.** In recent years, Cyprus has introduced multiple initiatives to strengthen entrepreneurship. Efforts should continue to strengthen activities to raise awareness and promote entrepreneurship, and to specifically target high value-added and innovative activities and sectors.
- **Ensure continued oversight, monitoring and evaluation of entrepreneurship performance and actions.** As foreseen by Cyprus participation to GEM, and acknowledging the interaction across multiple policy areas, Cyprus should continue efforts to develop a holistic approach to entrepreneurship and firm dynamism.

NB. The GEM country reports for Cyprus (University of Cyprus, 2018) contain an extensive list of specific policy recommendations to strengthen entrepreneurship in Cyprus.

Best practice: Tech Park in Georgia

Georgia is far less developed than Cyprus, and is typically ranked below Cyprus in competitiveness indices. At the same time, reforms and policy initiatives in Georgia are often innovative and impactful, as evidenced by Georgia rising to the sixth position in the most recent World Bank Doing Business index.

The Tech Park in Tbilisi, Georgia is a flagship project of the Georgia Innovation and Technology Agency, supported by the World Bank. The Tech Park provides exposure to new and emerging technologies, and allows young and aspiring entrepreneurs to experiment and to collaborate.

The Tech Park is not to be confused with more traditional science or technology parks. It does not

[16] See: https://www.gemconsortium.org/country-profile/145

[17] The success of technology-oriented start-ups in Israel is instructive. Strong contributors to this success are the exposure of young Israelis to technology in the Defence Forces, and the momentum generated by the initial success of a few high-profile start-ups.

provide facilities or space to tenant enterprises, including start-ups. Rather, the focus of the Tech Park is to promote (youth) entrepreneurship and familiarity with new and emerging technologies.

Facilities include incubators, training centres, laboratories equipped with 3-D printers and other machines, a digital library, meetings and conference space, offices and recreational areas. The Tech Park also organizes trainings and events, including, for example, an SME banking conference and trainings on the business model canvas tool.

There are comparable initiatives in Cyprus, such as the "makerspace" at the Centre of Entrepreneurship at the University of Cyprus, the Youth Makerspace in Larnaca (in cooperation with the municipality) and the private Fab Lab Cyprus in Nicosia. However, the Tbilisi Tech Park is an interesting example of how such an initiative forms just one of several elements of a coordinated entrepreneurship and innovation policy. For example, in conjunction with the opening of the Tech Park, the Georgian government introduced a programme that provides financial support to innovative projects.

Source: http://techpark.ge (in Georgian), and http://blogs.worldbank.org/europeandcentralasia/georgia-innovates-hidden-talents-are-revealed

Business linkages and interaction

The indicator analysis suggests weak development of business linkages in Cyprus, both within the country and across borders. This covers linkages among firms and industry sectors, as well as between the business community and other sectors, such as research institutions and the education sector. This is a potential concern because the size, depth and quality of the business eco-system (including suppliers of intermediate inputs, workforce and supporting institutions) affects the efficiency of business interactions, productivity and resilience. Moreover, strong business linkages, cluster development and value-chain integration are all potentially important for driving business development by providing opportunities for entering or expanding into new activities and markets, and by stimulating innovation. While business linkages and interaction are typically understood to be in the context of manufacturing industries, they are also important for service industries, particularly innovative and technology-oriented service industries like ICT.

Realistically, the depth and breadth of linkages developed in Cyprus or connecting Cyprus internationally cannot be expected to match those in larger and more diversified economies. Nonetheless, Cyprus could do more to strengthen linkages within the economy and internationally, in ways that could be mutually supportive and promote greater innovation. To an important extent, this concerns changes in business behaviour and the breaking down of 'silo mentalities' so that enterprises cooperate more and also look outside their own sector-boundaries, to identify, create and exploit innovation opportunities. Among policy instruments available to promote and forge linkages are matchmaking or networking events. Information portals can also play a role, as they facilitate information exchange, knowledge sharing and mutual understanding among economic actors. Increased efforts in this direction could be relevant for Cyprus. For example, there does not appear to be systematic efforts to create linkages between Cypriot SMEs, and between these and larger enterprises.

In the specific area of linkages between businesses and academia, mechanisms such as business incubators, training and workshops are all vehicles for promoting greater interaction and collaboration through increasing awareness of shared interests as well as commercial and knowledge capabilities. These can be supported by the public sector through financial instruments, such as grants or tax incentives for collaborative efforts and creating appropriate frameworks that provide incentives for academics to seek out partnership and cooperation opportunities with businesses. In this context, several promising initiatives and policies have been proposed or

are already implemented by the Cypriot authorities, including the promotion of collaboration between academics and business through national framework programmes, the new legislation facilitating university spin-offs which entered into force in July 2018, and the proposed establishment of a central technology transfer office at the Research Promotion Foundation.

At a more fundamental level, it is important to have an appropriate legal framework, including intellectual property rights (IPR) protection that supports different modes of collaboration between organisations. For example, IPR matters for how businesses manage their intangible assets in value chains, and the extent to which they are willing to transfer technology. Cyprus' legislation on Intellectual Property Rights and Copyrights is fully harmonised with all relevant and applicable EU Directives and Regulations. Cyprus is also in the process of modernising the legislation on Trade Marks with the aim of harmonising with the latest Trade Marks Directive. While the indicator analysis points to some weaknesses in intellectual property rights protection, improvements are very significant. (Figure 69 and Figure 70)

Finally, with multiple existing policies and initiatives, there is a need for better coordination of policies and their implementation. For example, linking the promotion of academic and business collaboration with economic diplomacy would enhance both efforts. In particular, it would allow enhance the international, cross-border aspects of academic and business collaboration, by leveraging the diplomatic network of Cyprus. Similarly, economic diplomacy would benefit from being directly linked with the academic and business community. More generally, and not limited to this specific example, a more centralised coordination of efforts would enhance the impact of most of these efforts.

Recommendations

- **Support the integration of Cypriot firms in the supplier networks of large international companies**. Cyprus should consider opportunities and support programs to assist local SMEs to supply higher value-added products and services to large international companies. Initially this could target multinational corporations present in Cyprus and, through this exposure, extend integration of Cyprus in global value chains. This may build on Cyprus recognised expertise in shipping and professional business services to include other fields (e.g. ICT services), while being aligned to strengthening Cyprus position as a regional business hub.
- **Such support would have to help businesses in both establishing and sustaining linkages.** This includes the monitoring of technology and industry trends, or feasibility studies, to identify promising activities and linkages. A matchmaking facility or trade missions, among others, would support the creation of first contacts. To create and sustain linkages, targeted support might be needed, addressing constraints related to access to finance, skills, quality upgrading, among others.
- **Enhance connectedness and collaboration between the business community and tertiary-level education and research.** Building on reforms to enable more commercially-orientated activities of academic research (including formation of spin-off companies), Cyprus should further promote collaboration between academia and the business community, both domestically and at an international level.
- **Enhance coordination and exploitation of synergies of actions promoting business linkages and interaction.** There are multiple policies and initiatives that directly or indirectly have the potential to support strengthening of business linkages and interaction. Often these appear to be implemented in isolation and there may be opportunities to enhance effectiveness and efficiency through improved coordination.

Best practice: Technology Demonstration Program in Canada

The Canadian Technology Demonstration Program supported large scale technology projects in selected key sectors between 2013 and 2017. This program aimed to demonstrate the feasibility of technologies, moving them closer to a commercial application. Projects were collaborative, typically included one larger lead company, and always had to include at least one SME and one university. The Government of Canada provided matching grants, typically covering labour costs related to R&D, as well as materials and equipment. In 2018 the Technology Demonstration Program was merged into the Strategic Innovation Fund.

The scale of the Canadian program would be hard to replicate in Cyprus. Two key lessons emerge, however. First, the program focused on specific sectors, thereby ensuring spillovers across projects. This may be of even greater importance in Cyprus, where limited resources may need to be targeted to a more focussed innovation and research effort. Second, the program emphasised collaboration, forging links between larger and smaller enterprises and universities. Given the absence of large enterprises, in Cyprus this role could also be filled by multinational enterprises or the public sector.

Source: http://ito.ic.gc.ca/eic/site/ito-oti.nsf/eng/h_00837.html

Adoption of digital technologies

Low rates of adoption of digital technologies are associated with lower productivity growth potential and long-term growth prospects, alongside negative spillovers from reduced opportunities for trade and foreign direct investment attraction. Fundamentally, given the transformational nature of digital technologies across diverse sectors and activities, low technology adoption engenders risks for modernising and adjusting the structure of the economy and its flexibility to respond and adapt to shocks.

Adoption of digital technologies by firms, the public sector and the general public is an area where Cyprus lags many benchmark countries. This situation is captured by a range of indicators on the use of digital technologies (Figure 106) and reflected in the very limited contribution of ICT assets to GDP growth (Figure 44). It also goes together with apparent low levels of digital skills (Figure 96).

Cyprus weak digital performance can be traced back to multiple potential sources. It may be partly cyclical, due to the fiscal and banking crisis holding back private investment, and ongoing problems of access to finance for business investment. There may also be structural issues arising from the dominance of SMEs that may lack the resources and capacity – financial or human – to invest heavily in digital technologies, or from the composition of the economy, which is heavily oriented towards service activities, including tourism. High costs of internet access are probably also a major reason for low internet usage rates in Cyprus. Digital illiteracy is also a problem for Cyprus. Cyprus ranks 19th among EU Member States for digital connectivity according to the European Commission's Digital Economy and Society Index (DESI, 2018), mainly due to the low take-up of ultra-fast broadband networks.

There are also questions arising in relation to the diffusion of digital technologies, especially where the returns on investment rely on attaining a critical mass of users; for example, adoption of B2B electronic invoicing requires enough firms capable of submitting and receiving electronic invoices before such solutions can 'take-off'.[18] Similar considerations apply for e-Commerce and e-Government (or e-Governance) technologies that require sufficiently developed soft ICT infrastructure and digital skills within the general population to make investments worthwhile.

[18] The Ministry of Finance is currently developing the appropriate technical infrastructure for the exchange of electronic invoices between the private and public sector in a co-financed programme with the European Commission. See http://www.e-invoicing.gov.cy

The Government of Cyprus has multiple ongoing initiatives to support digitalisation, as set out in its *Digital Strategy,* which itself is planned for revision. These include the Government Gateway Ariadne, providing a range of electronic services to citizens and businesses. Meanwhile, discussions are taking place for the introduction of the use of e-Signatures and e-Authentication, which should further facilitate the uptake of electronic services by both the public and private sectors. One important initiative for business start-ups is the development of the Platform for the Digitalisation of all grant schemes for enterprises. The system will provide the possibility for online submission of applications, it will support the whole procedure of managing applications (submission, review, approval/rejection, implementation, payment, monitoring etc.) and it will also provide administrative information. Also, to support the adoption of digital technologies and stimulate demand for broadband services, the Government organises awareness campaigns, seminars and workshops to promote digital society, to inform citizens and businesses about the benefits of using ICT and the internet, and to build-up the necessary trust.

Recommendations:

- **Provide digitalisation incentives for key sectors of the economy.** Incentives in the form of financial or other support could be provided to key 'traditional' sectors (e.g. tourism, shipping) to enable and enhance the efficiency of operations and participation in the digital economy. Such measures may be extended to new activities and innovative start-ups beyond 'traditional' sectors, to support economic diversification and specialisation.
- **Strengthen education and training (all levels) for digital skills.** This includes the promotion of existing ICT university programmes in high schools, with the aim of increasing awareness and interest in such study opportunities among high school students. It also includes the promotion of vocational education and training for adults, and the promotion of ICT education and life-long learning targeted to women. More broadly, promoting the attractiveness of ICT services as a career path.
- **More broadly, incentivise productivity enhancing investments.** Fixed investment is skewed towards construction and real estate, with limited private investment in productivity enhancing capital, R&D and innovation activities. Alongside efforts to improve access to finance and encourage domestic and inward investment, investment activity should be monitored and additional measures to ensure an adequate contribution to enhancing productivity and competitiveness implemented if necessary.

NB: Additional recommendations relating to ICT services are listed in Chapter 9 (Section 9.3 on page 147)

Access to finance

In general, limited access to finance can be expected to constrain the creation and expansion of businesses and investment into new activities and technologies, which may help to explain limited firm creation and a low number of high-growth firms observed in Cyprus. A lack of specialised financial services such as trade credit can affect competitiveness outcomes in areas like trade or foreign direct investment.

Businesses in Cyprus face a lack of affordable, accessible and sufficiently targeted sources of finance, both generally and to meet firm specific needs. This situation was exacerbated by the fiscal and banking crisis, which itself represented a symptom of underlying weaknesses, including a heavy reliance on a few financial service areas, such as real estate and collateralised lending. The indicators analysed in this report suggest, not only high borrowing costs (Figure 113), but also limited use of equity financing and specialised financial services such as venture capital (Figure 110 and Figure 111). Cypriot firms' external finance comes almost exclusively in the form of bank loans or other forms of bank financing (Figure 114). Findings from the European Investment Bank Investment Survey for 2017 indicate that, although firms in Cyprus that used external finance are, on balance, satisfied with the amount, cost, maturity

and the type of finance received, collateral requirements are an important obstacle, with 21 percent of companies reporting them as a source of dissatisfaction.

Constraints on access to finance for business are likely to persist, for several reasons. The small size of Cyprus' market means that it is not of particular interest to foreign banks and financial services providers that could broaden the array of financial instruments and services available to Cypriot firms. This is of relevance given the prevalence of small and medium sized enterprises, which are rarely able to access international financial markets, even within the EU. Furthermore, costs and risks for financial providers of servicing SMEs is typically higher than for larger enterprises, raising the overall cost of banking activities.

There is no scarcity of studies and reports on the Cyprus banking system, in particular with regard to the issue of non-performing loans and their impact on the banking system's stability.[19] Policy recommendations follow from these reports, and include debt restructuring and enhanced cooperation between borrowers and creditors, strengthening the bankruptcy framework, improving credit modelling and scoring, prudent fiscal policies and more generally, promoting balanced and sustainable growth (IMF, 2017). To further mitigate issues around non-performing loans, in 2018, the government enacted a series of more far reaching laws, in the context of a comprehensive strategy, to mitigate the problem. A new sale of loans law allowed creditors to break mortgages apart into multiple pieces and to give loan buyers more access to data that allows them to assess debtors' ability to pay. A securitization law was also approved. While aimed primarily at strengthening the banking system and reducing the burden imposed by non-performing loans, these policies should eventually help ease access to finance for enterprises.

Beyond efforts aimed at the banking sector itself, Cypriot and EU policy makers have long identified the need for improving access to finance through interventions. Several initiatives are underway, including new legislation facilitating major investments and the work of collective investment funds, the *Advice for Small Business Facility* with EBRD, various grant and lending schemes such as the *Cyprus Entrepreneurship Fund*, among others (Unit for Administrative Reform, 2018). The provision of trade credit was previously facilitated through the *EIB Trade Finance Facility* and is currently facilitated by the *EBRD Trade Finance Facility* through commercial banks.

There are also various EU policies and initiatives. These include *COSME* (EU programme for the Competitiveness of Enterprises and Small and Medium-Sized Enterprises), which aims to ease access to loans and equity finance for SMEs (though Cyprus has not used this facility). Also relevant is the SME instrument in the Horizon 2020 Framework Programme for Research and Innovation, supporting innovation projects with grants and risk finance. This includes, among others, *InnovFin* (EU Finance for Innovators) that supports innovative SMEs and entrepreneurs with direct loans, guarantees and other products. Two Cypriot banks already participate in this programme.

There are reasons to be optimistic that constraints on access to finance will ease over the long-term, at least as far as more traditional bank finance is concerned. Nevertheless, given the range of activities by different institutions and organisations, it is crucial that policies are coordinated and monitored. Furthermore, coordination is also needed with related policy areas, such as entrepreneurship support, business innovation or linkage creation. This, again, would be an important role for the new Economy and Competitiveness Council, as an advisory body.

[19] The Independent Commission on the Future of the Cyprus Banking Sector (2013), recommended improved financial supervision and corporate governance, while emphasising the continued importance of the banking sector as a component of the Cyprus economy. European Commission (2018b) and IMF (2017) note a lack of progress in reducing non-performing loans and their consequential risks for the recovery process.

Recommendations

- **Improve access to, and availability of, alternative sources of finance.** Alongside ongoing efforts to strengthen the banking sector (including addressing non-performing loans), measures are necessary to improve access to, and availability of alternative sources of finance (e.g. venture capital, equity funding, crowdfunding)
- **Explore the feasibility of a national venture capital fund, such as YOZMA, presented in the Box below.** This would entail exploring the potential demand for venture capital, the potential interest of international investors, the legal and financial aspects, among others.

Best practice: Venture capital in Israel

Government policies that promoted access to venture capital were and are critical to the success of Israeli start-ups. In 1993 the Israeli government created the YOZMA group (Hebrew: *initiative*) with a starting capital of 100 million US-dollar. The aim of YOZMA was and is to provide venture capital by attracting international venture capital investors in innovative technology sectors such as ICT or biotechnology.

YOZMA created several public-private funds and in some cases invested directly into start-up companies. The ultimate objective was to fully privatize these funds and investments, by allowing private partners to buy out the government share. Private investors were primarily foreign, in particular from the United States.

Beyond providing venture capital, YOZMA also provided further support to start-ups. These included efforts to improve access to finance, by directly linking start-up with foreign investors or facilitating access to other sources of finance.

Other business development services included the promotion of linkages and cooperation with academia, research institutions, ad technology incubators. YOZMA also assists by identifying and recruiting management or research staff, or board members, or by supporting in the development of business strategies.

Source: Baygan (2003)

Human capital

Evidence from the indicator analysis, together with stakeholder interviews, paint a mixed picture of Cyprus' human capital situation. On one hand, Cyprus invests heavily in education when measured as a share of GDP (Figure 95) and the work force is well-educated and capable (Figure 89). There appears to be a consensus that the general-level and availability of skills is good, particularly with respect to some of the main economic sectors that require, for example, administrative, legal or accounting skills. On the other hand, stakeholders point to gaps and shortages in some key areas, notably for more technical and specialised skills, especially those associated with new and emerging non-traditional sectors and economic activities. This is reflected, more generally, by indicators of skills mismatches, both in terms of apparent over-qualification of workers and the correspondence between area of education and sector of employment. (Figure 98 and Figure 99)

These findings point to issues concerning the quality and effectiveness of the education system, and its alignment with more sector specific needs, and the types of skills that can be expected to be in high demand in the future. While human capital does not present an overly pressing competitiveness issue today, action may be required now to prevent it becoming one in the future. While it is beyond this report to provide detailed recommendations for policies to promote a more forward-looking and flexible education system, it seems that a careful assessment and monitoring of Cyprus' future skills needs would be appropriate. The work of the Human Resource Development Authority is pertinent in this respect and should be further enhanced. The new Economy and Competitiveness Council could play a role in bringing business, educators and policy makers together to develop a future-skills strategy and skills foresight activities.

Recommendations

- **Continue with the forecasting of employment needs by the Human Resource Development Authority of Cyprus.** Potentially these efforts can be strengthened by building on the experience of Ireland (see Box below).
- **Raise the number of graduates with technical and natural science qualifications.** This should include efforts to promote Science, Technology, Engineering and Mathematics (STEM) training and education and of associated future career opportunities in these disciplines.
- **Strengthen education and training (all levels) for digital skills.** This includes the promotion of existing ICT university programmes in high schools, with the aim of increasing awareness and interest in such study opportunities among high school students. It also includes the promotion of vocational education and training for adults, and promotion of ICT education and life-long learning targeted to women. More broadly, promoting the attractiveness of ICT services as a career path.
- **Strengthen education and training (all levels) to support entrepreneurship.** This includes promotion of entrepreneurship courses in schools, universities, and vocational training and life-long learning programmes.
- **Improve alignment of education and training outputs to sector skill requirements and improve educational efficiency** and **enhance monitoring of trends in sector skill requirements and strengthen anticipation of future skill needs.** Existing skills mismatches and expected changes in future skills needs indicate a need for realignment of education outcomes to better meet current and future businesses-sector skill requirements.

Best practice: Expert Group on Future Skills Needs

The Expert Group on Future Skills Needs in Ireland assesses, and forecasts current and future skills needs of the Irish economy, thereby ensuring that the education system can provide the skills required on the current and future labour market. Established in 1997, the Expert Group advises the Department for Education and Skills, and the Department for Business, Enterprise and Innovation, as the departments involved with the demand and supply side of skills. The Group is supported by the Skills and Labour Market Research Unit, providing data and analysis on skill and maintaining the National Skills Database. This database provides information on employment and labour market developments, information on the characteristics of occupations and forecasts for the demand in specific occupations. The group also provides skills foresight and benchmarking, expert advice on skill formation through education and training activities, monitoring of employment and educational policies.

Source: http://www.skillsireland.ie

External connectivity

External connectivity concerns the availability, affordability, frequency and directness of passenger and freight transportation links by air and sea. In the digital era, it also concerns the availability and quality of externally connected digital infrastructure and service provision.

Cyprus' limited air transport connectivity (Figure 117) can be attributed to several factors, including its small domestic market and peripheral location, placing it at some distance from major European air transport hubs. According to Airports Council International (2018), Cyprus has considerably improved its direct air connectivity (i.e. the number of direct air services available from Cypriot airports) but is lagging in hub connectivity (i.e. the number of destinations available through connecting through major hub airports). This reflects considerable success in attracting charter flights, but also indicates a need to also improve the connectivity to major hub airports.[20]

[20] While direct flights benefit the tourism industry, business travellers might benefit more from more frequent flights to major hubs, allowing them to reach a large number of international destinations with minimal layovers.

For maritime transport, Cyprus has a strategic location at the intersection of major international and regional shipping lanes, meaning that despite its small size Cyprus has relatively wide and regular maritime connections (Figure 116). Similarly, Cyprus has reasonable telecommunications and data connectivity, (Figure 120 and Figure 122) but costs are high by European standards (Figure 57).

For a small island economy such as Cyprus external connectivity matters. Connectivity constraints raise the cost of exporting final goods and services, and the cost of importing raw materials and intermediate inputs. Given the importance of business-related services and tourism, constraints related to air connectivity, such as high costs or a lack of direct routes, tend to be more widely felt than constraints on freight transportation for physical goods.

Nonetheless, although Cyprus appears to have little potential for large volume manufacturing, its attractiveness for low-volume and specialised high-value manufacturing activities is vulnerable to freight transportation constraints. This could be of increasing concern given developments in manufacturing production technologies and process organisation – e.g. automation, digitalisation and data exchange, additive manufacturing (3D printing), internet of things, among others – that have the potential to facilitate the integration of enterprises from small and dispersed locations in manufacturing value chains. As with business-related services, a particular type of air connectivity matters – not the sheer number of (leisure) destinations, but rather frequent and conveniently timed connections to major hub airports.

More broadly, weak connectivity, whether physical or digital, can have a detrimental impact on the exchange of ideas and technologies, and the creation of international production, investment and innovation linkages. Failure to address connectivity issues could bring the associated that Cyprus may be unable to benefit from developments that could enable productivity improvements or stimulate innovation and, thereby, undermine medium to longer term growth prospects.

The issue of connectivity is also relevant in the context of Cyprus' potential as a regional business-hub. Improvements to Cyprus connectivity, particularly to key business locations in nearby countries, should increase Cyprus' attractiveness for regional headquarter operations and enable it to better exploit opportunities arising from its strategic geographical location.

Efforts are already underway to improve external connectivity. In the area of digital technologies, this includes the formulation of a *Digital Strategy* mentioned previously. In maritime transportation, these efforts include major investments in infrastructure and the deregulation and privatisation of sea ports. In air transportation, an open skies policy has been adopted, and the airport operator Hermes Airports offers incentives for airlines developing their business in Cyprus. Also, under the EU's public service obligations in air transportation, there is the possibility to award route monopolies to airlines on underserved routes and provide compensation for airlines' operational losses.[21]

Cyprus does not have a unified national transportation strategy covering maritime and air connectivity, and allied to the needs of the Cyprus business sector. This is a significant policy gap deserving attention and further study.[22] Such a strategy should avoid focusing exclusively on the infrastructure aspects of transportation but should also consider enhancing connectivity as part of the promotion

[21] Currently, for Cyprus the only public service obligations route is between Larnaca and Brussels, served by Ryanair. This route is not restricted, and no compensation is provided to Ryanair. See https://ec.europa.eu/transport/sites/transport/files/modes/air/internal_market/doc/pso_inventory_table.pdf.

[22] Digital connectivity should not be completely ignored in such a unified transportation strategy, also given how both the demand for and the supply of transportation services are increasingly shaped by the digital technologies. At the same time, digital connectivity is already covered by the *Digital Strategy* and other policies.

of Cyprus as an attractive location for business operations and investment.

Recommendations:

- **Formulate an international transportation / connectivity strategy** and **assess options to incentivise international connectivity to business partner locations.** This should target strengthening of business-related international connectivity. (e.g. with investor and, business collaborators locations) and enhancing Cyprus' position as a regional business hub.

Best practice: Aviation policy in the Netherlands

One of the largest aviation hubs in the world, Amsterdam Schiphol airport has the mission to connect the Netherlands, and to thereby contribute to prosperity and well-being in the Netherlands and elsewhere. Faced by infrastructure capacity constraints, the Dutch government selectively develops Schiphol's connectivity by prioritising airlines and routes, particularly hub operations, and high business demand intercontinental and European destinations.

A similar approach could be employed in Cyprus by developing a connectivity strategy adjusted to the wider needs of the Cyprus economy and population; for example, recognising both the importance of tourism for the Cyprus (requiring promotion of routes to bring leisure visitors to the island) and, simultaneously the needs of other sectors requiring connections to key business-related destinations.

Schiphol airport is majority-owned by the government and the municipality of Amsterdam, facilitating the implementation of this aviation policy. In contrast, Larnaca and Paphos airport are managed and controlled by Hermes Airports under a 25-year build, operate and transfer concession agreement.

Despite being a private operator, Hermes Airports has already taken the initiative to improve Cyprus' connectivity, in line with government policy, and in cooperation with the Department of Civil Aviation and the Ministry of Communications and Work. With a focus on connectivity as a key driver of tourism, activities have raised, for example, the number of airlines from 20 to 70 in the last 12 years. Further improvements to the Hermes Airport incentive scheme might aim to fine-tune priorities by integrating an assessment of the needs of the business community, in addition to tourism.

Source: Burghouwt (2017)

10.3 Towards a long-term strategy

The previous section described some of the key areas where the analysis undertaken for this report suggests that policy intervention to support Cyprus' competitiveness could be warranted. These reflect findings that are based on past developments and the current situation. However, national competitiveness contains a forward-looking dimension that is concerned with sustaining growth and living standards beyond the near-term.

Efforts to address current competitiveness issues can be expected to increase the adaptability and responsiveness of the economy and, thereby, contribute to maintaining and strengthening competitiveness in the longer-term. By itself, a policy approach focussed on current competitiveness issues and the implementation of policies designed to catch-up with top-performing countries does not necessarily provide a sound basis for ensuring competitiveness over the longer term. To achieve long-term competitiveness requires some definition of a strategic vision that provides the basis for a longer-term competitiveness framework. This requires looking beyond immediate needs and competitiveness concerns and, instead, considering how well Cyprus is positioned to respond to emerging opportunities and potential risks over the longer-term. It may also encompass consideration of opportunities and constraints arising from broader long-term strategic policy frameworks and commitments, including those at EU and global levels (e.g. UN Agenda 2030 Sustainable Development Goals).

A longer-term forward-looking strategic approach to competitiveness requires posing and providing answers to fundamental questions about the future shape of the economy: 'What will be the future sources of growth for Cyprus?', 'Will these sources be found in existing sectors and activities or in new, non-traditional ones?'. As a starting point to answer such questions, a full assessment of the competitive strengths and weaknesses of the economy is required. This assessment should consider how these strengths and weaknesses may support or hinder the development of existing economic sectors and activities, and how they may support or hinder the future emergence of new, non-traditional sectors and economic activities. In turn, the assessment should be set against an evaluation of possible future threats and opportunities and their impacts on the growth and value creation potential of the economy, whether in existing sectors and activities or in new ones.

A few sectors – such as tourism, professional services, financial services and maritime shipping – occupy key positions in the Cypriot economy. These sectors build on the key strengths of Cyprus, while influencing the country's strong performance in specific competitiveness areas. For example, the business environment has evolved in response to the needs and demands of some professional services and is geared to supporting these services. Cyprus' recovery from the banking crisis and its strong recent growth performance demonstrates the viability of its pattern of sectoral specialisation and supporting business environment for key sectors.

It is apparent, nonetheless, that some sectors face limits to their growth potential and external threats that could significantly affect their viability. Tourism, for example, has long been a cornerstone of Cyprus' economy and contributed substantially to the recovery of Cyprus after the banking crisis. At the same time, because of its high labour intensity, tourism is a sector where it can be difficult to realise productivity gains. It is also vulnerable to a host of external factors largely beyond the control of the sector itself or Cypriot authorities; these include competition from other tourism destinations, changes in demand patterns, a contraction in overall demand due to economic, social or geopolitical events, and negative impacts of climate change and desertification.

Elsewhere, other key service sectors face similar challenges arising from limited room for productivity improvements or vulnerability to external shocks; for example, financial services could be challenged by a resurgence of the Euro crisis, while growth in professional business services and maritime shipping are linked closely to regional and global macroeconomic and socio-political developments and cycles.

In contrast to many of the 'traditional' sectors occupying key positions in the Cypriot economy, ICT services – explored in more detail in Chapter 9 – is a relatively new but growing sector in Cyprus. It offers significant growth opportunities, whether through high-value employment, productivity gains – both in the sector itself and in other domestic sectors – or exports. ICT services present important opportunities for growth and there are several competitive strengths that the sector can build on, such as Cyprus' access to the EU Digital Single Market or the high levels of educational attainment of Cyprus' workforce. At the same time, there are weaknesses – common across ICT and many other sectors – that affect Cyprus' competitiveness in ICT services. These include many of the factors already described in this report: access to finance limitations, lack of specific skills, poorly developed business connections (i.e. linkages, clusters and value chains), etc.

Manufacturing, of limited importance of Cyprus' economy today, is another sector that faces a paradigm change. Developments such as Industry 4.0[23] offer new opportunities

[23] Industry 4.0 can be defined as the next phase in manufacturing, driven by deep-seated technological transformation, including new technologies such as digital connectivity, big data, additive manufacturing (3D printing), advanced robotics, among others.

to smaller countries with a limited current manufacturing base, especially in combination with a strategic location and a well-educated work force. Similarly, the increasing importance of digital services and digital trade offers opportunities, building on existing strengths such as the strong cluster in professional services or the well-educated work force. Other sectors such as health or education also show strong potential but might require careful management and support to continue to grow in the future.

Table 4 offers a first assessment of some of the critical factors that could be built into a forward-looking strategic assessment of Cyprus' competitive situation, presented in the form of a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis. The shown strengths and weakness summarise some of the key aspects of Cyprus' competitive endowments and drivers described earlier in this report, as well as findings from other analysis. The opportunities and threats are mainly generic, in the sense that they are neither specific to Cyprus nor to sectors or activities. Eventually, such an analysis should be undertaken at a more detailed level, allowing the strengths and weaknesses, and opportunities and threats of relevance to specific economic sectors and activities to be identified. This, in turn, would allow a fuller assessment of which sectors or activities offer the greatest promise for future growth, value creation, and job creation. And, those sectors or activities that are potentially most exposed to future shocks and adverse circumstances.

Table 4 SWOT analysis

Strengths	Weaknesses
• Strategic geographical location • EU membership and strong relations with countries of the former Soviet Union and Middle Eastern countries • Strong clusters in professional services, shipping services, and tourism • Good general business environment • Well-educated work force and strong tertiary education sector	• Small domestic market • Small manufacturing sector • Absence of large firms • Lack of dynamism and innovation • Lack of diversification of sources of private finance • Moderate (lagging) innovation and technology adoption • Limited external connectivity.
Opportunities	**Threats**
• Increasing mobility of multi-national enterprises and their headquarters • Increasing importance of digital services and digital trade • Global value chains, industry 4.0, increasing integration of services and manufacturing	• External shocks to key sectors such as tourism, professional services, financial services, or maritime shipping • Resurgence of the euro crisis or similar macroeconomic disturbances • No deal withdrawal of the UK from the European Union • Global trade wars and/or increase in non-tariff and investment barriers • Climate change and desertification.

Set against the outcomes of a more comprehensive analysis of strengths, weaknesses, opportunities, and threats at a more detailed level, a forward-looking competitiveness strategy would place emphasis on those competitiveness drivers expected to be of greatest relevance to take advantage of future growth opportunities. This implies accompanying policies to target both strengthening of competitiveness drivers and, at the same time, policies to allow transformation of the economy towards high growth and high value creating sectors and activities. The overarching aim would be to enable the creation of a

national 'business model' that builds on underlying strengths, recognises underlying weaknesses, but that is focussed on enabling the economy to adapt and respond to emerging and potential future opportunities and threats.

Development of a forward-looking competitiveness strategy does not imply prescribing specific sectors and activities, but rather asking whether Cyprus could provide an environment to nurture their development and what kind of policies would be required to provide a legal, institutional and incentive framework that allows the organic exploration and discovery of new, promising sectors and activities by market participants. In essence, this is the philosophy behind the concept of smart specialisation (see Box)

Smart Specialisation Strategy (S3)

Smart Specialisation Strategy (S3) is a key component of the EU 2020 innovation plan and the EU cohesion policy, supporting cluster formation through the identification and prioritisation of strategic areas. Smart specialisation fundamentally is based on a process of entrepreneurial discovery. Entrepreneurs in a broad sense (firms, higher education institutions, independent inventors and innovators) are in the best position to discover the domains of R&D and innovation in which a region is likely to excel, given its existing capabilities and productive assets (Foray, David and Hall, 2011).

While S3 is typically focussed on innovation and R&D, it can be extended to embrace a broader interpretation for identifying and prioritising strategic areas of development covering all aspects of competitiveness, from the business environment to human capital. A broad-based Smart Specialisation Strategy approach is relevant., not only by linking to the EU-level policy approach, but also by providing a framework for the development of forward-looking competitiveness strategies and policy priorities.

While some degree of sector targeting may be inevitable, a forward-looking competitiveness strategy would not necessarily aim to change the sectoral make-up of the Cyprus economy but, rather, would aim to develop and promote those sectors and activities that can drive strong future growth, by exploiting and capitalising on Cyprus' competitive advantages. This might mean promoting existing sectors, by reinforcing existing strengths and addressing weaknesses to enable the sector to transform and upgrade itself. But it might also mean addressing weaknesses that act as barriers to the emergence of new and non-traditional sectors and activities. In either case, policy would recognise that the factors underlying Cyprus competitive advantage or disadvantage are not immutable but can be shaped by appropriately directed policy measures.

Identifying the conditions necessary and appropriate for promoting growth is difficult for sectors and activities that are not present in Cyprus and may be at a nascent stage even outside of the country. This requires an understanding of needs and drivers of competitiveness of these sectors and activities, which comes through interactions and exposure. In the case of emerging or nascent sectors and activities, it would include the repeated interactions between entrepreneurs, business associations and policy makers. This entails an ongoing process, which can continuously remain open to the discovery of opportunities.

Recommendations:

- **Develop and maintain a long-term competitiveness strategy.** Cyprus should consider the formulation of a long-term strategy and vision for sustainable competitiveness. This should incorporate an assessment of opportunities and strengths to build on, to enable the transformation of the economy towards high growth and high value creating sectors and activities.
- **Systematically monitor and identify opportunities and threats to both 'traditional' and new or emerging sectors and activities.** This should support the continuous appraisal of long-term strategy goals and assessment of appropriate policy development needs to exploit opportunities in promising sectors and activities and to counter emerging threats.

10.4 Competitiveness institutions

The preceding section sketched out some of Cyprus' key competitiveness issues and outlined some considerations for the development of a long-term competitiveness strategy. In this context, the recognition by Cypriot policy makers that there is a need for major structural reforms implies that many relevant reforms and policies are already being implemented or are under discussion. However, such significant activity places considerable demands on coordination and implementation capacities. This particularly applies to horizontal policies, spanning a variety of policy areas under the responsibility of multiple institutions.

Stakeholders interviewed for this report frequently expressed concerns about a perceived lack of policy coordination and monitoring, resulting in poor or delayed policy implementation. Moreover, while many areas in which reforms and policies are already implemented are relevant and important, the absence of a high-level strategy and articulation of a longer-term vision for Cyprus' economic development were pointed-out as major shortcoming. These observations support the rationale for the creation of the Economy and Competitiveness Council (ECC) in June 2018.

The success of the ECC will depend on many factors, but evidence from similar institutions elsewhere points to some key success factors. A competitiveness council should be detached from day-to-day policymaking and the pressures of the electoral cycle, allowing it to take a long-term, strategic perspective. A council needs the analytical capacity to provide strategic thinking and planning, and the requisite political influence to access policy makers and steer policy debates. It should also be able to oversee policy coordination and monitoring. Lastly, a competitiveness council needs broad political and societal support, across government departments, and stakeholders, including businesses, trade unions, academia, and civil society.

The ECC does not start from scratch. Cyprus has a history of institutions that meet some of these criteria. These include the Planning Bureau and its successor, the Directorate General for European Programmes, Coordination and Development (DG EPCD). It also includes the Unit for Administrative Reforms, which initially oversaw the creation of this first Cyprus Competitiveness Report, with assistance from the European Commission's Structural Reform Support Service. The Report itself should contribute to a greater institutionalisation of competitiveness analysis and policy formulation by providing evidence on Cyprus' competitiveness standing, and by highlighting areas in need of attention. Furthermore, if regularly updated and maintained, the Cyprus Competitiveness Report can serve as a tool for monitoring the coordination and implementation of competitiveness policy.

Recommendations:

- **Entrust the ECC with monitoring ongoing and proposed policies and initiatives.** The ECC could take both a broad view of the overall coherence and coordination of policy initiatives and measures and their effectiveness. Further, it could support or undertake the "competitiveness proofing"[24] of new policy proposals.
- **Given its independence and advisory role, the recommendations and advice of the ECC are not binding.** It would thus be prudent to evaluate after one or two years to what extent the recommendations and advice of the ECC have been taken into account or implemented by government authorities.

[24] Competitiveness proofing, as implemented by the European Commission, is a reinforced analysis of the impact that new policy proposals will have on the competitiveness of enterprises.

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Annex I: Competitiveness definitions and concepts

This Annex provides a brief introduction to the concept of national competitiveness, taking as its starting point some of the more widely known definitions of national competitiveness and summarising their common elements. It then looks at two of the main conceptual views of national competitiveness: the first based on a broad view of competitiveness that treats it as synonymous with national productivity, the second which take a narrower view that considers national competitiveness in terms of the ability to compete successfully in international markets and in attracting investment into productive activities. The section concludes with an overview of some of the identified key determinants of competitiveness (or productivity).

What is national competitiveness?

Definitions of national competitiveness

Competitiveness is a complex and multidimensional concept that is difficult to define, summarise and measure. However, the questions and issues at the heart of the concept of national competitiveness are basically those that policy makers and economic theorists have been trying to address for hundreds of years: a better understanding of the issues that are central to improving economic well-being and the distribution of wealth between and within nations (Cambridge Econometrics, Ecorys-NEI and Martin, 2003). However, even though improving a country's competitiveness is frequently presented as a central goal of economic policy, arguments abound as to precisely what this means. This is reflected through a multiplicity of definitions of competitiveness, each with their own nuances, and reflecting different understanding and interpretation of competitiveness and its determinants and outcomes; see Box 1 for some examples.

Box 1: Examples of national competitiveness definitions

"A nation's competitiveness is the degree to which it can, under free and fair market conditions, produce goods and services that meet the test of international markets while simultaneously expanding the real incomes of its citizens. Competitiveness at the national level is based on superior productivity performance and the economy's ability to shift output to high productivity activities which in turn can generate high levels of real wages. Competitiveness is associated with rising living standards, expanding employment opportunities, and the ability of a nation to maintain its international obligations. It is not just a measure of the nation's ability to sell abroad, and to maintain a trade equilibrium." The Report of the President's Commission on Competitiveness (1984).

"[Competitiveness] may be defined as the degree to which, under open market conditions, a country can produce goods and services that meet the test of foreign competition while simultaneously maintaining and expanding domestic real income" OECD (1992), Programme on Technology and the Economy.

"An economy is competitive if its population can enjoy high and rising standards of living and high employment on a sustainable basis. More precisely, the level of economic activity should not cause an unsustainable external balance of the economy

nor should it compromise the welfare of future generations." European Competitiveness Report (European Commission, 2000).

"[Competitiveness is] the set of institutions, policies, and factors that determine the level of productivity of an economy, which in turn sets the level of prosperity that the country can earn." World Economic Forum (WEF).[25]

"[Competitiveness is] the ability of a nation to create and maintain an environment that sustains more value creation for its enterprises and more prosperity for its people." International Institute for Management Development (IMD).[26]

Looking across the various definitions of national competitiveness illustrated in Box 1, three common elements can be identified that underpinning what may be regarded as the 'consensus view' of national competitiveness:

- **A successful economic performance,** typically judged in terms of rising living standards or real incomes, but which may include wider societal and environmental goals;
- **Open, free, and fair market conditions** for the goods and services produced by the nation in question. Such that there should be effective competition – actual or potential – from non-domestic producers;
- **A sustainable approach** such that short-term 'competitiveness' gains should not create imbalances that compromise a successful economic performance in the longer term. This can be viewed in terms of 'traditional' macroeconomic balances, such as the sustainability of current account deficits, or having supportable levels of public and private debt. Beyond these, sustainability may encompass broader environmental and social perspectives; for example, in terms of use of natural resources or preserving social cohesion.

Leading views of national competitiveness

Underpinning the various definitions of competitiveness, Ketels (2016) identifies two main views on the question of what is (national) competitiveness. These two views are outlined briefly in the following paragraphs. It is worth noting that although these views remain largely unreconciled in the literature, both can ultimately be translated in an understanding of competitiveness that places productivity centre stage.

Equating national competitiveness to national productivity

It is clear from the various definitions of national competitiveness (see Box 1) that productivity occupies a central role of in the concept of 'the consensus view' of national competitiveness. Under a '*productivity-based view'* of national competitiveness, competitiveness is synonymous with national productivity, as reflected in the statement by Michael Porter that:

"The only meaningful concept of competitiveness at the national level is productivity." Porter (1990)

This assertion reflects an understanding that the level of productivity achieved by an economy is the primary determinant of prosperity and, if the judgement on national competitiveness is based on national prosperity (e.g. living standards, real incomes), the notion of national competitiveness is linked inextricably to productivity. High

[25] See: http://reports.weforum.org/global-competitiveness-report-2015-2016/methodology.
[26] See: https://www.imd.org/wcc/world-competitiveness-reflections/the-global-competitiveness-report.

productivity – i.e. a high addition of value per unit of labour, capital and natural resources employed in production – supports high wages, attractive returns on capital, and a strong currency, and with them a high standard of living.[27] So a competitive economy is one that can achieve high levels of productivity; where productivity depends both on the value of nation's products and services and the efficiency with which they are produced.

Linking the somewhat-amorphous concept of competitiveness with the more clearly defined concept of productivity, allows for analysis of the factors that affect national competitiveness to draw from the wealth of theoretical and empirical literature analysis of the determinants of productivity and productivity growth. The question of "what factors determine competitiveness?" becomes a question of "what factors determines productivity?". This reformulation ties in to those definitions of competitiveness – e.g. as used by the leading international competitiveness rankings of IMD and WEF– that equate national competitiveness with the environment a country provides for value creation (by its enterprises), which essentially concerns the institutions, policies, and other factors that influence productivity.

Equating national competitiveness to international trade (and investment) performance

One problem with focussing on national-level productivity is that it drives a wedge between the concept of competitiveness and its international dimensions of trade and foreign investment. Growth in national productivity – and hence, under a productivity-based view, improved national competitiveness – can result from productivity improvements in non-traded sectors, without necessarily inferring anything about the ability of the country to produce and sell products and services in international markets, or to attract foreign investors.[28] Thus, at alternative view of national competitiveness – often motivated by concerns over macroeconomic balances, particularly the 'external' current account balance – is to emphasise its international dimension of competitiveness, by equating competitiveness with the ability of a country's enterprises to compete successfully in international (global) markets. And, by extension, for a country to successful compete in attracting investment into productive activities.

The view of national competitiveness as an extension of the performance of its enterprises in international markets – labelled by Ketels (2016) as the '*the cost-based*' or '*the market-share-based*' view of competitiveness – has been criticised on several accounts. Partly, because it is rooted in concepts of firm rivalry that equate competitiveness to competition in a 'zero-sum game', which does not recognise that prosperity in one country brings benefits for others whether through trade or other relations. Partly, also, because it tends to be associated with an emphasis on unit cost levels as a determinant of international competitiveness, which can motivate the pursuit of policies that drive down costs to stimulate exports but in so doing lower prosperity.

Both companies and policy makers have valid reasons to ask what determines the ability of enterprises to compete in international markets, and undoubtedly costs are an important factor. However, the real issue is what is the amount of domestic value-added embedded in exports of products and services. Such a view is taken by Robert Atkinson who states that:

[27] See Porter *et al.* (2008), Ketels (2016).

[28] To the extent that productivity increases in non-traded sectors reduce the costs of (non-traded) inputs used by firms in traded sector then this would have a spillover effect on their productivity and competitive position in international markets.

"[National] competitiveness is the ability of a region [country] to export more in value added terms than it imports." Atkinson (2013)

Once again, however, by focussing on value added the discussion is drawn back to the relationship between competitiveness and productivity, since productivity is a measure of the addition of value generated by each input factor (e.g., labour, capital, technology) used in production. The essential difference from the '*productivity-based view*' described previously is that what counts here is achieving high productivity levels in traded goods and services sectors, rather than the level of productivity across all sectors of the economy. Such a viewpoint is reflected in the definition of national competitiveness used by Ireland's National Competitiveness Council:

"Competitiveness refers to the ability of firms to compete in markets. Ireland's national competitiveness refers to the ability of the enterprise base in Ireland to compete in international markets" Irish National Competitiveness Council[29].

Setting the objective of national competitiveness

One conclusion that can be drawn from the preceding discussion is that arriving at a 'correct' definition of national competitiveness cannot be separated from the overall objective(s) ascribed to competitiveness in terms of desired outcomes. If the objective of competitiveness is defined widely, in terms of raising living standards of the population as a whole, then competitiveness can be equated with the level and growth of overall national productivity. Alternatively, if the objective of competitiveness is defined more narrowly, in terms of improving the ability of a country – or rather the enterprises based in a country – to compete in international markets, then national competitiveness can be equated with productivity in those sectors for which international markets for their products and services exist. Of course, gains in productivity in sectors subject to international competition – under open and fair conditions – will affect the overall national productivity and, hence, national competitiveness under its wider definition.

The importance of the distinction between the wide and narrow definitions of competitiveness is not independent from the size and openness of the economy. For large countries with correspondingly large domestic markets, trade typically accounts for a lower share of overall economic activity than is the case for small countries, and hence differentiating between national competitiveness (i.e. overall national productivity) and the international dimension of competitiveness (i.e. productivity in traded goods and services sectors). However, for smaller economies with small domestic markets, particular those with limited natural resources and where trade typically accounts for a high share of economic activity, the international dimension of competitiveness will play a greater role in determining overall national productivity and accordingly national competitiveness. This is increasingly the case as globalisation opens-up more economic activities to international trade.

What determines national competitiveness?

It may be convenient to define competitiveness with reference to its objectives or desired outcomes (e.g. rising real incomes, living standards, or prosperity). The real question for analysis of competitiveness, remains to identify those factors that explain

[29] See: http://www.competitiveness.ie/about-us/our-work

competitiveness rather than to describe its outcomes. Given the centrality of productivity to the notion of competitiveness, this requires addressing the question of the factors that determine and raise productivity? Before addressing this question, it is perhaps worth cautioning against allowing an undue focus on productivity to obscure the issue of translating productivity gains into higher wages and profits and, in turn, the analysis of institutional arrangements and market structures through which this occurs (Cambridge Econometrics, Ecorys-NEI and Martin, 2003).

As mentioned earlier, productivity measures how efficiently production inputs (e.g. labour and capital) are used to produce a given level of output; as such, productivity is commonly defined as a ratio of a volume measure of output to a volume measure of input use.[30] There are various measures of output but for present purposes, it is convenient – and arguably more relevant – to consider output in terms of value added (rather than gross output or turnover/revenue). Hence, productivity equates to the amount of value added generated for each unit of input used in production.

Determinants of productivity and productivity growth

The basic factors that combine to determine productivity levels – or short-run / static productivity performance – can be categorised as follows:

- **Inputs:** the cost and quality of production factors (e.g. labour, capital, intermediate goods, or technology inputs), together with that of any 'infrastructure' that supports production activities (e.g. physical infrastructure, productive infrastructure (e.g. utilities, logistics) or financial infrastructure (e.g. banking);
- **Processes:** the efficiency of production activities (e.g. production process that transform inputs into outputs), including also the quality of management functions, support services, supply chain organisation etc. and, more broadly, the industrial structures that influence production efficiency (e.g. through economies of scale or scope);
- **Outputs:** the value of production – as determined by the prices that products (and services) command on open markets – which, in turn, depends on aspects such as quality and specialisation, but also on non-tangible aspects (e.g. branding, intellectual property) and on overall market demand and supply conditions.

More difficult to categorise, are the factors that determine productivity growth over time – or long-run / dynamic productivity performance – for which the literature is ever expanding.[31] Essentially, at a national level, there are two ways of increasing aggregate productivity levels:

- **Increase the intensity of production factor use:** increase the utilisation of factors of production; for example, by having a higher level of employment (i.e. higher share of the population in work) or higher hours worked, or by having a higher rate of capital utilisation;
- **Increase the output produced by each production factor:** increase the output produced by each unit of production factors used; in other words, raising the productivity of labour, capital, and other production factors, such that total productivity (i.e. accounting for all production inputs) is increased.

While policy makers are concerned about both, particularly when low employment rates and capacity underutilisation make it important to increase the intensity of factor

[30] OECD (2001).

[31] See for example, Ketels (2016), OECD (2015).

utilisation, it is the second that constitutes the main focus of attention for improving prosperity or standards of living in the long run.

At a national level, productivity growth occurs not just through aggregate productivity growth. It can also result from a shift from low to high productivity sectors, i.e. higher productivity sectors account for an increasing share of the economy over time. From a policy perspective, this implies that national productivity growth is not just about raising productivity across the board or within sectors. It can also be about enabling resources to move from low productivity sectors into higher productivity sectors. In other words, there is a role for a 'structural transformation' element within 'competitiveness' policies aimed at raising national productivity.

To understand which factors determine productivity growth, it is often analysed using growth accounting frameworks that provide a decomposition by production factor inputs (labour, capital, and others).[32] While useful for observing the changing structure of the economy and identifying the factors that change productivity growth, growth accounting does not explain in itself how those factors work.[33] In fact, there is lack of a comprehensive framework that covers the multiplicity of factors that affect productivity and how these factors work. Various authors, including many of the international rankings and national competitiveness reports described in the Cyprus Competitiveness Report are underpinned by efforts to identify and categorise factors that determine productivity growth. As a starting point, the decomposition of productivity growth by production factors, indicates several broad themes: the contribution of human capital points to themes such as education, health or labour market efficiency; the contribution of capital points to themes such as investment behaviour, access to finance (to facilitate capital investment), and physical infrastructure; while the contribution of technology points to themes such as research and development, technology adoption and innovation behaviour. Further, attention to the efficiency of production activities and exploitation of value creation possibilities point to factors such as factor market efficiency, firm sophistication, industry linkages and clusters, business environment and competition conditions.

Through a literature review, Isaksson (2007) identifies human capital (education and health), infrastructure, input availability through imports, institutions, openness, market efficiency, access to finance, geography as prominent factors behind high levels of productivity. In addition, innovation and research & development contribute to productivity growth in industrialized, but not developing countries. Similarly, also through a literature review, Syverson (2011) identifies clusters and firm sophistication (e.g. management practices), competition, both domestically and through trade, regulation, and the efficiency of input markets such as labour markets, as key factors driving higher levels of productivity. Within its productivity framework, the UK government identifies five drivers of long-term productivity performance: investment, innovation, skills, enterprise and competition; see Box 2.

Box 2 UK Government's five drivers of long-term productivity performance

The UK Government's productivity framework identifies five drivers that interact to underlie long-term productivity performance:

[32] See for example, Oulton (2004).
[33] Office of National Statistics (2007).

Investment *is in physical capital – machinery, equipment and buildings. The more capital workers have at their disposal, generally the better they are able to do their jobs, producing more and better quality output.*

Innovation *is the successful exploitation of new ideas. New ideas can take the form of new technologies, new products or new corporate structures and ways of working. Such innovations can boost productivity, for example as better equipment works faster and more efficiently, or better organisation increases motivation at work.*

Skills *are defined as the quantity and quality of labour of different types available in an economy. Skills complement physical capital, and are needed to take advantage of investment in new technologies and organisational structures.*

Enterprise *is defined as the seizing of new business opportunities by both start-ups and existing firms. New enterprises compete with existing firms, with new ideas and technologies, thereby raising competition. Entrepreneurs are able to combine factors of production and new technologies forcing existing firms to adapt or exit the market.*

Competition *improves productivity by creating incentives to innovate and ensures that resources are allocated to the most efficient firms. It also forces existing firms to organise work more effectively through imitations of organisational structures and technology.*

Source: Office of National Statistics (2007)

Determinants of trade and investment competitiveness

Turning to the factors that determine trade competitiveness (i.e. the ability to create value through exports of products and services) and investment competitiveness (i.e. the ability to attract foreign investments in value creating productive activities), productivity remains of central importance and the productivity-related themes mentioned above remain relevant. Summarising and condensing a rich literature, the World Bank's Trade Competitiveness Toolkit (Reis and Farole, 2012) identifies a range of relevant broad themes – market access, the incentive framework, factor conditions, and trade promotion infrastructure. These are further divided into more narrow themes, as follows. Market access is a stand-alone theme, covering tariff and non-tariff barriers faced by exporters. The incentive framework is concerned with trade and investment policy, and other supporting policies such as competition policy or business regulation. Factor conditions mostly cover productivity-related themes, that is, access to finance, human capital, market efficiency, the presence of clusters, and trade facilitation and logistics. Lastly, trade promotion infrastructure covers export and investment promotion, standards and certification, special customs regimes such as special economic zones, industry coordination and support, and innovation.

There is a rich literature on the determinants of Foreign Direct Investment (FDI), although empirical work is hampered by the fact that FDI has different motivations, and that these motivations are hard to discern from the data.[34] Consequently, only broad themes such as geography, market size and access, and some aspects of the busi-

[34] The typical distinction is between resource-, market-and efficiency-seeking FDI. Resource-seeking FDI is mainly driven by the availability of natural resources or cheap labour; market-seeking FDI is driven by market size and access; and efficiency-seeking FDI is driven by factors such as productivity, human capital, innovation or institutions (Dunning and Lundan, 2008).

ness environment (lack of corruption and the ease of doing business) can be consistently identified as determinant factors of FDI (Blonigen and Piger, 2014; Eicher, Helfman and Lenkoski, 2012). As an alternative approach, the survey-based Global Investment Competitiveness Report (World Bank, 2018) identifies political stability and security, the legal and regulatory environment, market size, macroeconomic stability, human capital, and physical infrastructure as they key factors driving FDI.

Implications for Cyprus

Competitiveness challenges differ across countries. The competitiveness challenges for Cyprus will be different from the challenges faced by larger countries such as the UK or Germany, from centrally located countries such as the Netherlands, or from transition economies such as Estonia. As a small and open heavily services-orientated economy, at the periphery of the European Union, but at the crossroads of three continents, Cyprus faces unique challenges. The unique and fundamental characteristics of Cyprus and the challenges it faces have to be taken into account when defining, assessing, and evaluating the country's competitive position and performance.

An analysis of competitiveness focussed on productivity alone would have only limited relevance from a policy perspective, particularly if it failed to recognise the unique characteristics of Cyprus. Given the small size of the domestic market, the fact that Cyprus is an island, and its geographic location, outcomes such as trade and FDI performance deserve a prominent position in any assessment of the country's competitiveness. Moreover, for an economy that is highly orientated to services, a productivity focussed analysis would inevitably be confronted by the inherent difficulty in defining and measuring productivity in service industries. In this context, for the Cyprus Competitiveness Report, a rather generic definition of national competitiveness is used, which does not rely on a strong theoretical underpinning but allows for exploration of a wide scope of potential competitiveness factors or drivers.

Annex II: Competitiveness scorecard

Index	2015	2016	2017	2018	2019	Latest change	Source
Global Competitiveness Report (2019 edition)				43/136	44/140	-1	WEF
Global Competitiveness Report	58/144	65/140	83/138	64/137		+19	WEF
World Competitiveness Report			37/63	41/63	41/63	-	IMD
Ease of Doing Business	64/190	47/190	45/190	53/190	57/190	-4	World Bank
Corruption Perceptions Index	33/174	33/168	47/176	42/180	38/180	+4	Transparency International
Economic Freedom Index	41/177	46/178	45/178	48/180	44/180	+4	Heritage Foundation
Global Information and Technology Report	37/148	36/143	40/139			-4	WEF
Digital Competitiveness Index			53/63	54/63		-1	IMD
Travel and Tourism Report		36/141	52/136			-16	WEF
Logistics Performance Index		59/160		45/160		+14	World Bank
Global Innovation Index	34/141	31/128	30/127	29/126		+1	INSEAD, WIPO
Global Entrepreneurship Index	46/130	49/132	49/132	32/137		+17	GEDI
Global Talent Competitiveness Index		32/109	30/118	37/119	33/125	+4	INSEAD

Note: Cyprus rank/Number of countries: The year refers to the publication date of the report, and not necessarily the date the data was collected.

CYPRUS
COMPETITIVENESS REPORT

This is the first competitiveness report for Cyprus, providing an in-depth assessment and analysis of Cyprus' national competitiveness. Presenting more than 150 statistical indicators, the report provides an overview of the Cyprus economy, an assessment of the drivers of competitiveness across eight broad themes, and an assessment of social and environmental sustainability. Based on this analysis the report provides policy recommendations and identifies policy priorities. An in-depth assessment of the sectoral competitiveness of ICT services as an emerging and growing sector of the Cyprus economy is supplementing the analysis of national competitiveness.

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