



GLOBAL  
ENTREPRENEURSHIP  
MONITOR

# GLOBAL ENTREPRENEURSHIP MONITOR (GEM)

CYPRUS REPORT 2021/2022



University  
of Cyprus





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## FOREFRONT FROM THE DIRECTOR OF THE CENTRE FOR ENTREPRENEURSHIP

With the valuable support and sponsorship of the Ministry of Energy, Commerce, and Industry, the Centre for Entrepreneurship (C4E) of the University of Cyprus has compiled the National Report for Entrepreneurship, acting as the National Coordinator and Cyprus' representative in the Global Entrepreneurship Monitor (GEM).

We are delighted for this publication, as it gives us the opportunity to demonstrate our commitment to promote entrepreneurial culture throughout the country. Publishing the GEM National Report for the sixth consecutive year, we are in a unique position to observe long-term trends in our entrepreneurial ecosystem, and to compare the Cyprus's indexes in a meaningful way with those of other countries. Especially interesting are the comparisons with countries with which we share structural similarities, as well as with countries with more developed entrepreneurial culture and activities; countries which we aspire to emulate.

As in previous years, we report the results of two surveys: the Adult Population Survey and National Expert Survey. Both provide valuable insights into the country's efforts to emerge from the impact of the COVID-19 pandemic, and to return to economic and entrepreneurial normalcy, while dealing with new and unforeseen challenges, stemming from the war in Ukraine.

Among other positive findings, the National GEM Report shows that the Public's perception on the attractiveness of new entrepreneurial endeavours has rebounded strongly from the depths of the pandemic, and the prestige of funding and running a new business has never been higher. Challenges remain, especially in entrepreneurship education and the participation of women in entrepreneurial activity. We should strive to do more as a country. And we can do more armed with data. This year's report also includes a Special Section on Eratosthenes Centre of Excellence, demonstrating how the centre is paving the way for Cyprus to enter the space arena and shedding light into new avenues for the exploitation of research results.

Indeed, this report is a valuable tool for policy makers, as it furnishes the data needed to plan informed and targeted interventions that guide a national strategy towards entrepreneurship. The report's value is recognised by the Ministry of Energy, Commerce, and Industry, who has funded and supported us all these years, and by PwC Cyprus who embraced our effort by sponsoring our dissemination activities. We are thankful to have such dependable partners.

This year's report also includes a Special Section on Eratosthenes Centre of Excellence, demonstrating how the centre is paving the way for Cyprus to enter the space arena and shedding light into new avenues for the exploitation of research results.



Panos Markopoulos  
Director, Centre for Entrepreneurship

## FOREWORD BY THE MINISTER OF ENERGY, COMMERCE AND INDUSTRY

It is a pleasure to welcome the 6th GEM report for Cyprus. Today Cyprus is experiencing, like the whole world, one of the biggest crises of the last decades and expected to tackle a series of challenges caused by the economic crisis, the pandemic and the war in Ukraine. It is though my strong belief that the Cypriot economy can emerge stronger and gain back its position in the international stage. Still we need to find the right solutions and return dynamically to growth. The path towards this cannot be defined only by strict austerity measures, at the same time, growth measures are required. In this context, the Government recognizes entrepreneurship as one of the main drivers for job creation and economic growth based on knowledge, technological upgrading and innovation.

At the same time, prevailing market conditions indicate the need to stimulate the entrepreneurial mindset of young people, to encourage the development of innovative start-ups and to foster, in Cyprus, an ecosystem friendly to entrepreneurship. The main objective of the Government is the evaluation of the basic parameters that make up the current competitive environment and the implementation of the grand schemes in order to meet the real needs of the business community. Towards this the contribution of GEM is extremely important since it contributes to the measurement and evaluation of the country's entrepreneurship indicators.

In this context, I welcome the 6th GEM Report for Cyprus, which shows significant progress in perceptions about entrepreneurship:

- About 50% of the population find it easy to start a business.
- 58% believe they have the skills to start their own business
- 20.5% intend to be entrepreneurial in their own field.

The results of the 6th GEM Report are really encouraging and demonstrate that in business Cyprus is moving in the right direction. The perceptions of our people regarding the ease or the obstacles to becoming entrepreneurs and industry experts, undoubtedly play a crucial role in the design and implementation of measures that will have tangible impact on the economy. To this end, it is essential to consistently measure and evaluate key entrepreneurship indicators, as part of an integrated national system for monitoring and assessing the competitiveness of the economy.

Rest assured that the Government is committed to taking into consideration the results and policy recommendations of the 6th GEM report. We will focus mainly on the cultivation of entrepreneurial spirit, the modernisation of the existing educational system to create business-oriented mindsets at an early age, the promotion of e-government and the creation of synergies between academia and enterprises.

Natasa Pilides  
Minister of Energy, Commerce and Industry

# EXECUTIVE SUMMARY



While the COVID-19 pandemic demonstrated the value of entrepreneurship as a pathway for transforming crises into opportunities through the discovery of solutions, the post-pandemic era also stresses the importance of entrepreneurship as an avenue to economic recovery, growth and prosperity. Aiming to accelerate economic recovery in the post pandemic era, the Republic of Cyprus acknowledges the need to support entrepreneurial growth. To formulate the policies which will enable the further development of its scientific, entrepreneurial and innovation ecosystem, it is essential to draw on data-driven evidence on the island's entrepreneurial and innovation activity.

GEM is the leading study worldwide to provide data-driven evidence on entrepreneurial activity and ecosystem dynamics. The 2021/2022 is the 23<sup>rd</sup> consecutive GEM global study offering a body of evidence from over 150,000 individuals from

50 different economies, which in total represent approximately 68% of the global gross domestic product (GDP) and 45% of the population worldwide. This body of data adds to the stock of over three million individuals interviewed since the first GEM study. GEM's conceptual framework includes a set of indicators on entrepreneurship, allowing for the construction of detailed profiles of entrepreneurship in each participating country. These include societal attitudes and beliefs towards entrepreneurship, the demographics of entrepreneurs, the entrepreneurial status and expected impact of entrepreneurial activity in job positions and also the conditions of each country's entrepreneurial ecosystem. GEM's framework is well positioned to assess the status of entrepreneurial activity in each country. The availability of longitudinal data and the consistency in terms of definitions and methodology enable the analysis and comparison of the results across the years and across different economies. For instance, it is possible to

# 1

compare the level of entrepreneurial activity during and before the pandemic years, offering the opportunity to assess the impact of the COVID-19 pandemic on entrepreneurial activity.

Through its participation in the GEM consortium, Cyprus becomes part of the global map of entrepreneurship and innovation. This is the sixth consecutive year in which Cyprus participates in GEM. Following a structured and consistent methodology across the years which includes two surveys: the Adult Population Survey (APS) and the National Expert Survey (NES). In 2021/2022, more than 148,000 people completed the GEM APS, adding to the core GEM database of over three million APS respondents across 120 different economies since the first survey in 1999. This year's report draws on empirical data to shed light on how the second pandemic year affected entrepreneurship. Aiming to discuss the status of entrepreneurial indexes and ecosystem conditions in the mist of the pandemic, in this version, we compare the 2021/2022 results, with the results of the previous two years to reflect on the pandemic impact between the two years of the pandemic and between the pandemic and pre-pandemic years. Following up on earlier editions, we compare Cyprus' index rates with the corresponding European average rates. We also compare the results with Greece's and Luxembourg's, two countries employed as benchmarks for this report.

The APS results show that, in 2021/2022, the perceptions about entrepreneurship in Cyprus remained optimistic despite the pandemic circumstances. In particular, this year's results demonstrate notable improvement in terms of the perceived opportunities. Approximately one in two Cypriots perceives that there are good opportunities to start a business in their area, a significant increase from 2020/2021, when the corresponding index rate was only 21.1%. The population is also optimistic with regards to the ease of starting a business, as approximately one in two Cypriots consider it easy to start a business in Cyprus. Further, 64.1% of the survey responders believe that they have the necessary capabilities including knowledge, skills, and experiences to start a new business. This year's results also show that a clear majority of Cypriots (72.9%) personally know an entrepreneur. These index rates have increased compared to the previous two years indicating that the population in Cyprus is becoming more familiar with entrepreneurship.

Fear of failure was notably higher compared to the pre-pandemic years but did not increase further in the second year of the pandemic. In 2021/2022 approximately one in two Cypriots expressed fear of failure towards starting a new business, whereas in 2019/2020 the value of the fear of failure index in Cyprus was 36.4%. Total Early-Stage Entrepreneurial Activity (TEA) was also lower compared to the pre-pandemic survey (8.6% in 2021/2022 versus 12.2% in 2019/2020), but it showed a small improvement of 0.2% compared to 2020/2021, the first year of the pandemic. The improvement was markedly higher for the index value of established businesses (business that has paid salaries, wages, or has made other payments to the owners for more than 42 months), measured at 8.6% versus 7.3% in the previous year, indicating the start of a recovery for mature businesses.

The profile of Cypriot entrepreneurs remains stable. The majority of entrepreneurs are males in the 25–44 age range, while women have lower participation in entrepreneurial

activity. The ratio of female to male TEA involvement in Cyprus is 0.6. These results persist across all the years in which Cyprus participates in GEM.

The overall performance of entrepreneurial framework conditions in Cyprus is lower, compared to last year's results. In Cyprus, the commercial and legal infrastructure, the physical infrastructure, and the government policies with regards to taxes and bureaucracy are the key strengths of the local ecosystem. Despite these strengths, this year's report identifies several entrepreneurial conditions which act as burdens to entrepreneurial activity. The results show that entrepreneurial education in Cyprus is narrow and lacks an integrated approach covering school, tertiary and life-long education. Access to financial resources and government entrepreneurship programs are limited regardless of the stage of entrepreneurial activity. Research and development activities do not sufficiently support the collaboration between academia and industry in the light of research commercialization, whereas social and cultural norms are not sufficiently facilitating entrepreneurial development. These conditions are currently restricting the growth of entrepreneurial activity in Cyprus. Enhancing initiatives at national and local levels, incentivizing international investors, promoting industrial doctorates and elevating entrepreneurial education at all stages are some of the recommendations included in this report aiming towards a more robust entrepreneurial ecosystem.

The GEM Cyprus 2021/2022 report provides evidence-based policy recommendations to support entrepreneurs in developing robust and value-adding businesses. These recommendations are especially significant. Indeed, while businesses worldwide have started to recover from the COVID-19 pandemic, other global challenges such as social and economic inequality, climate change and pollution persist, and geopolitical volatility in our region has increased substantially. It is in this new and turbulent environment in which Cypriot entrepreneurs must recalibrate their business models and transform their business. In this report's special section, we showcase the ERATOSTHENES Centre of Excellence as an example of how Cyprus could pave the way to living up to new challenges, such as entering the space arena.

## GEM INTRODUCTION AND BACKGROUND



Global Entrepreneurship Monitor (GEM) is the biggest and longest-standing study of entrepreneurs and entrepreneurial approaches in the world. Over more than two decades ago, the Babson College (USA) and London Business School (UK) initiated this research project, aiming to measure and monitor levels of entrepreneurial activity across different countries. GEM has now become a research organization bearing a name and brand, universally recognized by several stakeholders including entrepreneurship academics, experts, and policymakers. GEM 2022 draws on comparisons between 50 economies that participated in this year's study, providing insights during the challenging and turbulent period of the COVID-19 pandemic. The GEM methodology facilitates the comparisons on entrepreneurial activity across different economies in a precise and specific way.

## 2.1 WHY IS CYPRUS' PARTICIPATION IN GEM IMPORTANT?

Starting and running new businesses is very important to any economy, including Cyprus', as new entrepreneurial endeavors are expected to contribute to the economy and society in terms of new job openings, increased income, added value, new ideas, technologies, products and procedures. Although not all new businesses grow and prosper, failure is also an important element of the entrepreneurial process, facilitating learning and growth for entrepreneurs. Thus, measuring the level of entrepreneurial activity is important as it can serve as an indicator for the status of the economy and its future projections.

Cyprus' participation in GEM enables benchmarks for every participating economy, allowing in this way the comparison between different economies. Along the same lines, GEM's consistency in the definition and measurement of the level of entrepreneurial activity also allows us to monitor the evolution of entrepreneurship across the years. This is particularly important given the turbulence of the last few years, arising by the most pervasive pandemic in living memory, which has impacted on the entrepreneurship indexes across the globe, including entrepreneurial intentions to create businesses, market opportunities and motives. Cyprus' participation in GEM provides evidence on entrepreneurial intentions and activity, as well as more detailed impacts on the use of technology in selling goods and services, or national expert views on the changing economy, among others.

While globally there is currently a shift towards recovery while the business environment diverts towards more positive outcomes, there will still be even newer opportunities for people to live and work differently. The GEM methodology allows Cyprus to account for the intention of individuals to start a new business, reflecting on the individual's drive, competence and motivation, while it sheds light on the social values and frameworks that may promote or hinder an entrepreneurial mindset such as risk-taking. GEM accounts for the interaction of personal characteristics and the entrepreneurial environment. The GEM Conceptual Framework, illustrated in Figure 2.1, accounts for such relationships, thus also providing insights on the potential socio-economic development associated with entrepreneurial activity.

GEM 2021/2022 included 50 economies. Following the approach of previous years, GEM clusters participating economies by income and by region. The income criteria employed are those indicated by the World Bank in terms

of Gross Domestic Product (GDP) per capita, modified by GEM's own income boundaries, in order to achieve a more even spread of participating economies, and hence more meaningful comparisons. Figure 2.2 illustrates all economies participating in this year's GEM as clustered by GEM, into three income levels:

- Level A: economies with a GDP per capita of more than \$40,000
- Level B: economies with a GDP per capita of between £20,000 and \$40,000
- Level C: economies with a GDP per capita of less than \$20,000.

## 2.2 HOW ARE GEM DATA COLLECTED?

GEM aims not only to provide a clear and consistent definition of entrepreneurship but also to develop the methodology by which entrepreneurship can be measured and assessed. National Teams are in charge of overseeing the collection of GEM data and of reporting results based on that national data set. Each GEM National Team is usually led by a top academic institution in the country, or another organization with vested interests and appropriate expertise in entrepreneurship. Cyprus' national participation in GEM is overseen by the University of Cyprus. The national team is in charge of collecting GEM data annually, coordinating with GEM Global and preparing and publishing our country-specific National GEM Report.

The GEM report includes two surveys: the Adult Population Survey (APS) and the National Expert Survey (NES). In 2021, more than 148,000 individuals completed the GEM APS interview, adding to the core GEM database of well over three million APS respondents across 120 different economies since the first surveys began in 1999. The APS examines the attitude and activity of around 2,000 adults between the ages of 18–64 in each participating economy and is implemented via face-to-face or telephone interviews. Following the GEM methodology, every economy employs an identical questionnaire (translated in the respective native languages). This enables both GEM and the participating economies to derive corresponding conclusions on entrepreneurship, including activity relevant to initiating or running a new or established business, and on entrepreneurs' attitudes and perceptions on entrepreneurship, while also looking at specific characteristics such as age, gender and education.

The APS is a survey that illustrates the attitudes, approaches and expectations of adult individuals, and as such it differs from businesses surveys and official government statistics like business registrations. Instead, APS data provide insights on one's decision to initiate or continue a new or established business and on the entrepreneurial journey from its initial step through its subsequent development. The consistency of these questions, and the way in which results are used to estimate key variables, enables comparisons between economies and over time. In 2021, the survey included specific COVID-related questions, including whether starting a business is more difficult than a year ago, and whether new businesses are expecting to use more digital technologies to sell their products. There are also multiple other ways that the APS can reveal impact. An example would be by facilitating comparisons of entrepreneurial activity between levels pre-pandemic (2019), in the early stages of the pandemic (2020), and in its more advanced stages (2021). Even then,

Figure 2.1: GEM Methodology

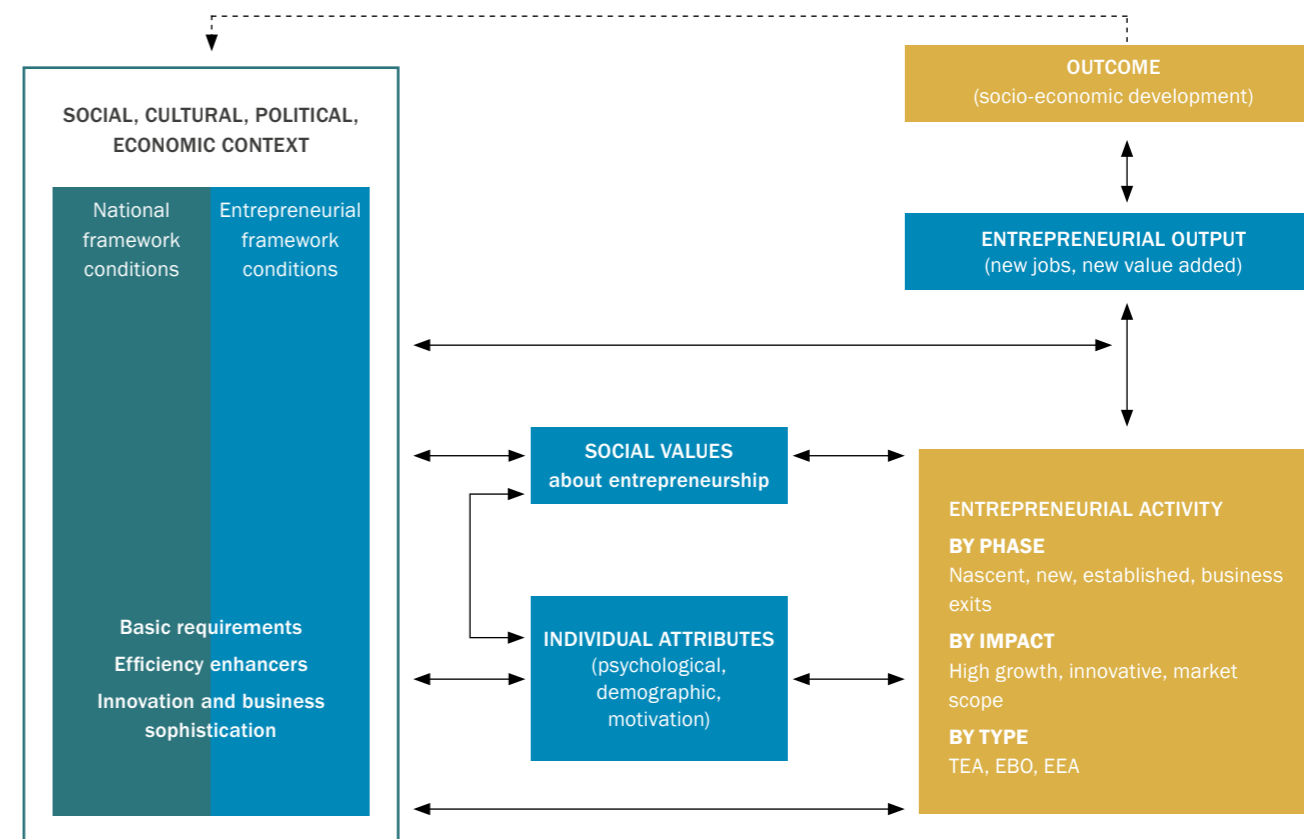
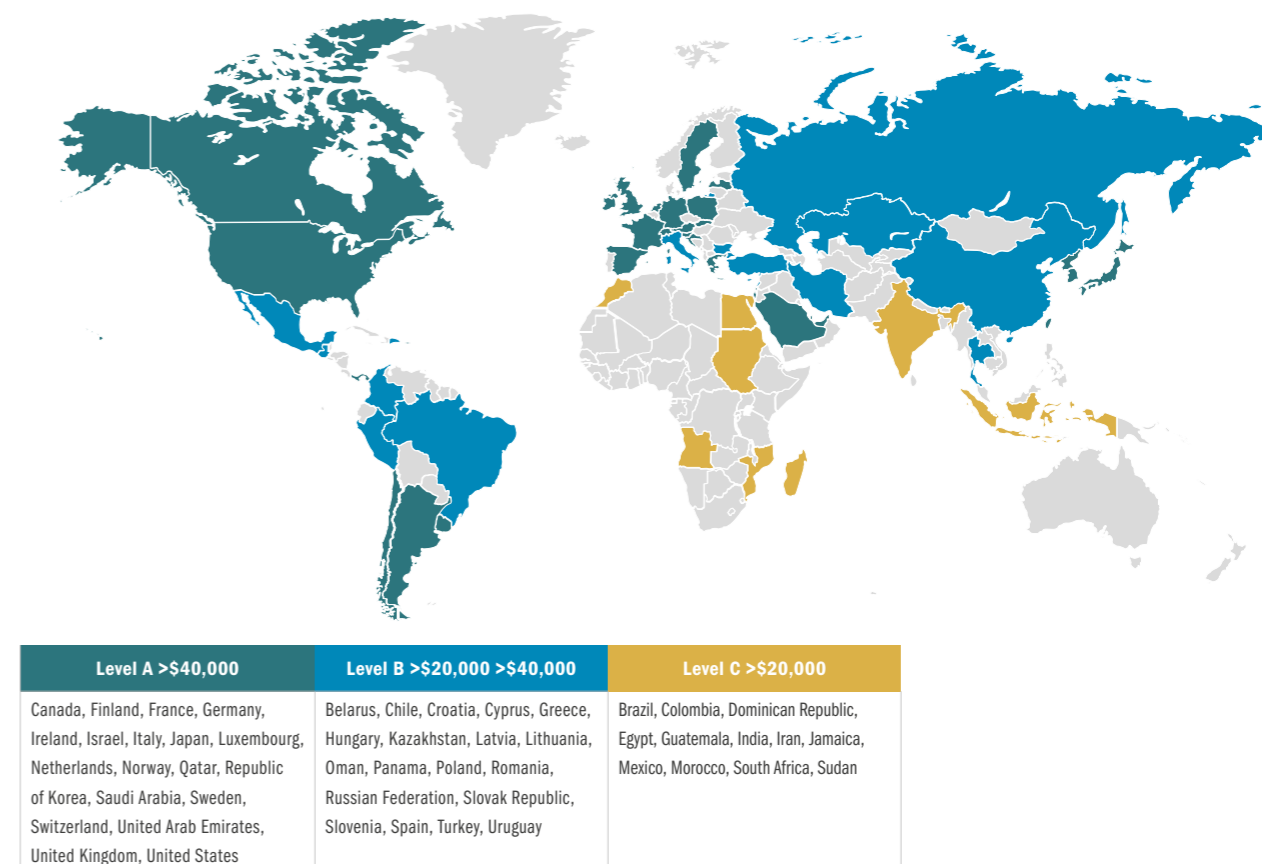


Figure 2.2: Economies participating in GEM 2021/2022





such comparisons must be treated with caution since, in the highly volatile spread of the pandemic, different economies may have been at different stages of the pandemic when the surveys were conducted. It is also important to bear in mind that, even under normal circumstances, GEM variables can in any case fluctuate year by year. Some of this variation may reflect structural change within economies. Figure 2.3 illustrates the GEM methodology on APS.

The second survey is the National Expert Survey (NES), which primarily focuses on the entrepreneurial environment that influences the decision to start a new business, as well as subsequent decisions such as how to sustain and grow that business. This can facilitate and nurture the new business with regards to finance, the populations' skills and education and also through social support of entrepreneurship; or it may prevent the new business from developing through bureaucracy and taxes, poor foundation and social isolation. For example, there are businesses initiating and developing their operations in weakly supported environments. However, there is no doubt that entrepreneurship has more potential to flourish in entrepreneurial environments that are more supportive.

The GEM approach is reflecting on each country's national environment for entrepreneurship. It mainly focuses and depends on expert evaluation of nine Entrepreneurial Framework Conditions. These range differently; from the competence of entrepreneurial education, to the opportunity and cost of vital business services and from the ease to access, to finance, to social support for entrepreneurship. Each of the said conditions is assessed by the NES, which focuses on identified national experts, and is conducted in a much more targeted manner than the APS. GEM methodology requires that at least 36 national experts participate in NES. The experts are asked to reflect on the nine entrepreneurial conditions of the ecosystem. In carrying out NES in 2021, new questions were added in order to capture the impact of working from home and the rise of the gig economy.

Taken together, the APS and the NES surveys provide an accurate, comprehensive, current picture of entrepreneurship in each participating economy. GEM's Conceptual Framework is illustrated in Figure 2.2, showing the connection between entrepreneurship and its national and regional environment. Entrepreneurship is influenced both directly and indirectly by economic, social and cultural reasons, which impact individual values. For that reason, while the NES requests a small team of experts to examine the entrepreneurial ecosystem or environment, the APS requires a large representative sample of the adult population in order to assess the individual's attitudes and beliefs, such as whether it is easy to start a business, whether there are good business opportunities, and whether fear of failure constitutes an obstacle. Other APS questions focus on whether that person initiates a new business or is running an already established business, as well as whether the individual is doing so on behalf of their employer, and what their motivations and ambitions are. In this regard, the APS covers all levels of the entrepreneurial process, as it examines a wide range of individuals, from those who have the intentions to start a business, to those actively starting but not yet trading (nascent entrepreneurs), to those running a new business (new business owners), as well as to those owning and running an already established business. Indicatively, regarding entrepreneurial activity, GEM

captures data using indicators which describe the life cycle of a venture, including:

**Total Early-stage Entrepreneurial Activity – TEA:** Percentage of the adult population between 18 and 64 years, who are in the process of starting a business (nascent entrepreneurs) or are owner-managers of a business younger than 42 months' old.

**Established business ownership rate:** Percentage of the adult population between 18 and 64 years, who are currently owner-managers of an established business, i.e., owning and managing a running business that has paid salaries, wages, or has made other payments to the owners for more than 42 months.

**Business discontinuation rate:** Percentage of the adult population aged between 18 and 64 years (either nascent entrepreneurs or owner-managers of a new business) who have, in the past 12 months, discontinued a business, either by selling, shutting down, or otherwise discontinuing an owner/management relationship with the business.

**Entrepreneurial Employee Activity – EEA:** Percentage of the adult population aged between 18 and 64 years who, as employees, have been involved in entrepreneurial activities such as developing or launching new goods or services, or setting up a new business unit, a new establishment or a subsidiary.

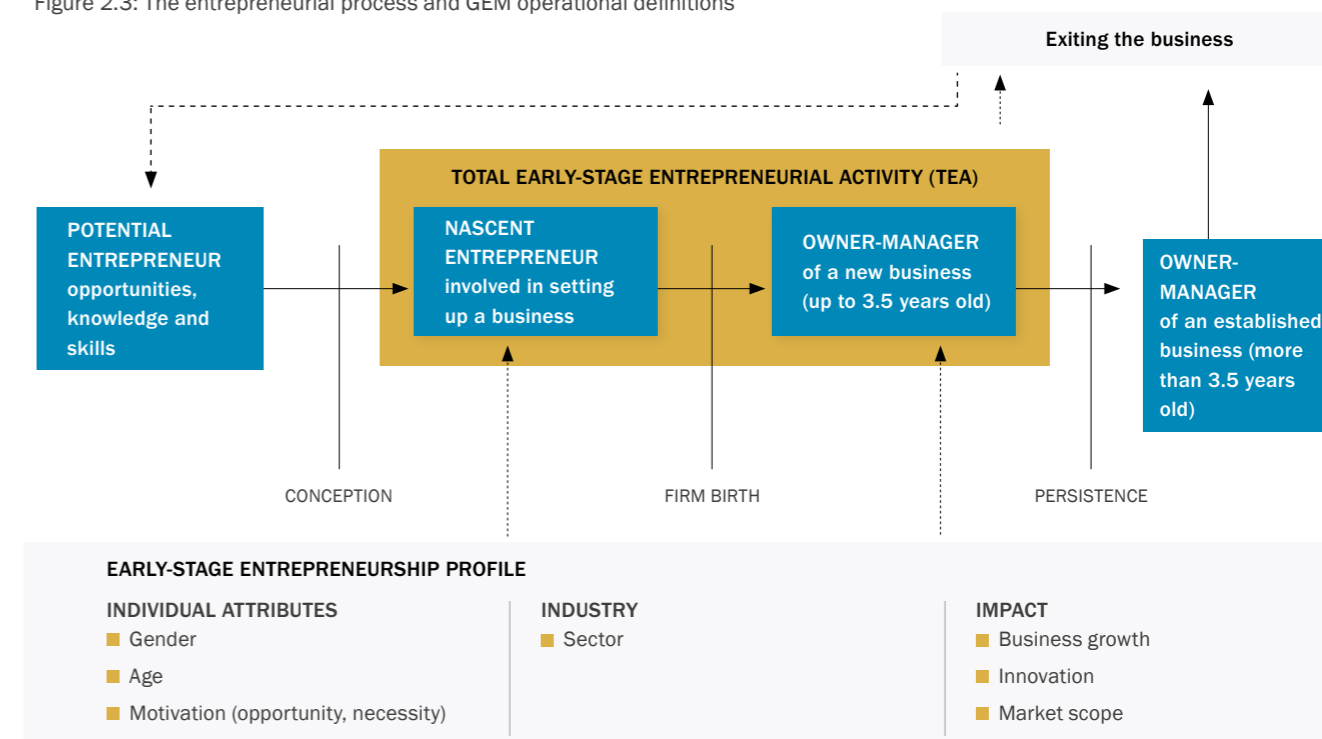
Beyond entrepreneurial activity, through the NES, GEM examines the entrepreneurial ecosystems, and more particularly the entrepreneurial framework conditions. These include the following components:

- Entrepreneurial financing
- Government policies: support and relevance
- Government policies regarding taxes and bureaucracy
- Government entrepreneurship programs
- Entrepreneurship education at primary and secondary school stage
- Entrepreneurship education at post-school stage and entrepreneurship training
- Research & Development (R&D) transfer
- Commercial and legal infrastructure
- Internal market dynamics
- Internal market burdens or entry regulations
- Physical infrastructure
- Cultural and social norms

The quality of the dimensions of the entrepreneurial framework is based on the average value of experts' perceptions, using a Likert scale ranging from 1 (highly insufficient) to 9 (highly sufficient).

Figure 2.3 sets out the GEM entrepreneurship indicators, according to the stages involved as the enterprise progresses, from conception to an established business. A key GEM indicator of entrepreneurial activity is the level of Total early-stage Entrepreneurial Activity (TEA), or the percentage of adults who are either actively engaged in starting a new business (nascent entrepreneurs), or owning and managing a new business (new business owners). Another important indicator is the level of Established Business ownership (EB), or the percentage of adults owning and managing an established business, defined above as having paid wages or salaries for 42 months or more.

Figure 2.3: The entrepreneurial process and GEM operational definitions



If the new business is successful, then it will evolve over time to become an Established Business (EB). Either the new business owner or the established business owner may exit the business at some stage, and that business may or may not continue without them. Moreover, former business owners are an important resource, as they can share their experiences by mentoring other entrepreneurs and/or can start another business.

GEM's methodology contains a set of basic entrepreneurship indicators which define the ranking for each participating country. Overall, this group of indicators may be regarded as a dashboard representing a broad and completed set of measures that collectively provide towards the impact entrepreneurship has on a society and the amount at which each society supports this activity.

## THE GEM METHODOLOGY IDENTIFIES THREE CATEGORIES OF INDICATORS, AS FOLLOWS:

### Societal values and perceptions:

**Good career choice:** Percentage of the adult population (18-64 years' old) who are of the belief that entrepreneurship is a good career choice.

**High status to successful entrepreneurs:** Percentage of the adult population (18-64 years' old) who believe that high status is afforded to successful entrepreneurs.

**Media attention for entrepreneurship:** Percentage of the adult population (18-64 years' old) who believe that there is a lot of positive media attention on entrepreneurship in their country.

### Individual attributes of a potential entrepreneur:

**Perceived opportunities:** Percentage of the adult population (18-64 years' old) who believe there is good potential and visible opportunities to start a firm in the area where they live.

**Perceived capabilities:** Percentage of the adult population (18-64 years' old) who believe they have the required skills and knowledge to start a business.

**Entrepreneurial intention:** Percentage of the adult population (18-64 years' old) (excluding individuals involved at any stage of

the entrepreneurial activity) who are latent entrepreneurs and who intend to start a business within three years.

**Fear of failure rate:** Percentage of the adult population (18-64 years' old) who indicate that fear of failure would prevent them from setting up a business.

### Entrepreneurial activity indicators:

**Nascent entrepreneurs:** Those who have taken steps to start a new business, but have not yet paid salaries or wages for more than three months.

**New entrepreneurs:** Those who are running new businesses that have been in operation for between 3-42 months.

The following sections report on the results of the GEM Cyprus' 2021/2022. Where possible, the results of earlier years are also presented for comparison purposes, whereas the analysis also compares Cyprus' entrepreneurial indexes to the corresponding index values of Greece and Luxembourg. The choice of the two countries was made due to cultural and geographical proximity reasons (Greece) and population size similarity (Luxembourg), in keeping up with the approach employed in the previous years. Where possible, the analysis also draws on the average rates of other European countries and uses those values as benchmark rates.

# ENTREPRENEURIAL ACTIVITY IN CYPRUS IN 2021/2022



# 3

Cyprus has been part of GEM Global since 2016. This Section reports on the results of this year's APS, drawing on the data collected through the GEM methodology. Where possible, the results are compared across the years and with other countries as discussed in Section 2.

Since the rise of the pandemic in 2020, the GEM methodology contains questions associated with the impacts of COVID-19 pandemic, including how it has affected household incomes. Responses have been based on a 5-point Likert scale ranging from Strong decrease to Strong increase of household income. Figure 3.1 summarizes the findings in Cyprus as well as other

selected economies regarding the past two years. Compared to last year's results with regards to household income, in 2021/2022, the percentage of Cypriots who have experienced a strong decrease has gone down by 3.4% to 13.7%, whereas the percentage of those who have experienced an increase has risen by 2.5%, to 3.7%. Moreover, for 27.1%, their income decreased somewhat, while 55.4% of the population indicated no substantial change. The corresponding European average value for those experiencing a strong decrease is lower compared to Cyprus' (11.5%) and similar to those experiencing a somewhat decrease (22.2%) or even somewhat increase (7.5%). Compared to Cyprus, a smaller number of

residents of Luxembourg have seen negative changes in their household income, whereas the vast majority reported that their household income was not affected (71.9%). Compared to last year's results, about 3.9% of the population in Europe has seen an increase (somewhat increase or strong increase) in their household income due to the pandemic, highlighting that the pandemic also brought opportunities for a part of the population and that these opportunities increased compared to the first year of the pandemic.

### 3.1 SOCIETAL VALUES & PERCEPTIONS ON ENTREPRENEURSHIP

Some of the most important indexes of the GEM methodology measure societal values and perceptions toward entrepreneurship. These indexes provide indications of the entrepreneurial environment as well as of the values and perceptions which shape entrepreneurial intentions.

Perceptions of the population on entrepreneurial opportunities in Cyprus improved in 2021/2022 as 50.2% of the population considers that there are good opportunities to start a business in their area (Figure 3.2), compared to a mere 21.1% in 2020/2021. This improvement is reflected across countries employed as benchmarks. In Greece, 48.6% of the population believes that there are opportunities (27.9% last year), whereas the corresponding value in Luxembourg is 54.1% (up from 41.9% last year). The European average value on this index has also risen to 51.1% this year, compared to 39.5% last year. The overall improvement in perceived opportunities possibly signals that in the second year of the COVID-19 pandemic, the population was more optimistic in transforming the pandemic challenges into entrepreneurial opportunities as vaccines became available. Along the same lines, a larger proportion of Cypriots became more optimistic by 29.1% compared to last year.

Along the same lines, GEM reflects on the perceived ease of starting a business in each country. In Cyprus, that perception has slightly improved compared to last year's results. Comparing the results with 2019/2020, the overall perception on the ease of starting a business in Cyprus has improved by 12.7%. As of 2021/2022, approximately one in two Cypriots perceive that it is easy to start a business in Cyprus. As illustrated in Figure 3.3, the index value in Cyprus is aligned with the European average rate, is higher compared to Greece's (35.1%) and lower compared to Luxembourg's (64.1%).

Beyond being more optimistic with regards to the entrepreneurial opportunities in Cyprus, the population is also more optimistic with regards to its capabilities to start a new business. These capabilities include knowledge, skills, and experiences to start a new business. As illustrated in Figure 3.4, in 2021/2022, 64.1% of the population in Cyprus perceives that they have the necessary capabilities for starting a business whereas the corresponding value last year was 58.1%. Cyprus' index value on perceived capabilities is higher compared to Greece's (53.1%) and Luxembourg's (52.9%) as well as the European average index value (49.8%). Optimism on capabilities to initiate new business ventures in Cyprus has been consistent across the years, which possibly connects with the fact that Cyprus is the second-highest country in tertiary educational attainment rate in the EU<sup>1</sup>.

As illustrated in Figure 3.5, fear of failure in Cyprus has increased during the pandemic years. In 2021/2022 approximately one in two Cypriots identify fear of failure as associated with starting a new business. This value is close to last year's result (49.1%), while in 2019/2020 only 36.4% of the population denoted fear of failure, signaling that the pandemic and its implications to the economy have possibly affected that perception. Cyprus' result is higher compared to the EU (44.3%) and to Luxembourg's index value (43%).

As illustrated in Figure 3.6, in 2021/2022, 72.9% of the population in Cyprus have noted that they personally know an entrepreneur. This index rate has increased across the years as last year, 68.1% of the population noted that they know somebody who has initiated entrepreneurial activity, whereas in 2019/2020, 56% of the population knew an entrepreneur. This index value is higher compared to the corresponding indexes of other countries used as benchmark (32.5% in Greece, 43% in Luxembourg). Cyprus' index value is also notably higher compared to the European average rate (50.9%). The EU average value has remained relatively unchanged across the years.

### 3.2 ENTREPRENEURIAL ACTIVITY

Beyond attitudes and perceptions, the GEM methodology also provides insights on actual entrepreneurial activity and its potential implications on economy and society. The Adult Population Survey (APS) study clusters entrepreneurial activity in three categories (cf. Section 2):

- Total early-stage Entrepreneurial Activity (TEA): Entrepreneurs starting or running a new business measured as a percentage of the adult population (% adults)
- Established Business Ownership (EBO): Entrepreneurs running an established business (% adults)
- Entrepreneurial Employee Activity (EEA): Entrepreneurs starting or running a business in the frame of their employer (% adults)

#### 3.2.1 Total early-stage Entrepreneurial Activity (TEA)

The Total Early-Stage Entrepreneurial Activity (TEA) index provides insights on new entrepreneurial activity. This index is valuable as it provides indications on entrepreneurial activity with growth potential. TEA index encapsulates two sub-categories of entrepreneurs: nascent entrepreneurs and new business owners.

Cyprus' TEA index remained relatively unchanged compared to the previous year (8.4% in 2021/2022, 8.6% in 2020/2021) (Figure 3.7). However, the same index rate was notably reduced compared to the pre-pandemic rate (12.2%). These results indicate that TEA entrepreneurs were largely impacted in 2020/2021 since entrepreneurial activity was reduced at the beginning of the COVID-19 pandemic, before it was stabilized in the second year of the pandemic. Cyprus' TEA index value is aligned with the EU average TEA value and is higher compared to Greece's (5.5%) and Luxembourg's (7.3%). Similarly to Cyprus, the EU-average rate was reduced at the beginning of the pandemic. Comparing Cyprus' TEA index value to countries outside the European geographical area, but in close geographical proximity Israel's TEA value is 9.6%. Figure 3.8 provides information on the TEA index rates of countries included in the European regional area and beyond.

Figure 3.1: Perceived impact of the pandemic on household income (% adults)

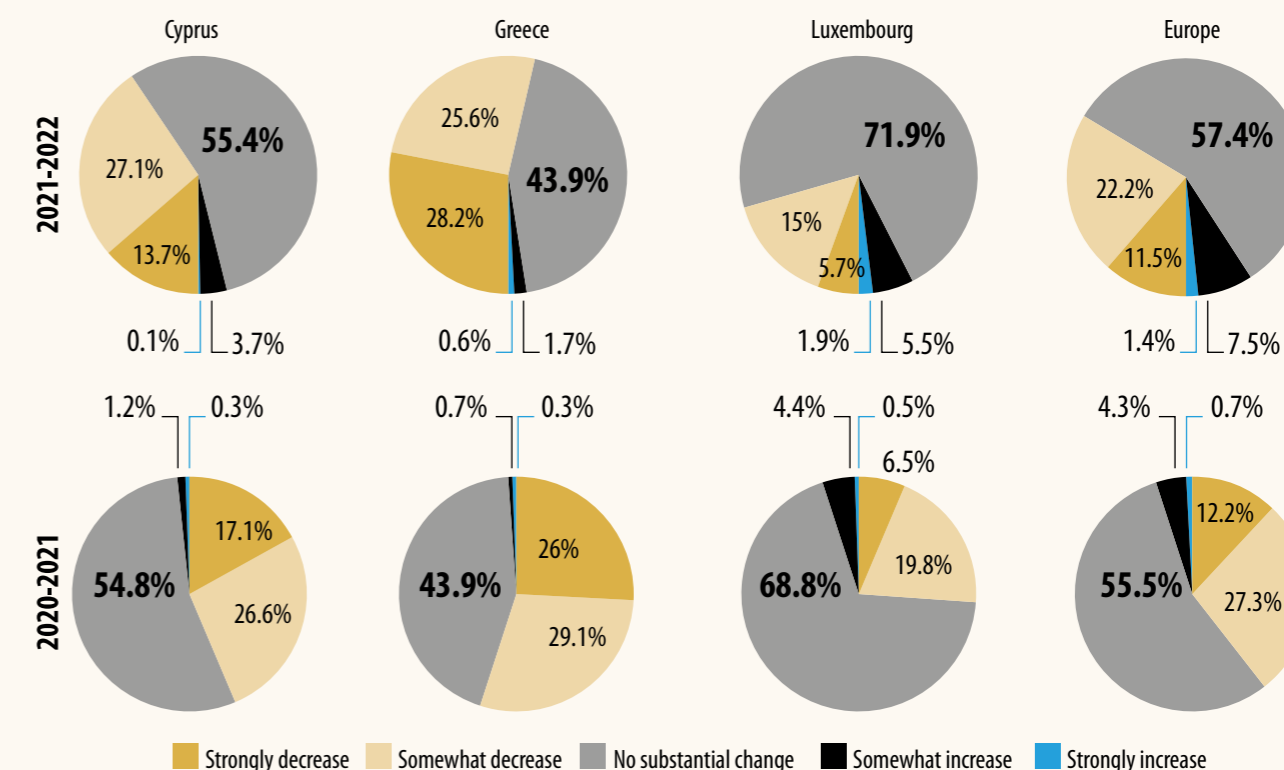


Figure 3.2: Perceived Opportunities: There are good opportunities to start a new business in my area (% adults)

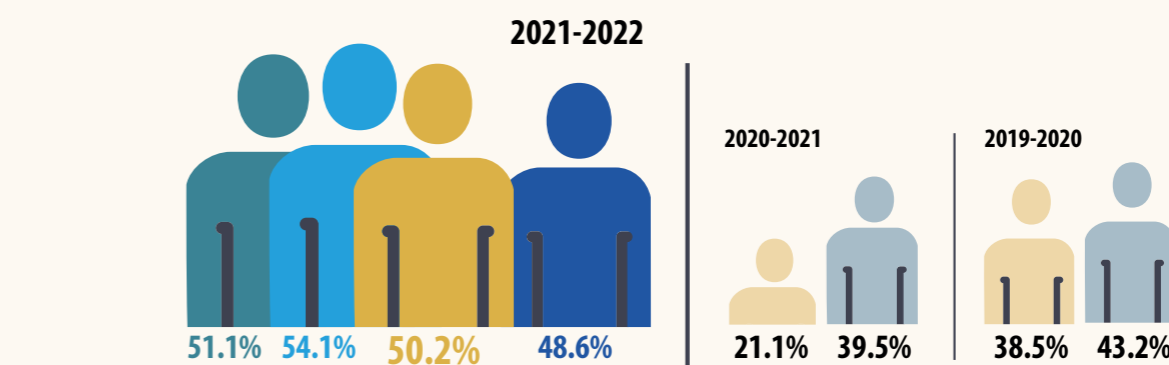


Figure 3.3: Perceived Ease: It is easy to start a business in my country (% adults)

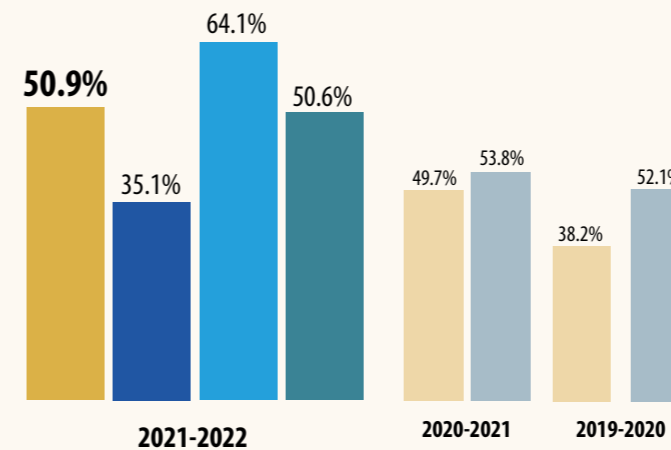
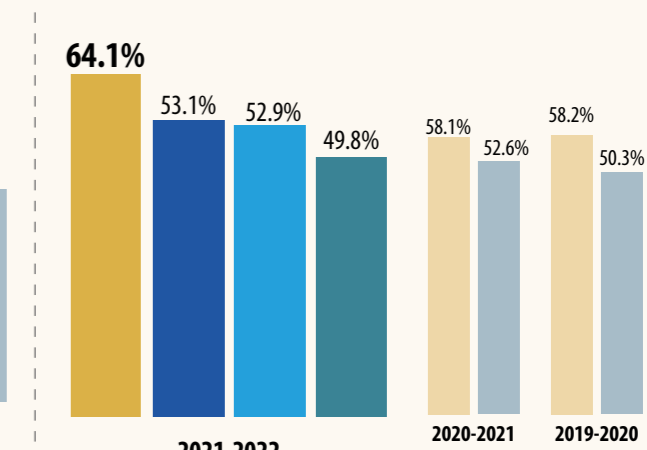


Figure 3.4: Perceived capabilities: You personally have the knowledge, skills and experience to start a new business (% adults)



1 [https://education.ec.europa.eu/sites/default/files/document-library-docs/et-monitor-report-2019-cyprus\\_en.pdf](https://education.ec.europa.eu/sites/default/files/document-library-docs/et-monitor-report-2019-cyprus_en.pdf)

Figure 3.5: Fear of Failure: would not start a business for fear of failure (% adults)

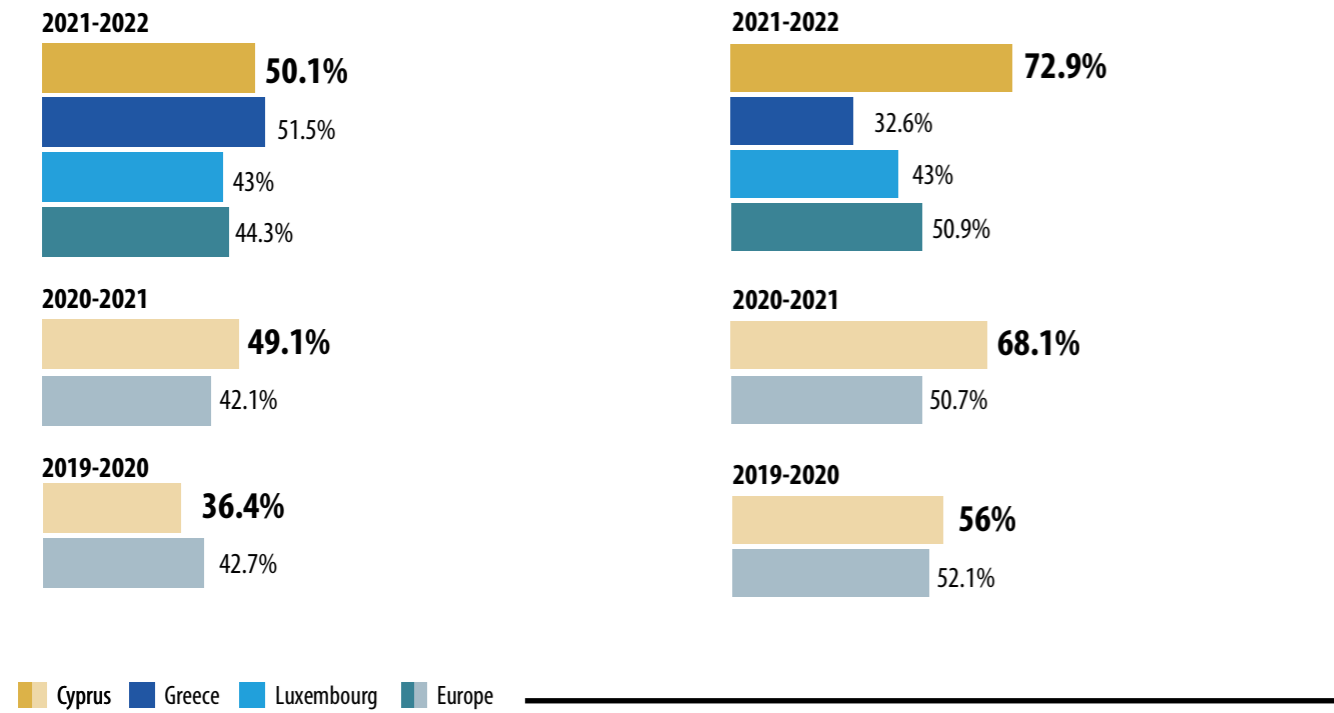


Figure 3.6: Personally know an entrepreneur (% adults)

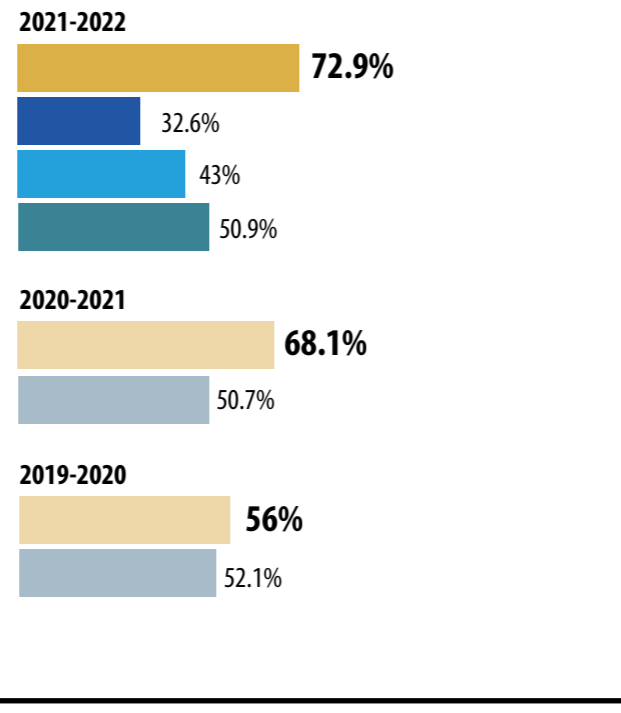


Figure 3.8: Cross-Country Comparison Total early-stage Entrepreneurial Activity (TEA)

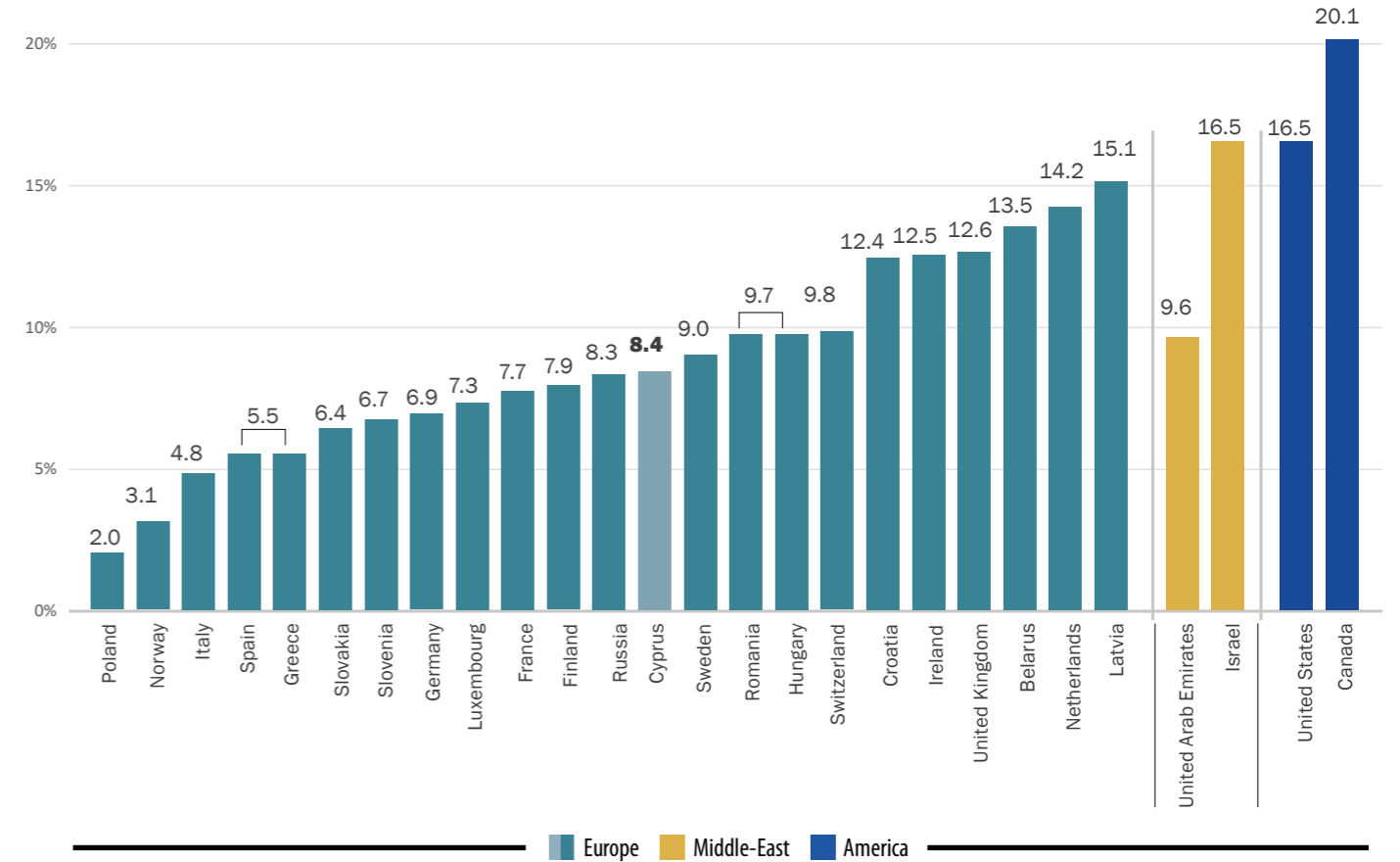
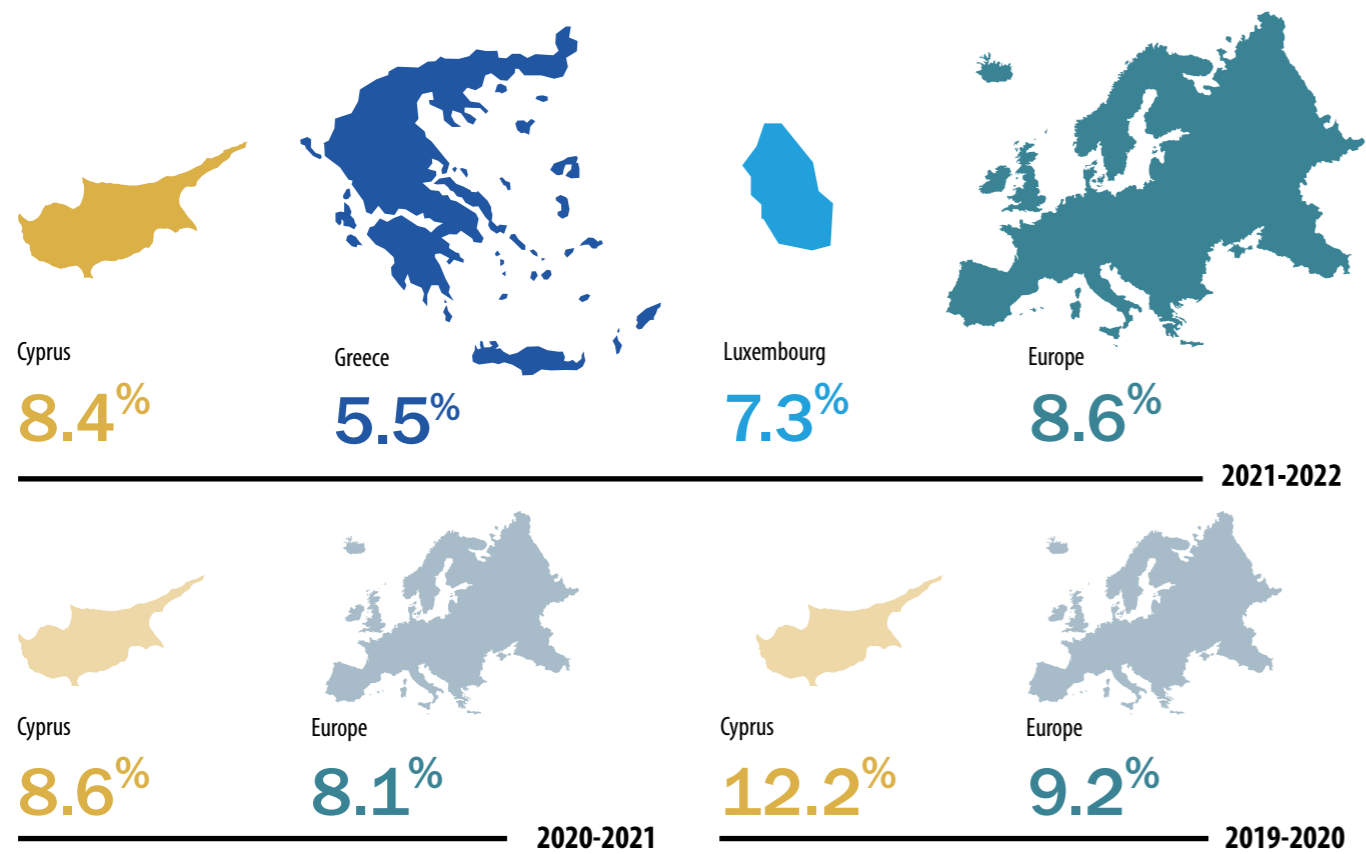


Figure 3.7: TEA index rates (% adults)



### Nascent entrepreneurs

Nascent entrepreneurship in Cyprus remained relatively unchanged compared to the previous year (5%, down by 0.1%). However, compared to the pre-pandemic year, nascent entrepreneurship has been reduced by 2.9%. This is also reflected in the values of Cyprus' TEA levels before and during the pandemic. As illustrated in Figure 3.9, Cyprus' nascent entrepreneurship is higher compared to Greece's (3.2%) and lower compared to Luxembourg's (5.5%). Compared to the European average rate, Cyprus' nascent entrepreneurship is slightly lower (5.4% in Europe). While this year's EU average value on nascent entrepreneurship has nearly recovered to the pre-pandemic value, Cyprus' rate did not indicate any signs of recovery.

### New business owners

Similarly to nascent entrepreneurship, new business ownership (Figure 3.10) in Cyprus in 2021/2022 remained almost unchanged, despite its 0.9% reduction compared to the pre-pandemic era (3.7%, down from 4.6%). These results are also reflected in Cyprus TEA index rate. Cyprus' new business ownership is higher compared to Greece's (2.4%) and Luxembourg's (2.43%). Compared to the European average rate (3.4%), Cyprus' new business ownership rate is slightly higher. Overall, the results demonstrate that both nascent entrepreneurship and new business ownership rates in Cyprus have been stable during the pandemic years, with no signs of recovery so far.

### 3.2.2 ESTABLISHED BUSINESS OWNERS

GEM also accounts for established business ownership rate. This year's results show that established entrepreneurship in Cyprus demonstrates signs of recovery from the global pandemic. Established business ownership rate in Cyprus was 10.1% in 2019/2020, before dropping to 7.3% in 2020/2021 and rising to 8.6% this year. As illustrated in Figure 3.11, Cyprus' established business ownership rate is higher than the European average rate (6.6%); in fact, it has been consistently higher to the European average rate across the years. Cyprus' established business ownership rate is higher compared to Luxembourg's (3.6%) and lower compared to Greece's (14.7%). Compared to other countries beyond the European regional area, Cyprus' established business ownership rate is higher compared to Israel's. Figure 3.12 provides more information on established business ownership rates.

### 3.2.3 EMPLOYEE ENTREPRENEURIAL ACTIVITY

GEM also measures entrepreneurial activity in terms of the employee entrepreneurial activity conducted within existing businesses. In 2020/2021, Cyprus employee entrepreneurial activity rate has been 6.0%. Compared to the previous year, there has been a slight reduction (0.2%). Such results indicate that the pandemic had a minor impact on employee entrepreneurial activity in businesses in Cyprus. As illustrated in Figure 3.13, Cyprus' rate is higher compared to the European average rate (3.8%) and compared to the corresponding index values of Greece (1.2%) and Luxembourg (4.3%).

Figure 3.9: Nascent Entrepreneurs in Cyprus and Europe

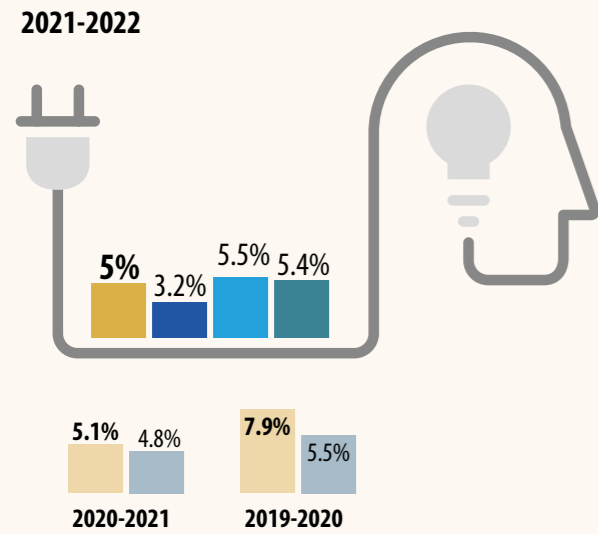


Figure 3.10: New business owners

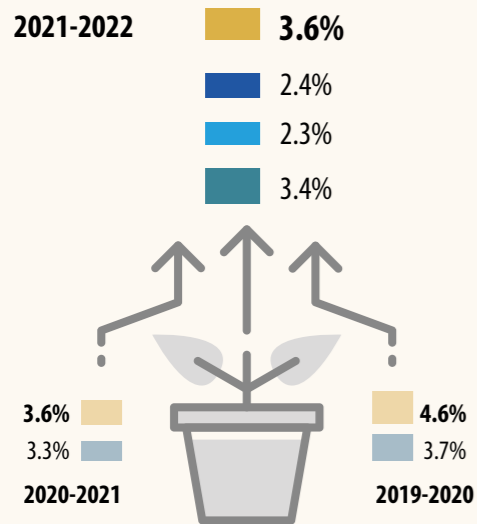


Figure 3.11: Established business ownership

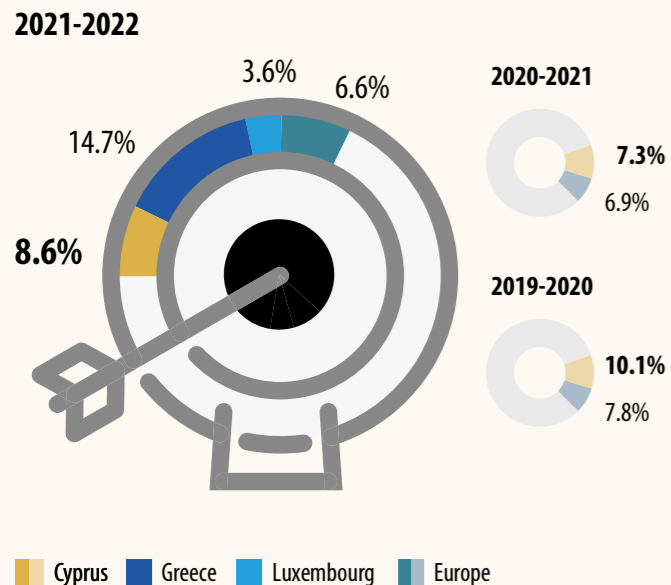
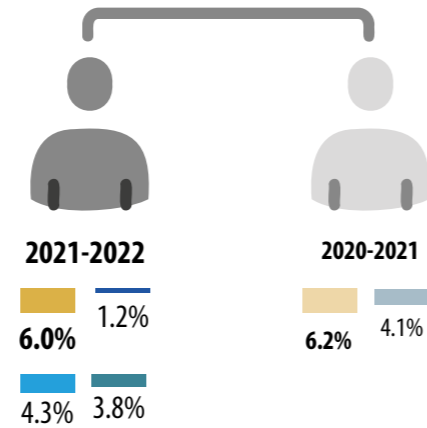


Figure 3.13: Employee entrepreneurial activity in Cyprus and Europe



### 3.3 PROFILE OF ENTREPRENEURS IN CYPRUS

Beyond entrepreneurial perceptions, intentions and actual activity, the GEM methodology also provides insights on the profiles of entrepreneurs in each participating economy. These results are useful for understanding the association of age, gender and education levels to entrepreneurial activity.

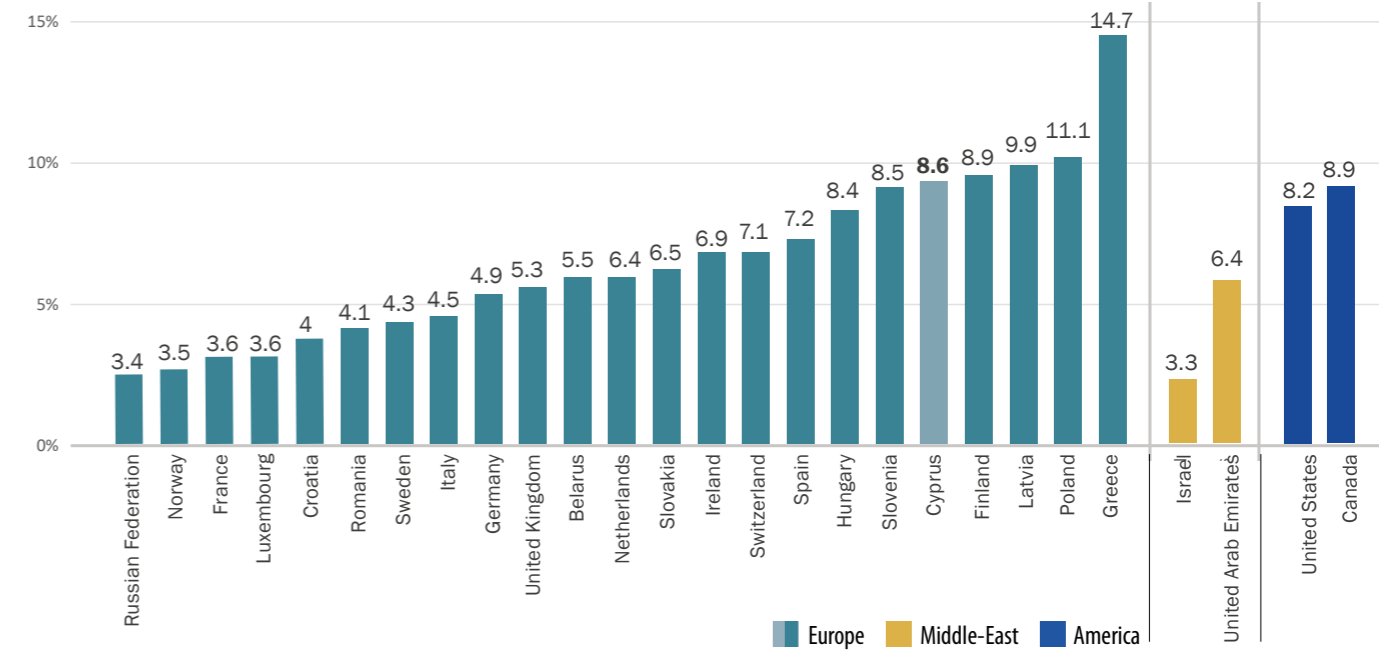
#### Age distribution

The most active age group in TEA is the 25-34 age cohort, followed by the 35-44 age cohort. These age groups have consistently been the most active across the previous years. In particular, 33.3% of TEA belongs to the 25-34 age cohort and 29.5% belongs to the 35-44 age cohort in Cyprus. The 45-54 age cohort is also notably active in TEA, with 20.9% of TEA associated with that age group. As illustrated in Figure 3.14, the ranking of Cyprus's results on TEA activity and age cohort are aligned with the results of other benchmark countries as well as the EU average. The low involvement of the 18-24 age cohort in TEA in Cyprus is possibly associated with the military or education commitments of this age group.

Figure 3.14: Total early-stage Entrepreneurial Activity (TEA) by age group (% of TEA in each age group) 2020/2021

	Cyprus	Greece	Luxembourg	Europe
18-24 years	7.1%	21.8%	18%	12.8%
25-34 years	33.3%	27.8%	29.7%	29.6%
35-44 years	29.5%	24.4%	27.7%	27.7%
45-54 years	20.9%	16.7%	20.1%	19.2%
55-64 years	9.1%	9.3%	4.4%	10.7%

Figure 3.12: Cross-Country Comparison Established Business Ownership (EBO) (both % of adults aged 18-64)



#### Gender distribution

The GEM methodology also draws on the demographics of TEA activity with regards to gender. Males in Cyprus are consistently across the years more active in TEA compared to females. The ratio of females to males involved in TEA in Cyprus (Figure 3.15) has been 0.6 and this value has remained unchanged, since the first participation of Cyprus in GEM in 2016. Similarly to 2020/2021, in Cyprus, 10.8% of the adult male population and 6.1% of the female population are active in TEA. Cyprus' ratio of female to male involvement in TEA is aligned with the European average ratio, whereas Luxembourg's ratio is lower (0.5) and Greece's ratio is higher (0.7), highlighting that females in Greece are more active in TEA compared to females in Cyprus. These results signal the potential for enhancing the participation of Cypriot females in TEA through further policies which can potentially support women in pursuing entrepreneurial career journeys.

Figure 3.15: Total Early-Stage Entrepreneurial Activity (TEA) rates and gender

	Cyprus	Greece	Luxembourg	Europe
Male TEA (% of adult male population)	10.8%	6.5%	9.3%	10.2%
Female TEA (% of adult female population)	6.1%	4.6%	5.1%	7.2%
<b>Ratio of female/male TEA</b>	<b>0.6</b>	<b>0.7</b>	<b>0.5</b>	<b>0.7</b>

	Cyprus	Greece	Luxembourg	Europe
Male TEA (% of adult male population)	11.0%	10.6%	10.9%	10.1%
Female TEA (% of adult female population)	6.1%	6.7%	4.9%	6.2%
<b>Ratio of female/male TEA</b>	<b>0.6</b>	<b>0.6</b>	<b>0.5</b>	<b>0.6</b>

#### Education

It is difficult to make direct comparisons on the level of education across economies and thus to comment on the relationship between education and propensity to initiate entrepreneurial endeavors in different economies participating in GEM. However, there are indications that individuals who received graduate tertiary education are more likely to pursue entrepreneurial endeavors. One approach to make observations on the relationship between education and TEA level, is to reflect on the respondents who have received at least a post-secondary degree (TEA graduates) or not (TEA non-graduates). This year's results show that in Cyprus, 9.7% of TEA are graduates, whereas 5.7% of TEA are non-graduates, demonstrating that education is possibly associated with the level of entrepreneurial activity in Cyprus, although a notable proportion of TEA are non-graduates. In Europe, 10% of TEA are graduates and 7.1% of TEA are non-graduates, also confirming the association of education level to TEA involvement (Figure 3.16).

Figure 3.16: % Total early-stage Entrepreneurial Activity (TEA) who are graduates and non-graduates

2020/2021				
	Cyprus	Greece	Luxembourg	Europe
% TEA non-graduates	6.7%	5.4%	3.0%	7.1%
% TEA graduates	9.7%	5.7%	9.6%	10.0%

### 3.4 ENTREPRENEURSHIP & IMPACT

The GEM methodology also invites respondents to reflect on the expected impact of their entrepreneurial endeavors. These may be associated with expected job openings, impact on a specific sector of the economy or even on the target audience orientation of the enterprises. These aspirations associated with TEA activity can serve as indicators for the expected impact of TEA on the entrepreneurial ecosystem as well as on economic growth and social progress. This section reports on the potential impact of entrepreneurial activity.

#### Sectors

The choice of sector for the new startup is an important one, with implications not just for that business but for the wider economy. The GEM APS asks those starting or running a new business to declare what sector that business is in, and classifies responses into four broad sectors: Extractive, including oil and gas, mining and agriculture; Transforming, including manufacturing and transport; Business Services, including communications and professional services; and Consumer Services, including hotels and restaurants, retailing and personal services. Regarding sector of TEA activity, most of the Cyprus' TEA is relevant to consumer-oriented services as more than one in two TEA entrepreneurs associate their activity with this sector. Cyprus' TEA involvement in the Transforming sector is 21.5% whereas business-oriented services account for 16.7% of TEA. In the same vein, consumer-oriented services is the leading sector in Greece and most of the EU countries. In contrast, Luxembourg's TEA activity is more targeted towards business-oriented services compared to Cyprus'. Cyprus' TEA associated with business-oriented services is notably lower compared to the EU average value (Figure 3.17).

#### Job creation

Ambition in new entrepreneurial endeavors is important. GEM APS asks those starting or running a new business how many people they expect to employ in five years' time. Figure 3.18 illustrates the job growth expectations of those starting or running a new business in the next five years. These include those who are expecting zero new job openings, those expecting one to five job openings and those expecting six or more job openings. In Cyprus, 4.5% of the adult population expects to employ one to five additional employees in the next five years, 3.1% expect no new job positions whereas

0.8% expect six or more new job openings as a result of their entrepreneurial activity in the next five years. Most of the entrepreneurs in Greece, Luxembourg and other EU countries also expect one to five new job openings associated with their entrepreneurial activity. However, compared to Cypriots, they seem more optimistic in having more than six new job openings (indicatively, the EU average (1.8%) more than doubles the Cyprus average)).

#### Innovation

Entrepreneurs have expectations on the innovativeness of their product and the extent to which it is new to their target audience and beyond. The GEM APS asks those starting or running a new business whether any of their products or services are new to people in the area where they live, or new to people in their country, or new to the world. In Cyprus, only 2.4% of the population starting a new business considers their product or service new, of which 1.3% considers their product new to their local audience and 1.1% new to their national audience. Compared to Greece, Cyprus has a higher overall rate of innovativeness as in Greece, 1.8% of the population considers their product or service new at local, national or international levels. However, Cyprus has lower product or service innovativeness compared to Luxembourg's 3.9% rate (of which 0.9% considers their product or service new to the international community). As illustrated in Figure 3.19, in Europe, 2.6% considers their product or service new to local, national or international audiences. Along the same lines, GEM also enquires the population on their target audience orientation, aiming to retrieve insights on the extent to which adults starting or running a new business can anticipate 25% or more revenue from outside their country. In Cyprus 1.2% of the population anticipates international orientation, which is close to the European average rate (1.3%). The proportion of the population of Greece and Luxembourg that targets international customers is also slightly higher compared to Cyprus, as the corresponding rate values are 1.4% and 1.7% respectively.

#### Innovativeness and Technology

The GEM APS also measures the proportion of adults starting or running a new business using technology or processes that are either new to their area, new to their country or new to the world. As reported in Figure 3.21, in Cyprus 2% considers the technology or process used as new to their area, 1% as new to their country and only 0.1% as new to the world. In Europe, 1.1% of EU population considers the technology or process as new to their area, 0.8% as new to their country and 0.4% as new to the world. Compared to Greece and Luxembourg, a larger proportion of the population in Cyprus considers the technology or processes used as new to their area or country. However, 1% of the population of Luxembourg considers the technology or processes used as new to the world, which is higher compared to the corresponding rate in Cyprus.

#### Business exits

Business exits may be associated with a plethora of reasons, positive or negative. The most usual negative reason is insufficient sales or profitability, whereas other negative reasons may include the burden of taxation or bureaucracy, the failure to access resources, including finance, or some change in personal circumstances. Beyond these reasons,

Figure 3.17: TEA Activity & sector (all % of TEA)

TEA Activity & Sector				
	Cyprus	Greece	Luxembourg	Europe
Business-oriented services	16.7%	17.3%	43.8%	3.3%
Consumer-oriented services	58.6%	42.7%	35.7%	2.7%
Extractive sector	3.2%	12.4%	2.7%	17.8%
Transforming sector	27.1%	44.2%	6.1%	22.6%

Figure 3.18: Job growth expectations: Total early-stage entrepreneurs (TEA) expecting to employ an additional 0, 1-5, or 6 or more people in the next five years (all % of adults aged 18-64)

Job growth expectations				
	Cyprus	Greece	Luxembourg	Europe
0 jobs	3.1%	1.8%	1.9%	3.8%
1-5 jobs	4.5%	2.8%	3.4%	3.0%
6 or more jobs	0.8%	1%	2%	1.8%

Figure 3.19: Adults starting a new business with products or services that are either new to their area, new to their country or new to the world (all % of adults aged 18-64)

Innovation				
	Cyprus	Greece	Luxembourg	Europe
Local only	1.3%	0.8%	1%	1.3%
National	1.1%	0.7%	2%	0.8%
International	0%	0.3%	0.9%	0.5%

Figure 3.20: The percentage of adults (aged 18-64) both starting or running a new business and anticipating 25% or more revenue from outside their country

New business expectations				
	Cyprus	Greece	Luxembourg	Europe
Expecting 25% or more revenue from outside their country	1.2%	1.4%	1.7%	1.3%

Figure 3.21: The proportion of adults starting or running a new business using technology or processes that are either new to their area, new to their country or new to the world (all % of adults aged 18-64)

Proportions of adults starting or running a new business (technology or processes)				
	Cyprus	Greece	Luxembourg	Europe
New to their area	2%	0.7%	0.4%	1.1%
New to their country	1%	0.7%	0.8%	0.8%
New to the world	0.1%	0.1%	1%	0.4%

Figure 3.22: Reasons for business exit

Business exit reasons				
	Cyprus	Greece	Luxembourg	Europe
COVID-19 pandemic	1.1%	0.1%	0.4%	0.7%
Negative, not including COVID-19 pandemic	3.3%	1.4%	2.8%	2.0%
Positive	1.3%	0.5%	0.9%	0.8%
Total	5.7%	2.0%	4.2%	3.5%

Figure 3.23 Environmental and Societal consideration (% adults)

	The % of those starting or running a new or established business who agree/strongly agree that they always consider the social implications of decisions		The % of those starting or running a new or established business who agree/strongly agree that they always consider the environmental implications of decisions	
	% TEA	% EBO	% TEA	% EBO
Cyprus	68	72.3	65.9	72.7
Greece	76	66.6	83.5	77.4
Luxembourg	72.2	96.3	71.2	78.8
Europe	70.8	67.1	71.5	70.6

during these turbulent times, the COVID-19 pandemic is an additional negative reason. The pandemic may have hit a business profit directly because of possible illness, lockdown restrictions or other disruptions, or indirectly through its impact on markets and supply chains. Even if business exits are relevant to business closure, this might contribute to important structural changes which release resources that can then be used to improve products or services, which have a wider target audience. However, there are also positive reasons to exit a business. These include the opportunity to sell a business or some other business opportunity. In these cases, business exits serve as an important proxy of the dynamic of the entrepreneurial economy and the ecosystem. Exit reasons may vary; some are positive, while others are negative. Figure 3.23 illustrates the overall business exits recorded in 2021/2022. In Cyprus, 5.7% of the population denoted a business exit associated with their entrepreneurial activity, 1.3% were related to positive reasons, 3.3% to negative reasons excluding the COVID-19 pandemic and 1.1% were directly associated with the implications of the COVID-19 pandemic. Compared to Greece and Luxembourg, in the past year Cyprus has recorded a higher number of total business exits as the corresponding rate for these countries is 2% and 4.2% respectively. Cyprus' exit rate is also higher compared to the EU average rate (3.5%). This is also reflected on the reasons for exit percentages of the adult population who noted that their businesses experienced positive, negative and pandemic-related exits. Compared to Greece, Cyprus had a larger proportion of exits associated with the COVID-19 pandemic (Greece only had 0.1% pandemic-related exits from its total of 2% exits this year).

### Social and Environmental Responsibility

While the recovery from the pandemic is expected to provide new opportunities to live and work differently, we are also looking into facilitating a fairer and more equal society that allows for work opportunities and incomes without damaging the future. Businesses are thus starting to pay closer attention to the social and environmental implications of their strategy. This year's APS included questions towards those starting or running a business, on whether they always consider the social implications when making decisions about the future of their business. Figure 3.22 illustrates the percentages of those who have positively responded with somewhat or strongly agree. In Cyprus, most of the TEA and established business entrepreneurs appear to consider the social and environmental implications of their activity, as 68% of TEA entrepreneurs in Cyprus consider the social implications of their decisions and 65.9% consider the environmental implications of their decisions. The corresponding rates for established businesses are even higher, as 72.3% of EBO consider the social implications of their decisions while 72.7% consider the environmental implications of their decisions.

### Implications of the COVID-19 pandemic

This year's GEM APS also invited those starting or running a new business to provide insights on the impact of the pandemic. The survey asked them whether they agree that the pandemic had provided new opportunities that they want to pursue, while those running an established business were asked whether the pandemic had led to new business

Figure 3.24 COVID-19 pandemic and impact on TEA starting a business and getting the business operational

	The % of those starting or running a new or established business who agree/strongly agree that the pandemic has provided new opportunities that they want to pursue/are pursuing		The % of those starting or running a new or established business who think starting a business is somewhat or much more difficult to a year ago		The % of those starting or running a new or established business who expect to use more digital technologies to sell products or services in the next six months	
	% TEA	% EBO	% TEA	% EBO	% TEA	% EBO
Cyprus	39.4	19.1	43.6	36	53.1	46.2
Greece	28.9	14.9	41.1	56.9	57.4	30
Luxembourg	46.8	30.7	38.8	44.2	48.8	33
Europe	38.8	27.5	36.6	38.2	41.5	29.9

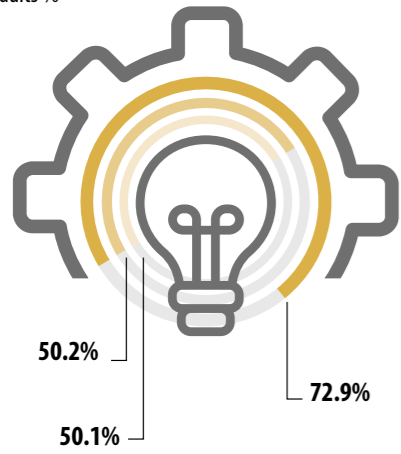
opportunities that were currently being pursued. Both sets of responses are illustrated in Figure 3.24. In Cyprus, 39.4% of TEA entrepreneurs see new opportunities arising by the pandemic. This rate is close to the corresponding EU average rate (38.8%), higher than Greece (28.9%) but lower to Luxembourg's rate (46.8%). The results also demonstrate that overall TEA entrepreneurs see more opportunities compared to new business owners. In Cyprus, 19.1% of established business owners see pandemic-provided opportunities they wished to pursue and thus established business owners are less optimistic regarding pandemic related opportunities compared to TEA entrepreneurs. Cyprus' rate on established business owners and new opportunities is also notably lower compared to the EU average (27.5%). In Cyprus, TEA entrepreneurs see more difficulties in starting a business compared to a year ago, as 43.6% of TEA agreed with the related statement. The rate regarding established business owners is 36%. However, in other countries across Europe, compared to TEA entrepreneurs, established business owners see more difficulties in starting a business than a year ago as the corresponding rates are 38.2% for EOB and 36.6% for TEA. This year's GEM APS also enquired on businesses who expect to use more digital technologies in order to sell products or services in the next six months. In Cyprus, 53.1% of TEA entrepreneurs confirmed that they expect to use more digital technologies in the near future, whereas 46.2% of EBO entrepreneurs also confirmed a similar intention. These rates are higher compared to the EU average rates, highlighting that entrepreneurs in Cyprus expect to intensify the digital transformation of their businesses in the near future.

Business establishment in Cyprus has improved compared to the first pandemic year. Overall, the society now views more opportunities for initiating entrepreneurial endeavors, whereas the proportion of the population who personally know an entrepreneur is increasing, demonstrating in this way that the society is becoming more aware of entrepreneurship as a career choice. Although a proportion of TEA and established business owners view that there are difficulties in starting a business compared to a year ago, a notable number also views new opportunities arising and intends to use more digital technologies to sell products or services in the near future. Along the same lines, TEA rate in Cyprus remained stable in the second year of the pandemic, demonstrating that there has been no further reduction of the TEA entrepreneurship due to the COVID-19 pandemic. These results are possibly associated with the fact that the government has relaxed some of the lockdown measures compared to the first year, where more strict pandemic restrictions were implemented. Entrepreneurs are still starting or running their businesses despite the challenges, which is an indicator of their determination and resilience. Despite the signs of an economic stability or even recovery, these fledgling businesses may need extra support to survive into maturity under the current harsh conditions.

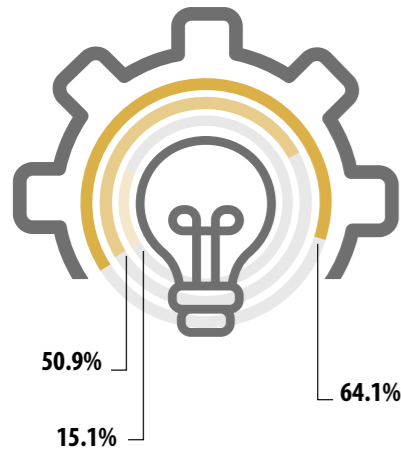


## ATTITUDES AND PERCEPTIONS

Adults %



- Know someone who has started a new business
- Good opportunities to start a business in my area
- Fear of failure

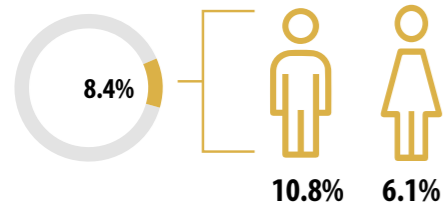


- Personally have the skills and knowledge
- It is easy to start a business
- Entrepreneurial intentions

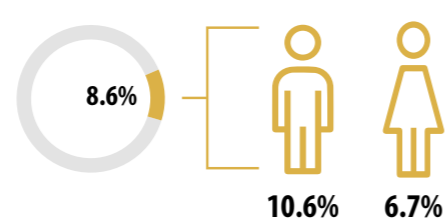
## ACTIVITY

Adults %

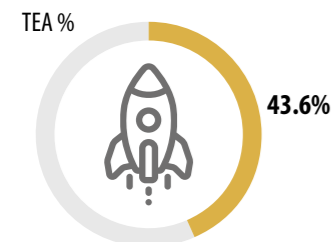
Total early-stage Entrepreneurial Activity



Established Business Ownership rate



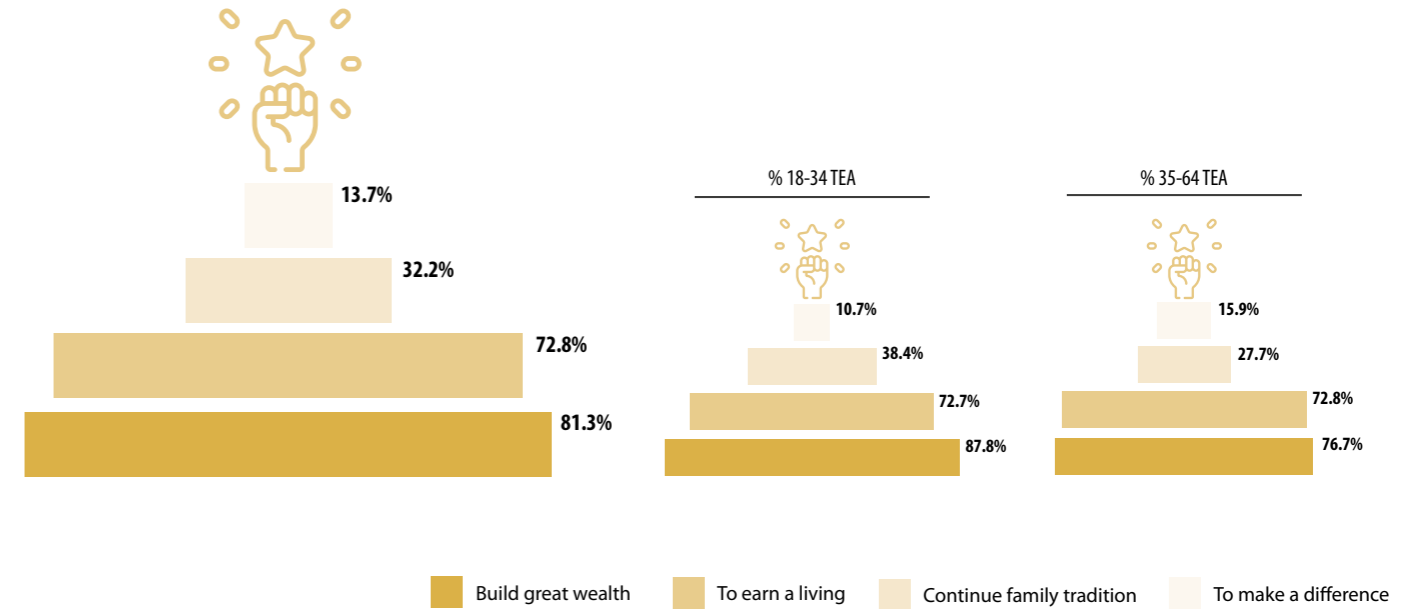
Starting a business is more difficult than a year ago



## MOTIVES

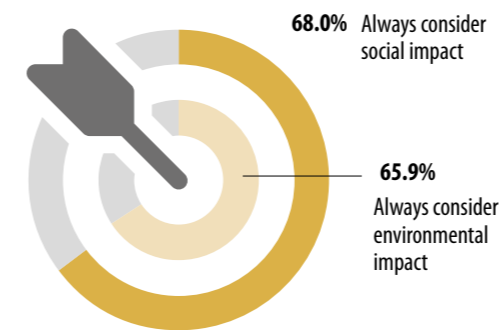
(somewhat or strongly agree)

Adults %



## ENTREPRENEURSHIP IMPACT

Adults %



PHYSICAL INFRASTRUCTURE  
5.3 out of 9



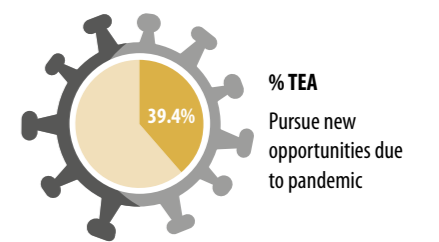
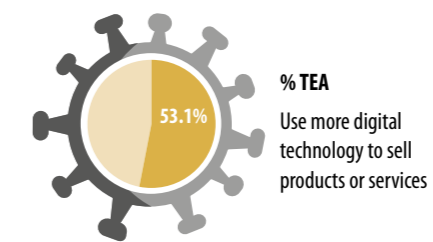
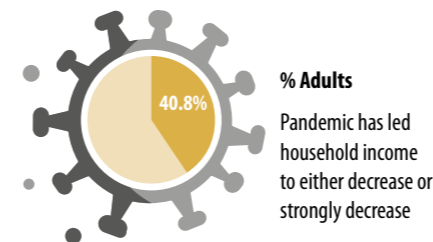
COMMERCIAL & LEGAL INFRASTRUCTURE  
5.4 out of 9



TAXES & BUREAUCRACY  
5.2 out of 9

## COVID-19-RELATED

Adults %





# THE ENTREPRENEURSHIP ECOSYSTEM



APS focuses on one's personal decision to become an entrepreneur and its influences and consequences; this decision, however, is not made in a vacuum. It is also shaped by the entrepreneurial environment in which it is made. The entrepreneurial environment determines how early-stage entrepreneurial activity will progress so as the business venture can grow from a nascent enterprise to a new business and then to an established business. The context such as family and friends or access to funding and other resources such as premises, infrastructure or expertise may

act either as facilitators or as burdens of the entrepreneurial endeavor. Along the same lines, markets may be free and open to low-cost easy access, or may be tightly controlled by a few large businesses acting to ensure that small-scale entry is prohibitively expensive. At global level in 2021, as in 2020, the environment for starting a business has been heavily influenced by the pervasive grip of the coronavirus pandemic, and the actions of governments in response. While some entrepreneurs have seized on new business opportunities, others have seen their business plans deferred or derailed.

# 4

The decision to start a business may be personal to the individual. The business environment for that decision however, is an important factor that shapes entrepreneurial intentions. The National Expert Survey (NES) provides useful insights on the strengths and weaknesses of the entrepreneurial ecosystem facilitating or hindering the growth of these entrepreneurial indexes. Although entrepreneurial activity may exist even under the most difficult and unexpected circumstances, it may also fail to flourish even in the most favorable conditions. GEM describes and assesses an economy's entrepreneurial ecosystem against nine Economic Framework Conditions (EFCs) described in Table 4.1. The EFCs have been included in the GEM methodology for over two decades and are employed to measure the key influencing factors and their impact on entrepreneurial activity. The state of these EFCs can encourage, constrain or completely discourage either the setting up of new businesses, or the development of new startups into established businesses which can generate sustained incomes and jobs.

The NES reflects on these nine conditions by considering each of them as multidimensional, and seeks out expert views on the sufficiency or otherwise of each condition by carrying out a National Expert Survey (NES) in each economy. NES invites experts to respond to a survey, structured across those nine different conditions, which shape a country's entrepreneurship ecosystem. Each of the Entrepreneurial

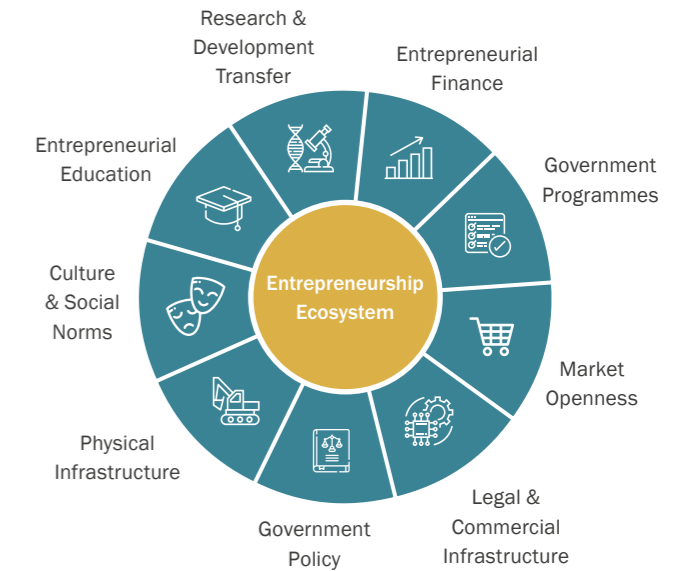
Framework Conditions (EFCs) is measured using a set of items. The EFCs included in the NES methodology are Entrepreneurial Finance, Culture and Social Norms, Government Programs, Legal and Commercial Infrastructure, Government Policy, Physical Infrastructure, Entrepreneurship Education, Market Openness and Research and Development Transfer. NES Cyprus 2021/2022 draws on 36 national experts, who have been selected based on their knowledge, experience and exposure to Cyprus' entrepreneurial environment. Some of the experts have also participated in last year's NES study. This approach is followed by all economies participating in GEM in order to reduce bias and ensure objectivity. The Framework Conditions, summarized in Table 6.1, are scored according to an 11-point Likert scale, ranging from completely untrue (0) to completely true (10). Figure 4.1 illustrates the EFCs included in NES this year.

The NES asks the same questions of at least 36 national experts in each economy, and often more, each of whom has an identified high level of expertise in at least one of the framework conditions. In 2021, the 50 National Teams participating in the GEM NES43 surveyed a total of 2,076 experts, each one identified by the National Team with prior approval by GEM Global. All experts completed the NES questionnaire by scoring their national economy against the extent to which they agreed or did not agree to questions about each framework condition. The Framework Conditions, summarized in Table 6.1, are scored according to an 11-point

Likert scale, ranging from completely untrue (0) to completely true (10). In 2021, the NES incorporated a new topic related to the ease of accessing funds for entrepreneurship. As a result, the financing pillar in the survey now has two parts: the traditional focus on sufficiency of funds, supplemented by an additional opportunity to score the relative ease of access to those funds. The NES also added some questions relating to special areas of interest, such as responses to the pandemic, progress and support to digitalization and teleworking, and the growth of the gig economy as a startup driver and business model. Another new block of questions concerned support for women entrepreneurs.

The NES results exhibit the strengths and the weaknesses of each country's entrepreneurial ecosystem. In Cyprus, in 2021/2022 the commercial and legal infrastructure alongside with the physical infrastructure and government policy with regards to taxes and bureaucracy are the key strengths of the local ecosystem.

Figure 4.1: Entrepreneurial Framework Conditions (EFCs)



**ACCESS TO ENTREPRENEURIAL FINANCE**  
Are there sufficient funds for new startups? Are those funds easy to access?

**GOVERNMENT POLICY**  
Support and Relevance: Do they promote and support startups? Taxes and Bureaucracy: Are new businesses burdened?

**GOVERNMENT ENTREPRENEURSHIP PROGRAMMES**  
Are quality support programs available?

**RESEARCH AND DEVELOPMENT TRANSFERS**  
Can research be translated into new businesses?

**COMMERCIAL AND PROFESSIONAL INFRASTRUCTURE**  
Are these sufficient and affordable?

**ENTREPRENEURSHIP EDUCATION AT SCHOOL**  
Do schools introduce entrepreneurship ideas?

**ENTREPRENEURSHIP EDUCATION POST SCHOOL**  
Do colleges offer courses in starting a business? with entrepreneurial values such as enquiry, opportunity recognition and creativity?

**EASE OF ENTRY: MARKET DYNAMICS**  
Are markets free, open and growing?

**EASE OF ENTRY: MARKET BURDENS AND REGULATIONS**  
Do regulations encourage or restrict entry?

**PHYSICAL INFRASTRUCTURE**  
Is this sufficient and affordable?

**SOCIAL AND CULTURAL NORMS**  
Does culture encourage and celebrate entrepreneurship?

Figure 4.2: Cyprus' EFCs in the last two years

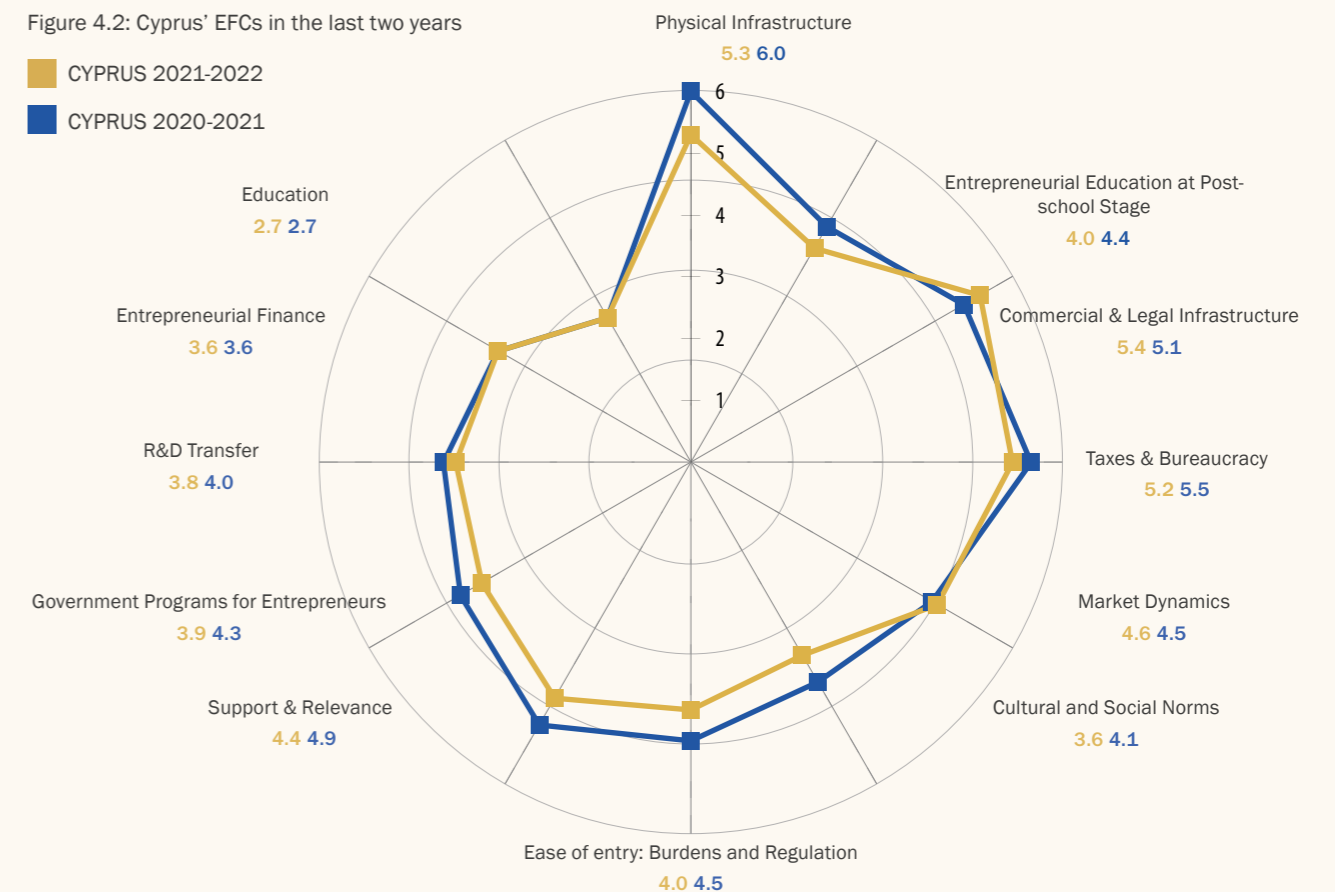


Figure 4.3: Cyprus' and Europe's EFCs in the last two years

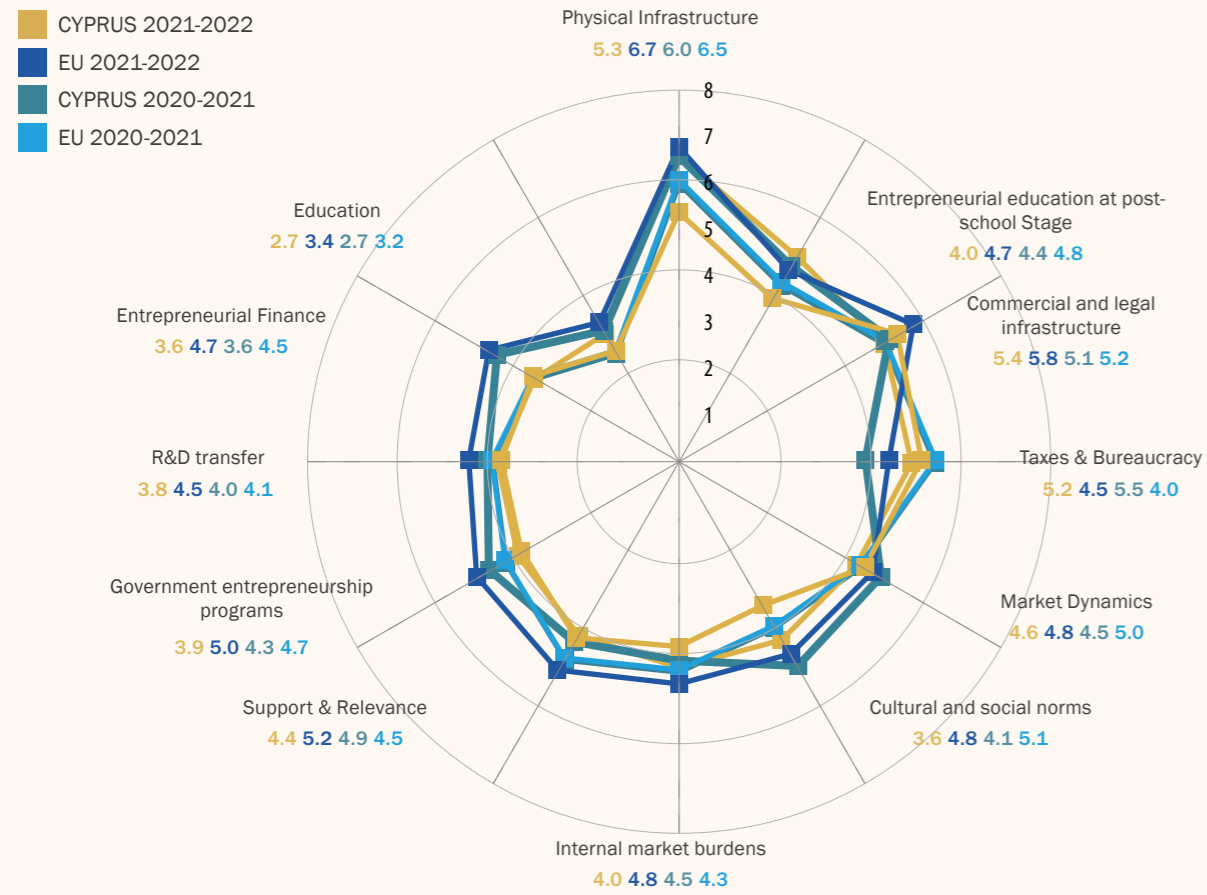


Figure 4.5: Entrepreneurial framework condition scores in Cyprus and Luxembourg in 2021/2022

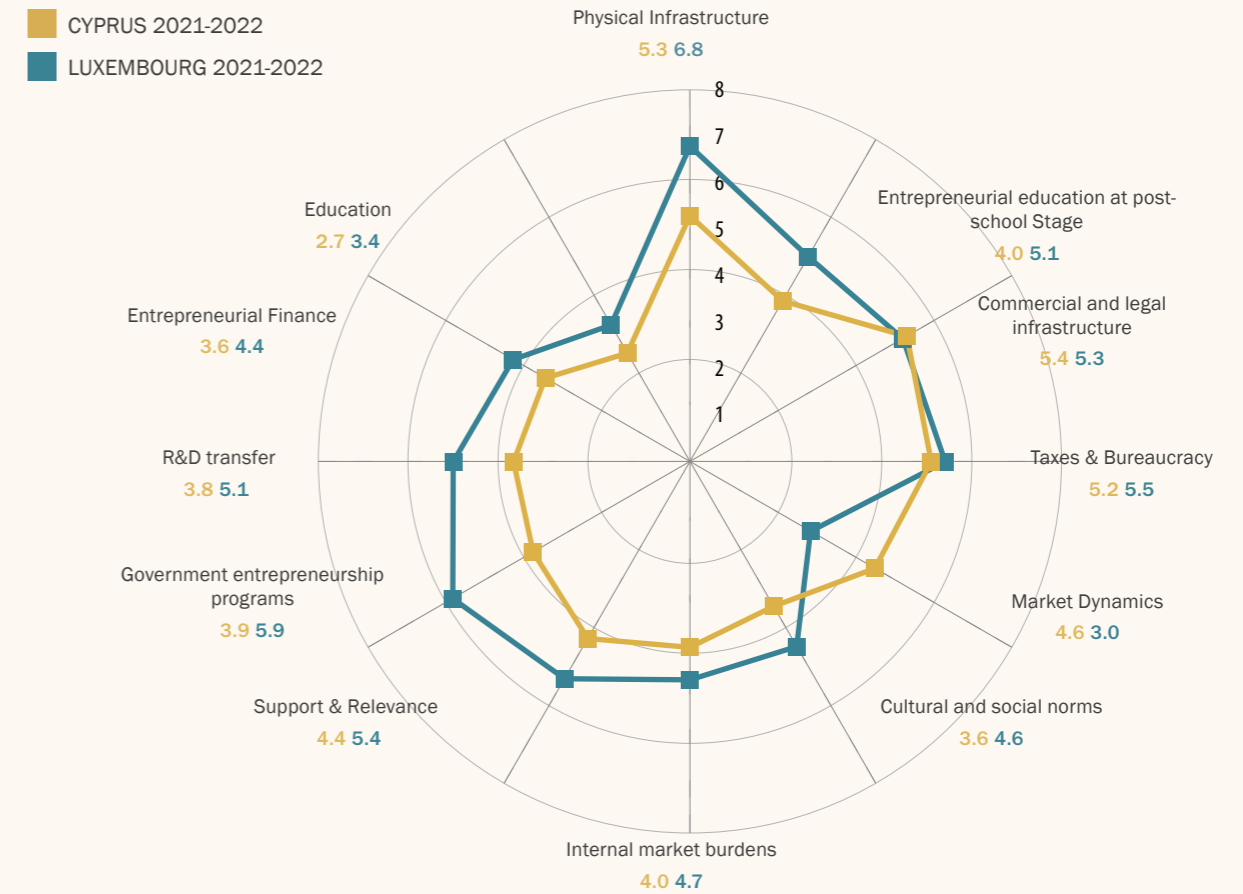


Figure 4.4: Entrepreneurial framework condition scores in Cyprus and Greece in 2021/2022

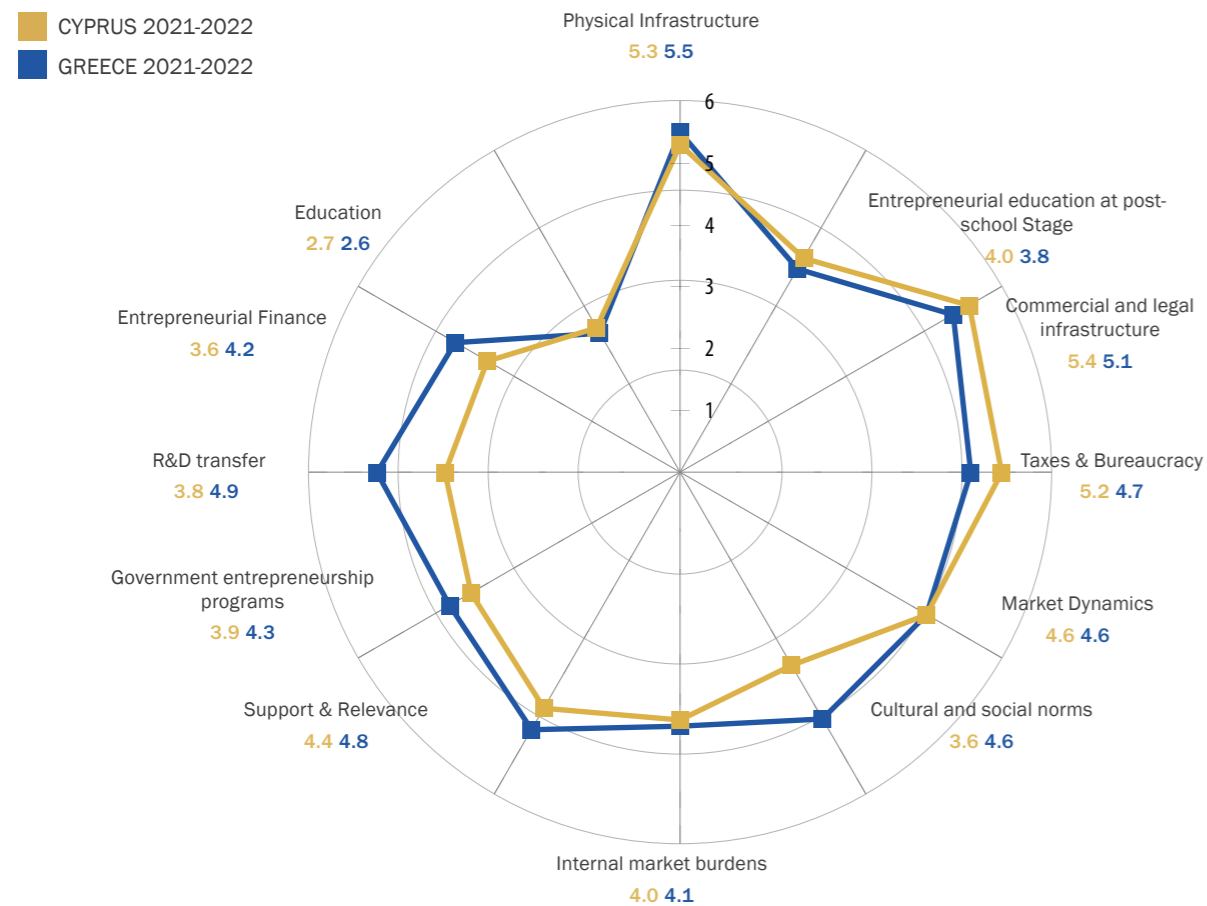


Figure 4.6: Entrepreneurial framework condition scores in Cyprus and other countries in 2020/2021

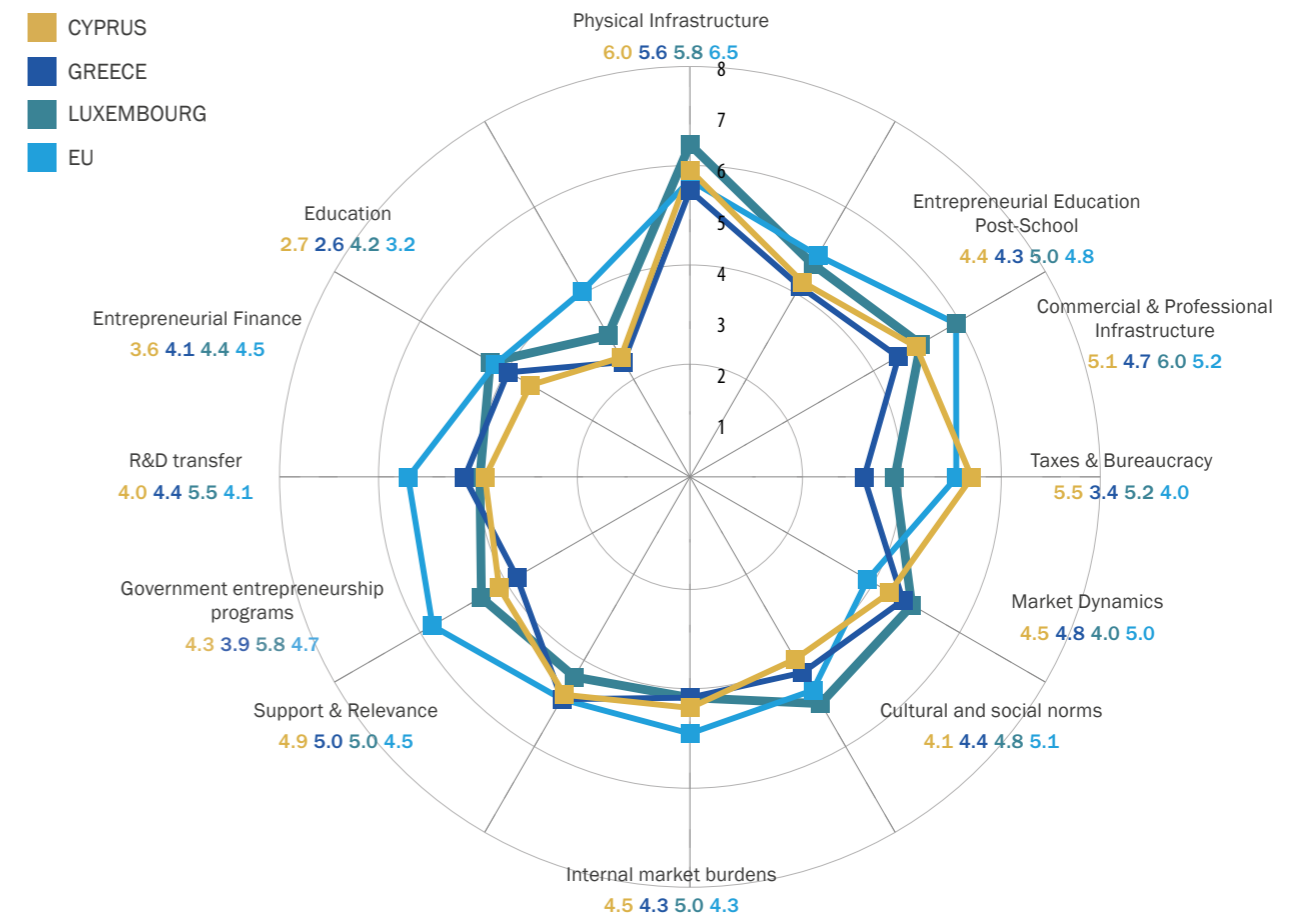
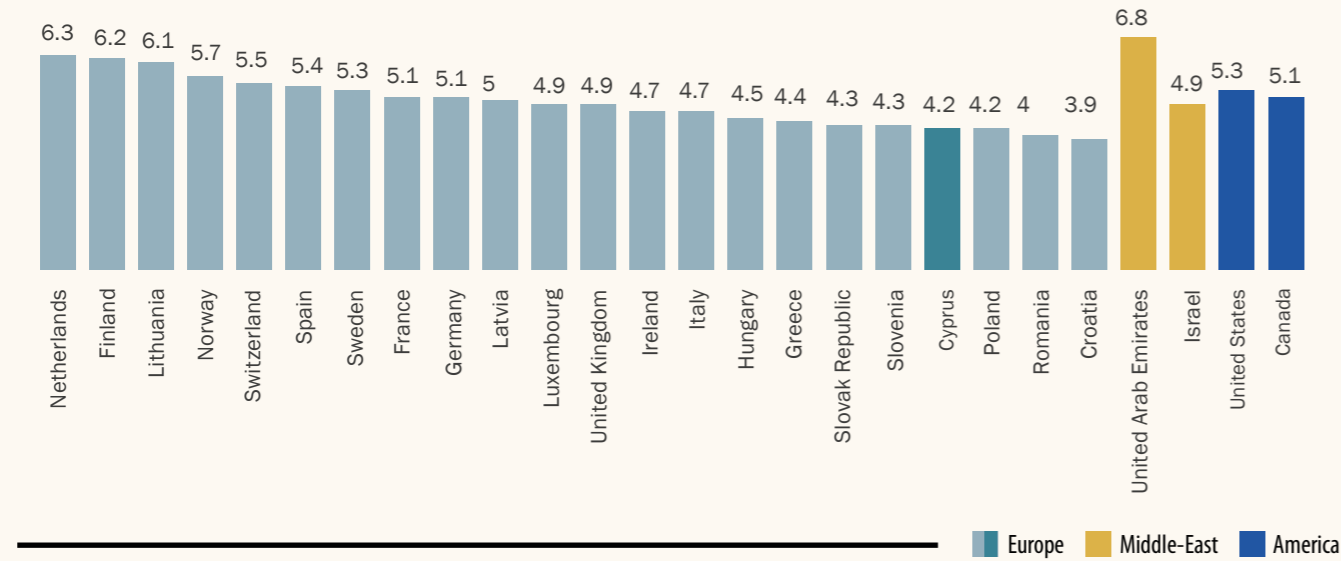


Figure 4.7: NECI values for countries of European regional area and other selected economies



The overall NECI score in Cyprus is lower by 0.3, compared to last year's results. However, a number of framework conditions support entrepreneurship in Cyprus. In particular, the most important entrepreneurial condition is Commercial & Legal Infrastructure (5.4), followed by Physical Infrastructure (5.3) and Government Policy on taxes & bureaucracy (5.2). These entrepreneurial conditions were reported as strengths in the 2020/2021 report. However, while the results of the previous years showed that Physical Infrastructure was the most important strength of the ecosystem, this year's results highlight Commercial & Legal Infrastructure as the most important condition. On the downside, the strongest weaknesses of the ecosystem persist across the years: Entrepreneurial Education at School Stage (2.7), Entrepreneurial Finance (3.6), Cultural and Social Norms (3.6), R & D Transfer (3.8) and Government Entrepreneurial Programs (3.9). These results highlight that these framework conditions need dedicated attention.

Compared to last year, in 2021/2022 the results show that the framework condition on Commercial & Professional Infrastructure has improved (from 5.1 in 2020/2021 to 5.4 in 2021/2022). There is also improvement in the Ease of Entry with regards to Market Dynamics (from 4.5 in 2020/2021 to 4.6 in 2021/2022). However, the scores of most of the entrepreneurial framework conditions have been reduced compared to last year. Most notably, the island's Physical Infrastructure, which was regarded as the most important strength across the previous years, dipped from 6.0 to 5.3. Similarly, although Government Policy: Taxes & Bureaucracy remains a strength of the ecosystem, the framework condition score has been reduced compared to last year (from 5.5 in 2020/2021 to 5.2 in 2021/2022). Along the same lines, the scores of Entrepreneurial Education Post-School, Social and Cultural Norms, Ease of Entry: Burdens and Regulation, Government Policy: Support & Relevance, Government Entrepreneurial Programs, R & D Transfer have been reduced, as illustrated in Figure 4.2.

The GEM NES methodology also enables the comparison with the European average as illustrated in Figure 4.3. In

2021/2022, the scores of entrepreneurial ecosystems in Europe are overall higher compared to Cyprus' ecosystem. Although this conclusion is aligned with last year's results, in 2020/2021 Cyprus' entrepreneurial ecosystem scored higher compared to the European average scores on three framework conditions; Government Policy on Taxes & Bureaucracy Ease of Entry: Burdens and Regulation and Government Policy: Support & Relevance. In 2021/2022, Cyprus scored higher to the European framework conditions only on Government Policy on Taxes & Bureaucracy. These results is also reflected in Cyprus' NECI index score which shows that Cyprus' entrepreneurial framework conditions were more supportive for entrepreneurs in 2020/2021 compared to 2021/2022.

NES results also enable the comparison with specific countries. For this report, Greece and Luxembourg were employed as benchmark countries. Compared to Greece, Cyprus scores higher on Commercial & Professional Infrastructure (5.4 to 5.1), Government Policy in terms of Taxes & Bureaucracy (5.2 to 4.7) and Entrepreneurial Education Post-School (4.0 to 3.8). However, as illustrated in Figure 4.4, Cyprus scores lower than Greece on entrepreneurial conditions such as Social and Cultural Norms (3.6 to 4.6), Government Policy: Support & Relevance (4.4 to 4.8), Government Entrepreneurial Programs (3.9 to 4.3), R & D Transfer (3.8 to 4.9) and Entrepreneurial Finance (3.6 to 4.2). Compared to Luxembourg, Cyprus scores higher only on Commercial & Professional Infrastructure (5.4 to 5.3) and Ease of Entry: Market Dynamics (4.6 to 3), but lags behind on all other conditions (Figure 4.5). In order to also enable the comparison of their entrepreneurial framework conditions across time, Figure 4.6 illustrates the 2020/2021 entrepreneurial framework conditions between Cyprus, Greece, Luxembourg and Europe.

GEM measures the overall arithmetic mean of that economy's EFC scores and summarizes the average state of the ecosystem for entrepreneurship in each economy indicated by the National Entrepreneurship Context Index (NECI). According to Figure 4.7, Netherlands (6.3), Finland (6.2) and Lithuania (6.1) are the countries of the European regional area with the most supportive entrepreneurial ecosystems. Conversely,

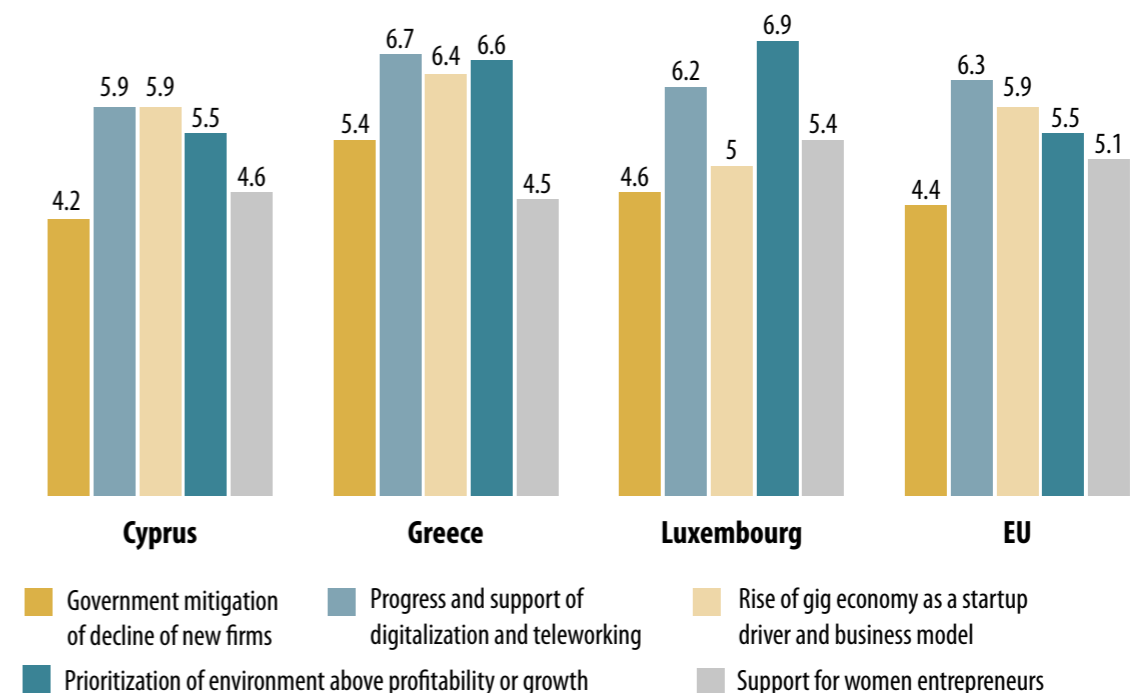
the countries of the region with the lowest NECI scores are Croatia (3.9), Romania (4), Poland (4.2) and Cyprus (4.2). These results signal the need for addressing the challenges of the entrepreneurial ecosystem in Cyprus to better facilitate and support entrepreneurship.

The NES methodology of 2021/2022 also measured special topics of interest, so as to shed light on the responses to the pandemic, progress and support to digitalization and teleworking, and the growth of the gig economy as a startup driver and business model, and the support for women entrepreneurs. As illustrated in Figure 4.8, the Cyprus score with regards to mitigating the decline of new firms is 4.2, which is lower compared to the European average of 4.4 and to the scores of Greece (5.4) and Luxembourg (4.6). Progress and support provided for digitalization and teleworking in Cyprus' businesses was positively scored by the experts (5.9). However, this score is lower compared to the European average score (6.3) and the scores of Greece (6.7) and Luxembourg (6.9). Similarly, the measures to support the rise of gig economy as a startup driver and business model in Cyprus are perceived as positive (5.5). This score is aligned with the corresponding European average score, higher compared to Luxembourg (5) and lower compared to Greece (6.4). Measures to prioritize the environment above profitability or growth were also perceived as positive (5.5). While that score is aligned with the European average rate, it is lower compared to the measures taken in Greece (6.6) and Luxembourg (6.9). Finally, regarding the support provided for women entrepreneurs, Cyprus' score (4.6) is higher compared to Greece (4.5) but lower compared to Luxembourg (5.4) and Europe (5.1).

The rest of this Section discusses the results of each of the core framework conditions<sup>1</sup> measured by GEM NES in detail.

<sup>2</sup> The item values presented for each framework condition are not weighted

Figure 4.8: Additional entrepreneurial framework conditions measured in 2021/2022



## 4.1 STRENGTHS AND WEAKNESSES OF THE ENTREPRENEURIAL ECOSYSTEM IN CYPRUS

### Physical Infrastructure

The quality of Cyprus' contemporary infrastructure has been reflected in the Physical Infrastructure framework condition score. Indeed, this framework condition has been regarded by the experts as one of the strongest benefits of the island's entrepreneurial ecosystem, although it has scored lower compared to last year's results. Experts perceive that the island offers good access to communications (telephone, internet, etc.) (6.1 in 2021/2022) and to utilities (gas, water, electricity, sewer) (6.3 in 2021/2022) in about a month. Physical infrastructure for new and growing firms (regarding roads, utilities, communications and water disposal services) is also perceived as positive (5.5 in 2021/2022). Although these factors are perceived as benefits by the experts, the score provided is lower both compared to the previous years and to the corresponding European average scores. According to the experts, physical infrastructure in Cyprus lacks sufficient infrastructure in terms of affordable office spaces (3.8 in 2021/2022) and production spaces to rent for new and growing firms (4.9 in 2021/2022). As shown in Table 4.1, scores are lower compared to the corresponding European average values for affordable office spaces (6.2 in 2021/2022) and production spaces (5.5 in 2021/2022).

### Commercial and Services Infrastructure

Access to good commercial and services infrastructure is important for new and growing businesses. This particular framework condition is the most important strength of the Cyprus ecosystem in 2021/2022. Experts perceive that it is easy for new and growing firms to get good, professional legal

Table 4.1: Physical Infrastructure\*

	2019/2020	2020/2021	2021/2022	2021/2022	2021/2022	2021/2022
The physical infrastructure (roads, utilities, communications, water disposal) provides good support for new and growing firms	6.1	6.1	5.5	5.0	7.7	6.5
It is not too expensive for a new or growing firm to get good access to communications (phone, Internet, etc.)	5.3	5.4	5.0	4.8	6.2	7.2
A new or growing firm can get good access to communications (telephone, internet, etc.) in about a week	7.4	7.3	6.1	6.1	6.9	7.3
New and growing firms can afford the cost of basic utilities (gas, water, electricity, sewer)	6.0	5.6	5.8	5.6	7.5	7.2
New or growing firms can get good access to utilities (gas, water, electricity, sewer) in about a month	7.8	7.5	6.3	6.7	8.2	7.0
There are plenty of affordable office spaces to rent for new and growing firms	-	-	3.8	6.0	5.0	6.2
There are plenty of affordable production spaces to rent for new and growing firms	-	-	4.9	5.3	4.4	5.5

Table 4.2: Commercial and services infrastructure\*

	2019/2020	2020/2021	2021/2022	2021/2022	2021/2022	2021/2022
There are enough subcontractors, suppliers, and consultants to support new and growing firms	5.0	5.6	5.4	6.0	6.1	6.1
New and growing firms can afford the cost of using subcontractors, suppliers, and consultants	4.1	3.9	3.8	3.4	3.3	4.3
It is easy for new and growing firms to get good subcontractors, suppliers, and consultants	4.5	4.6	5.1	4.7	4.4	5.0
It is easy for new and growing firms to get good, professional legal and accounting services	6.1	5.9	6.0	5.5	6.0	6.3
It is easy for new and growing firms to get good banking services (checking accounts, foreign exchange transactions, letters of credit)	5.8	5.7	6.2	4.7	4.9	6.3
New and growing firms can get access to cloud computing services at affordable prices	-	-	-	6.5	6.3	6.9

Table 4.3: Government policies\*

	2019/2020	2020/2021	2021/2022	2021/2022	2021/2022	2021/2022
Government policies (e.g., public procurement) consistently favor new firms	3.7	5.0	4.1	4.1	5.0	3.9
The support for new and growing firms is a high priority for policy at the national government level	5.5	5.8	5.3	6.0	6.0	4.8
The support for new and growing firms is a high priority for policy at the local government level	3.6	3.9	3.6	4.2	5.2	4.5
Entrepreneurs can register new firms/businesses at reasonable cost.	-	-	6.0	6.7	6.6	7.4
New firms can get most of the required permits and licenses in about a week	2.2	2.9	2.9	3.5	3.5	4.7
The amount of taxes is NOT a burden for new and growing firms	7.5	7.3	7.1	4.1	5.7	4.7
Taxes and other government regulations are applied to new and growing firms in a predictable and consistent way	6.0	7.2	6.1	3.7	6.2	4.7
Coping with government bureaucracy, regulations, and licensing requirements is not unduly difficult for new and growing firms	4.1	4.5	4.2	3.7	5.3	4.2

\*(scale: 1=completely false, 9=completely true)

Table 4.4: Entrepreneurial Education & Training\*

	2019/2020	2020/2021	2021/2022	2021/2022	2021/2022	2021/2022
Teaching in primary and secondary education encourages creativity, self-sufficiency, and personal initiative	3.1	2.9	2.9	2.7	4.0	3.8
Teaching in primary and secondary education provides adequate instruction in market economic principles	3.5	3.0	2.9	2.9	3.6	3.4
Teaching in primary and secondary education pays adequate attention to entrepreneurship and new firm creation	2.9	2.3	2.2	2.4	3.1	3.0
Colleges and universities provide adequate preparation for starting up and growing new firms	5.0	4.9	3.8	4.0	5.5	4.6
The level of business and management education provides adequate preparation for starting up and growing new firms	5.6	4.1	4.2	3.5	4.6	4.9
The vocational, professional, and continuing education systems provide adequate preparation for starting up and growing new firms	4.6	4.1	3.7	3.7	5.1	4.5

Table 4.5: Government entrepreneurship programs\*

	2019/2020	2020/2021	2021/2022	2021/2022	2021/2022	2021/2022
A wide range of government assistance for new and growing firms can be obtained through contact with a single agency	3.7	4.1	3.5	4.1	6.4	4.5
Science parks and business incubators provide effective support for new and growing firms	4.1	4.4	2.1	4.6	5.7	5.4
There is an adequate number of government programs for new and growing businesses	4.6	5.0	4.7	5.5	5.8	5.4
The people working for government agencies are competent and effective in supporting new and growing firms	3.8	3.6	3.3	2.8	6.1	4.7
Almost anyone who needs help from a government program for a new or growing business can find what they need	3.5	3.9	3.9	3.5	5.3	4.5
Government programs aimed at supporting new and growing firms are effective	4.2	4.9	5.0	4.1	5.5	4.7

Table 4.6: Access to finance\*

	2019/2020	2020/2021	2021/2022	2021/2022	2021/2022	2021/2022
There is sufficient equity funding available for new and growing firms	3.8	4.1	4.1	4.2	4.7	5.0
There is sufficient debt funding available for new and growing firms	4.5	4.7	4.6	3.7	4.4	5.3
There are sufficient government subsidies available for new and growing firms	5.1	5.4	5.5	5.3	5.5	5.6
There is sufficient funding available from informal investors (family, friends and colleagues) who are private individuals (other than founders) for new and growing firms	4.6	4.2	4.3	4.9	5.6	5.1
There is sufficient professional Business Angels funding available for new and growing firms	3.5	3.4	3.7	4.0	4.7	5.0
There is sufficient venture capitalist funding available for new and growing firms	2.5	2.6	2.7	5.3	4.4	5.1
There is sufficient funding available through initial public offerings (IPOs) for new and growing firms	2.6	2.6	1.9	2.8	3.3	4.1
There is sufficient private lenders' funding (crowdfunding) available for new and growing firms	2.5	2.1	2.2	3.0	3.7	4.5
It is easy to hire financial support services at reasonable cost for new and growing firms	-	-	5.2	4.5	3.5	5.0
It is easy for nascent entrepreneurs to get enough seed capital to cover start-up and early-stage expenses of a new business	-	-	4.4	3.7	4.2	4.4
It is easy to attract investors / funds to make a new business grow once the start-up phase is completed	-	-	3.5	4.1	4.7	4.7

\*(scale: 1=completely false, 9=completely true)

Table 4.7: Cultural and social norms\*

	2019/2020	2020/2021	2021/2022			
The national culture is highly supportive of individual success achieved through own personal efforts	5.2	4.7	4.1	5.9	5.4	5.0
The national culture emphasizes self-sufficiency, autonomy, and personal initiative	4.9	4.4	3.8	5.0	4.5	4.8
The national culture encourages entrepreneurial risk-taking	3.4	3.2	2.7	3.5	3.5	4.1
The national culture encourages creativity and innovativeness	4.1	3.8	3.6	4.1	4.7	5.0
The national culture emphasizes the responsibility that the individual (rather than the collective) has in managing their own life	4.5	4.5	4.0	4.6	5.1	5.0

Table 4.8: Internal market dynamics and burdens \*

	2019/2020	2020/2021	2021/2022			
The markets for consumer goods and services change dramatically from year to year	4.5	4.7	4.5	4.7	3.1	4.7
The markets for business-to-business goods and services change dramatically from year to year	4.3	4.8	4.7	4.6	3.0	4.6
New and growing firms can easily enter new markets	4.4	4.0	4.0	4.0	4.9	4.9
New and growing firms can afford the cost of market entry	3.9	3.6	3.3	3.5	4.2	4.4
New and growing firms can enter markets without being unfairly blocked by established firms	4.2	4.4	4.3	4.5	4.1	4.9
The anti-trust legislation is effective and well enforced	4.9	5.4	4.8	4.7	4.9	5.2

Table 4.9: Research and development transfer\*

	2019/2020	2020/2021	2021/2022			
New technology, science, and other knowledge are efficiently transferred from universities and public research centers to new and growing firms	3.9	3.9	3.8	4.5	5.3	4.5
New and growing firms have just as much access to new research and technology as large, established firms	3.9	4.3	4.1	4.3	4.2	3.9
New and growing firms can afford the latest technology	3.1	3.4	2.9	5.9	4.8	3.9
There are adequate government subsidies for new and growing firms to acquire new technology	3.6	3.9	3.8	5.2	5.5	4.4
The science and technology base efficiently supports the creation of world-class new technology-based ventures in at least one area	4.7	4.7	4.3	4.8	5.6	5.3
There is good support available for engineers and scientists to have their ideas commercialized through new and growing firms	3.9	3.8	3.7	4.5	5.3	4.8

\*(scale: 1=completely false, 9=completely true)

and accounting services (6). Similarly, experts highlighted that there are enough subcontractors, suppliers, and consultants to support new and growing firms (5.4). Regarding the access to subcontractors, suppliers, and consultants, the European average score is slightly lower (5 to Cyprus' 5.1), whereas access to good, professional legal and accounting services is higher in Europe (6.3 to Cyprus' 6). Despite the good quality of service offered, the experts perceive that the cost of using subcontractors, suppliers, and consultants is not affordable for new and growing firms (3.8). These results are aligned with the corresponding scores in Greece (3.4) and Luxembourg (3.3). In Cyprus, it is easy for new and growing firms to get good banking services (checking accounts, foreign exchange transactions, letters of credit) (6.1). In terms of its banking services, Cyprus' score (6.1) is higher compared to Greece (4.1) and Luxembourg (4.7)), but lower compared to the European average rate (6.3). Experts also believe that new and growing firms in Cyprus can get access to cloud computing services at affordable prices (6.2). Table 4.2 includes the detailed scores on all items under this framework condition.

### Government Policies

Cyprus' government has emphasized on formulating legal and tax regimes which can further support the growth of the island's entrepreneurial activity. This is also reflected in the score of the framework condition on Government Policy: Taxes & Bureaucracy for 2021/2022. Experts in Cyprus perceive that the amount of taxes is not a burden for new and growing firms (7.1). This score is higher compared to Europe (4.7), Greece (4.1) and Luxembourg (5.7). Experts also consider the fact that taxes and other government regulations in Cyprus are applied to new and growing firms in a predictable and consistent way, a strength of the island's ecosystem (6.1) which is higher compared to the European average score (4.7). Furthermore, entrepreneurs can register new firms/businesses at reasonable cost (6.0). However, according to the GEM NES results, the cost is less reasonable compared to , Greece (6.7), Luxembourg (6.6) as well as compared to the European average score (7.4). Despite the positive views on the legal and tax strategy implemented by the government, experts perceive that in Cyprus, the support for new and growing firms is not a high priority for policy at the local government level (3.6). Table 4.3 summarizes the findings on this entrepreneurial framework condition.

### Entrepreneurial Education and Training

Entrepreneurial education in Cyprus is consistently regarded as a burden for the country's entrepreneurial ecosystem across the years. GEM reflects both on entrepreneurial education at school and post-school stages. Experts highlighted the lack of sufficient entrepreneurial education at school level. They consider that teaching in primary and secondary education does not sufficiently encourage creativity, self-sufficiency, and personal initiative (2.9), that it does not provide adequate instruction in market economic principles (2.9) and does not pay adequate attention to entrepreneurship and new firm creation (2.2). The overall score on entrepreneurial education at school level is lower in 2021/2022 compared to the previous years and notably lower compared to the corresponding European average score on creativity, self-sufficiency, and personal initiative (3.8),

market economic principles and attention to entrepreneurship (3.4) and new firm creation (3).

Experts perceive that entrepreneurial education provided at post-school level in Cyprus is more sufficient compared to the education offered at school level. However, they consider that post-school entrepreneurial education is still a burden for the island's entrepreneurial ecosystem. They perceive that colleges and universities do not provide adequate preparation for starting up and growing new firms (3.8). This score is lower compared to the European average rate (4.6) and lower compared to the scores of Greece (4) and Luxembourg (5.5). Experts also consider that the level of business and management education does not provide adequate preparation for starting up and growing new firms in Cyprus (4.2). This score is also lower compared to Europe (4.9) and Luxembourg (3.6). Experts also consider that Cyprus lacks sufficient vocational, professional, and continuing education systems which could provide adequate preparation for starting up and growing new firms (3.7). This score is lower compared to the European average score (4.5). Table 4.4 provides an overview of the perceptions of national experts on entrepreneurial education.

### Government Entrepreneurship Programs

The Government Entrepreneurship Programs framework condition in Cyprus is not supportive for new and growing businesses. The score on this framework condition is lower compared to last year's results while corresponding scores in Europe, Greece and Luxembourg are notably higher, signaling the need for enhancing government entrepreneurship programs. Experts consider that there is a marginally adequate number of government programs for new and growing businesses (4.7). That is lower compared to Europe (5.4), Greece (5.5) and Luxembourg (5.8). Experts also view that government assistance for new and growing firms can not be easily obtained through contact with a single agency (3.5) and science parks and business incubators do not provide effective support for new and growing firms (2.1). The corresponding European average scores are higher regarding both single agency availability (4.5) and science parks and business incubators support (5.4). Compared to the previous years, we note that Cyprus' scores on both items are notably lower. Experts also view that in Cyprus, it is difficult for someone who needs help from a government program for a new or growing business to find what they need (3.9) and that the people working for government agencies are competent and effective in supporting new and growing firms (3.3). The only item where Cyprus did score higher to both Europe and Greece, is the effectiveness of government programs aimed at supporting new and growing firms (5 to 4.7 and 4.1 respectively).

### Financial environment for entrepreneurship

Access to finance is one of the most important facilitators of entrepreneurial growth. Although there have been efforts to improve the financial environment for entrepreneurship in Cyprus, this year's NES results indicate that according to experts, no remarkable changes have been recorded on this issue. On the positive side, experts view that there are sufficient government subsidies available for new and growing firms (5.5). This score is equal to the corresponding score of Luxembourg and higher compared to Greece (5.2). They also perceive that it is easy to hire financial support

services at reasonable cost for new and growing firms (5.2), a score which is higher compared to Europe (5), Greece (4.5) and Luxembourg (3.5). However, access to finance in terms of equity funding and debt funding is not sufficient. Experts consider that there is not sufficient equity funding available for new and growing firms (4.1), whereas the availability of debt funding for new and growing firms is marginal (4.6). Along the same lines, funding from professional Business Angels (3.7) and venture capitalist (3.2) is very limited. Access to funding from informal investors (family, friends and colleagues) may be easier compared to Business Angels or venture capitals, however it is still limited (4.3). Moreover, overall access to funding from different types of investors is difficult for new and growing businesses in Cyprus compared to Europe, Greece and Luxembourg. For example, Greek entrepreneurs have notably higher access to venture capitals (5.3). GEM NES 2021/2022 also reflects on access to finance with regards to startup maturity stage. In particular, experts view that although difficult for nascent entrepreneurs to get enough seed capital to cover start-up and early-stage expenses of a new business (4.4), it is even more difficult to attract investors / funds to make a new business grow once the start-up phase is completed (3.5). Table 4.6 summarizes all items employed for measuring this framework condition.

#### Cultural and social norms

Experts view that the Cultural and Social Norms is a framework condition which acts as a burden for the island's entrepreneurial ecosystem. Overall, the score of this framework condition has declined compared to last year's results. In particular, experts perceive that the national culture in Cyprus discourages entrepreneurial risk-taking (2.7, down from last year's 3.2 and 3.4 the year before). The culture in Europe, on the other hand, is notably more encouraging towards risk-taking (4.1). Moreover, the national culture in Cyprus does not sufficiently encourage creativity and innovativeness (3.6), a lower score compared to Europe (5), Greece (5) and Luxembourg (4.5). The national experts also report that Cyprus' national culture does not emphasize on self-sufficiency, autonomy, or personal initiative (3.8). Similar conclusions can be drawn when those results are compared to Greece (5) and Luxembourg (4.5), where cultural and social norms seem to be more open towards entrepreneurship. Table 4.8 summarizes the scores on each of the items relating to cultural and social norms for Cyprus and other countries.

#### Ease of Entry

The NES framework conditions also reflect on the ease of entry for new and growing businesses. This framework condition regards the internal market dynamics and internal market burdens or entry regulation in each economy. Experts in Cyprus consider that the anti-trust legislation is effective and well-enforced for new and developing firms (4.8), a score that is however lower compared to the previous year (5.4) and also lower compared to the European average rate (5.2). Experts are less optimistic on the cost of market entry and whether it is affordable for new and growing businesses (3.3). Compared to Cyprus, experts in Europe share similar are more optimistic on the affordability of market entry (4.4). Along the same lines, experts in Cyprus are not optimistic regarding the capacity of new and growing firms to easily enter new markets (4), a score that is lower compared to Europe (4.9). Their view

on whether new and growing firms can enter markets without being unfairly blocked by established firms is also pessimistic (4.3), also lower compared to the European average score (4.9) and Greece (4.5) but higher compared to Luxembourg (4.1). Table 4.8 summarizes the results regarding the internal market dynamics, internal market burdens and entry regulation condition.

#### Research and Development (R&D) Transfer

Research and Development in the academic and non-academic sectors as well as from the academic sector to industry can serve as an indicator of the expected growth of the entrepreneurial ecosystem, as it provides information on the potential for new business ventures to launch innovative and more competitive products or services. Despite the efforts to boost R&D transfer in Cyprus, experts view this framework condition as a burden of the ecosystem. They perceive that the latest technology is not affordable for new and growing businesses in Cyprus (2.9), a score that is notably lower compared to Greece (5.9) and Luxembourg (4.8). Experts also view the support available for engineers and scientists to have their ideas commercialized through new and growing firms as not sufficient (3.7), a score that is lower to the corresponding European average score (4.8). Regarding new technology, science, and other knowledge transferred from universities and public research centers to new and growing firms, experts in Cyprus perceive that the level of transfer is limited (3.8). In contrast, experts in Luxembourg are more optimistic on this item (4.5). Overall, results demonstrate that the R&D transfer in Cyprus is lower than that of Luxembourg, Greece and of other European countries and that no significant improvement has taken place across the years.

The results of the NES survey demonstrate that the entrepreneurial ecosystem in Cyprus encapsulates benefits which can support new and growing businesses. These mainly regard the Commercial and Services Infrastructure as well as the island's Physical Infrastructure, alongside with its Government Policy on taxes & bureaucracy. On the positive side, businesses in Cyprus have to some extent shifted towards digitalization and teleworking and there have been measures to support the rise of gig economy as a startup driver and business model. However, Cyprus' NECI index value indicates that the level of EFCs is low. This is attributed to several burdens of the country's entrepreneurial ecosystem, which have been recorded through this year's NES. These burdens persist across the years. Among others, burdens regard Entrepreneurial Finance, R & D Transfer and Cultural and Social Norms and Entrepreneurial Education. Overall, the NES results lead to the conclusion that compared to previous years, the level of EFCs in Cyprus has not improved; in fact, there has been a deterioration across the last couple of years. Additionally, Cyprus' NESI index value is lower to most of the European countries participating in GEM in 2021/2022, including Greece and Luxembourg. These results highlight the need for further public and private initiatives which can potentially contribute to the improvement of the challenges identified. The next Section reflects on GEM 2021/2022 results in order to provide policy recommendations.

# EXISTING POLICIES AND FUTURE POLICY RECOMMENDATIONS



Every economy, including Cyprus, is unique and operates within its own entrepreneurial ecosystem. Cyprus' 2021/2022 national GEM Report provides useful insights on the dynamic of entrepreneurship in the island during the second year of the pandemic and sheds light on its entrepreneurial ecosystem evolution. Entrepreneurship and innovation are important contributors to Cyprus' economy, and in 2021 the government took measures to blunt the negative impact of the pandemic. Social distancing and lockdown measures have inevitably disrupted economic activity and led to the modification of business models across industries.

The 2021/2022 Cyprus report motivates us to rethink strategies and support instruments for promoting entrepreneurship in the post-pandemic era, aiming to improve Cyprus' entrepreneurial ecosystem and elevate the resilience of its businesses towards future disruptions. Building on this year's results, as well as on earlier policy recommendations presented in the GEM Cyprus reports, this Section provides policy recommendations clustered in four categories: Education & Culture, Government & Policies, Financial Support and Business Support.

## EDUCATION AND CULTURE

This year's GEM results demonstrate that entrepreneurial education at school and post-school level in Cyprus is limited. According to the 2021/2022 NES, entrepreneurial training scored lower compared to the previous years on post-school entrepreneurial education, while school entrepreneurial education has been consistently identified as a burden of the island's entrepreneurial ecosystem across the years. The results highlight gaps in educating the population on creativity, market economics, and preparation for starting and growing firms. The results of the APS provide additional insights on the need for entrepreneurial education enhancement. This is reflected in Cyprus' persistent 'gender gap' in TEA involvement, which remains unchanged across the years. Additionally, although the population demonstrates confidence in terms of their capabilities to initiate entrepreneurial activity, there is an increasing level of fear of failure across the years. This demonstrates that the majority of the population is risk-averse towards entrepreneurial activity. These conclusions are also supported by the NES insights on the EFC on Cultural and Social norms, emphasizing that Cyprus' national culture does not sufficiently encourage entrepreneurial risk-taking. The report's findings also stress that there is lack of cultural support towards the skills that are important to entrepreneurship such as self-sufficiency, autonomy, personal initiative, creativity and innovativeness. The 2021/2022 GEM Cyprus results lead to a number of policy recommendations on education and culture:

### Primary and Secondary Education:

- Enhancing school curricula with activities that cultivate creativity, self-sufficiency, and personal initiative
- Including courses on topics relevant to financial management and market economic principles
- Introducing courses and activities which promote entrepreneurship and new firm creation
- Encouraging group work on developing business ideas
- Encouraging female involvement in STEM

- Training educators on how to include hands-on activities on entrepreneurship and innovation in different courses
- Encouraging educators to involve more students in entrepreneurship activities (e.g., competitions) appropriate for their age

### Tertiary Education:

- Encouraging colleges and universities to enhance all curricula with courses on business and financial management and on starting up and growing new firms
- Enhancing all academic programs to include courses and activities on entrepreneurship and innovation
- Providing the opportunity to university students to pause or adjust the pace of their studies while embarking on entrepreneurial journeys alongside their studies
- Inviting entrepreneurs as guest lecturers
- Promoting student visits and internships in start-ups and incubators
- Inviting entrepreneurs to mentor students considering entrepreneurship as a career choice
- Offering short courses to university graduates interested in starting up new businesses or transforming existing firms
- Including research commercialization lectures as part of the taught courses targeted at doctoral and post-doctoral researchers
- Enhancing the collaboration between academia and industry through industrial doctorate programs

### Life-long Learning:

- Enhancing existing entrepreneurship schemes (e.g., schemes targeted at young entrepreneurs) with requirements of attending courses on business management, financial management, marketing, and digital literacy
- Providing online courses to existing business owners on expanding business models and growing new businesses

### Culture and social norms:

- Enhancing media platforms with content relevant to entrepreneurship (e.g., pitching ideas to investors, entrepreneurs sharing their entrepreneurial journeys)
- Encouraging female entrepreneurs to mentor female students interested in entrepreneurship
- Utilizing social media platforms used by youngsters to advertise the benefits of entrepreneurship versus other career options

## GOVERNMENT PROCESSES & POLICIES

The 2021/2022 results demonstrate that from a government policy perspective, Cyprus offers adequate support to new and growing firms. This is also reflected by the fact that taxes are not considered as a burden for new and growing firms and that taxes and regulations are applied in a predictable and consistent way. Along the same lines, entrepreneurs can register a new business in Cyprus at reasonable cost. The above illustrate that the government considers entrepreneurship as a priority for policy at a national level. However, experts view that it is not a priority for policy at a local level. This is also reflected in the results, as

there is a limited number of affordable office spaces to rent for new and growing firms. The results also show that there is still bureaucracy, and that it requires over a week for new businesses to acquire the necessary permits and licenses. These limitations are aligned with the GEM Cyprus findings of the previous years, signaling the need for further improvement. This is also reflected in the ease of entry for new and growing businesses, as the results demonstrate that it is difficult for them to enter new markets without being unfairly blocked by established firms. The results show that the government mitigation regarding decline of new firms because of the pandemic has not been sufficient. Finally, the results demonstrate that support for female entrepreneurship has been limited, which is also aligned with the constantly imbalanced participation of the two genders in new entrepreneurial endeavors across the years. The GEM results lead to a set of recommendations regarding processes, policies and structures implemented from the government perspective:

### Government processes:

- Enhancing the Business Facilitation Unit<sup>1</sup> support to optimize operation and digitize all procedures for companies operating in Cyprus or international companies wishing to operate in Cyprus
- Implantation of digital governance in government services interacting with businesses and accelerating the digitalization of government services to eliminate bureaucracy
- Reducing the time required for new businesses to acquire the necessary permits and licenses

### Government policies:

- Enhancing the support offered to new and growing businesses and entrepreneurs at local level
- Boosting the offering of shared office spaces and hot desks for entrepreneurs and new businesses through incentives at local level
- Promoting the collaboration between academic and industry on knowledge transfer and exploitation of research
- Establishing policies to support new firms aiming to expand their businesses models and enter new markets

### Government structures & schemes:

- Developing support structures aimed at female entrepreneurs (e.g., discounted childcare, business support during maternity leaves)
- Implementing schemes to enhance research and development activities in existing businesses
- Creating schemes to incentivize industrial doctorate programs offered by Universities, secondments of researchers in industry and R&D employees from industry to academic and research centers

## FINANCIAL SUPPORT

The GEM 2021/2022 results demonstrate that there are sufficient government subsidies available for new and growing firms, while new and growing businesses can easily hire financial support services at reasonable cost. However, access to finance has been one of the most persistent burdens of

<sup>3</sup> <https://meci.gov.cy/en/departments-services/business-facilitation-unit-bfu>

Cyprus' entrepreneurial ecosystem. Across the years, the GEM results constantly demonstrate that it is difficult for new and growing firms to acquire different types of funding including equity funding, debt funding, informal investors funding, VC and business angel funding. Alongside the lack of access to finance, the framework condition associated with government programs offering support to firms has also decreased. These results demonstrate that there is a limited number of government programs for new and growing businesses, whereas the support of science parks and business incubators is not sufficient for the needs of new and growing firms. The availability of financial support is essential for the creation and growth of new businesses and thus the 2021/2022 GEM results urge the need for further enhancement of the financial resources available to entrepreneurs. Policy recommendations associated with financial support may include:

### Investors

- Enhancing tax incentives to encourage private individuals to invest in new businesses
- Promoting the networking and matchmaking between investors and entrepreneurs through frequent local events dedicated to this purpose
- Training local businesses and individual investors in Cyprus on investment options related to entrepreneurship and innovation
- Incentivizing existing businesses to become angel investors
- Generating tax incentive schemes dedicated to attracting angel investors and venture capital from international investors

### Government entrepreneurship programs:

- Offering different funding schemes dedicated to the growth of businesses at different stages (nascent, new businesses, established businesses)
- Enhancing entrepreneurship programs aimed at financially supporting the exchange of research and innovation staff to share knowledge and ideas between university and industry
- Enhancing tax reduction schemes on business activities of high-risk (e.g., proof-of-concept)

## BUSINESS SUPPORT

Physical Infrastructure and Commercial and Services Infrastructure facilitate new business development and growth in Cyprus. It is easy for new and growing firms to gain good access to communications as well as to high-quality consulting and professional services, while such services are perceived to be relatively affordable for new and growing firms. The results also indicated areas in which further improvement and business support is required. For example, new businesses cannot afford the latest technology. This is also supported by the APS funding, indicating that a very small percentage of nascent entrepreneurs or new businesses consider the technology or processes used as new to the world, while few consider their product or service as innovative. Aligned with these insights, are findings demonstrating that there are limited government subsidies for new and growing firms to acquire new technology and that



the creation of world-class new technology-based ventures is not sufficiently supported. These conclusions lead to policy recommendations which can improve the support available to new and growing businesses:

#### Technology enhancement:

- Developing a support unit dedicated to connecting businesses seeking to acquire cutting edge technologies in their field with relevant academic groups and research centers
- Supporting digital transformation for new and established businesses through schemes dedicated to technology enhancement, digitalization, and ICT consulting
- Incentivizing the purchasing of latest technologies by new and growing firms at discounted prices (e.g., cutting-edge technology coupons)
- Provisioning of access to ICT for new and growing firms at lower prices (e.g., access to computational power)

#### Supportive Environment:

- Establishing a publicly available registry of subcontractors, consultants, lawyers and accountants offering services to startup companies at lower/fixed rates
- Developing public co-working spaces dedicated to new entrepreneurs offered a discounted price
- Maintaining an updated a national registry for start-up businesses which will collect data on startup performance, achievements and needs through a structured and frequent methodology

#### Extroversion:

- Enhancing flight connections to destinations featuring as leading technology hubs, entrepreneurship and innovation centers, and technology and research parks
- Developing schemes to match entrepreneurs seeking advice on expanding to international markets with successful entrepreneurs of the Cypriot diaspora
- Promoting the collaboration between local entrepreneurial ecosystems and entrepreneurial ecosystems in other countries with long tradition in entrepreneurship
- Support entrepreneurs in Cyprus to visit other entrepreneurial ecosystems of the region (e.g., Israel) aiming for exchange of know-how and development of synergies



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## SPONSORS

Ministry of Energy, Commerce and Industry  
PwC Cyprus

## ACKNOWLEDGEMENTS

Constantinos Georgiou, Ministry of Education

Kalypso Apergi, Cyprus Pedagogical Institute

Anayiotos Andreas, Cyprus University of Technology

Antanakoudi Anixi, The Cyprus Institute

Christou Elpida, University of Cyprus

Constantinou Anastasia, University of Cyprus

Nicolaidis Christos, Department of Business Administration, University of Cyprus

Eliades Dimitris, KIOS Research and Innovation Center of Excellence

Evgeniou Maria, IDEA

Evgeniou Ioannis, Fooderloo

Georgiou Giorgos, NOVATEX SOLUTIONS LTD

Georgiades Kalina, KIOS Center of Excellence – Teaming, University of Cyprus

Giorgoudis Marios, Deputy Ministry of Research, Innovation and Digital Policy

Hadjichristodoulou Celia, GrantXpert Consulting Ltd

Hadjiyerou Maria, INVEST CYPRUS

Ioannidou Monica, MAP Innovation

Ioannou Constantina, PwC

Kofteros Stavriana, StartupCyprus

Komodiki Antigoni, Junior Achievement Cyprus

Kouloumbri Maria, IDEA

Larkou George, IMPACT TECH LTD

Loucaidou Eliza, Deloitte

Menelaou Menelaos, Youth Board of Cyprus

Michael Loizides, ISOTECH LTD

Michaelides Alexandros, RTD Talos LTD

Onoufriou Alexis, Frederick University

Poutziouris Panikkos, University of Central Lancashire Cyprus

Savva Nikolas, Active Hub

Solomonides Andrea, Giraffes in the Kitchen

Sourianos Daniil, KPMG, TraCar LTD

Terzi Maria, Malloc LTD

Theodorou Maria, Ministry of Energy, Commerce and Industry

Tirkides Ioannis, Bank of Cyprus

Tourvas Teresa, University of Cyprus

Trillidou Marcia, Research & Innovation Foundation

Tsakalos Vassilis, The Cyprus Institute

Tsiakkas Maria, Tsiakkastel Office Line Ltd

Zenonos Zenonas, Neapolis University





# ERATOSTHENES CENTRE OF EXCELLENCE IS PAVING THE WAY FOR CYPRUS TO ENTER THE SPACE ARENA

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## INTRODUCTION

A new, autonomous, and self-sustained Centre of Excellence, namely [ERATOSTHENES Centre of Excellence \(www.ERATOSTHENES.org.cy\)](http://www.ERATOSTHENES.org.cy) of the [Cyprus University of Technology \(CUT\) \(www.cut.ac.cy\)](http://www.cut.ac.cy) has been established through the 'EXCELSIOR', H2020 Widespread Teaming Phase 2 project ([www.excelsior2020.eu](http://www.excelsior2020.eu)). The newly established centre has been created as a result of upgrading the existing Remote Sensing and Geo-Environment Lab, which has been operating within the [Department of Civil Engineering and Geomatics](#) of the Cyprus University of Technology since 2007. The ERATOSTHENES Centre of Excellence is located in Limassol, Cyprus, with supporting infrastructures in other coastal Municipalities in Cyprus.

The integration of novel Earth Observation, space and ground-based integrated Technologies can contribute to a more sustainable and systematic monitoring of the environment, the growth of vital economic sectors and the timely detection, monitoring and analysis of natural and anthropogenic threats. The ERATOSTHENES Centre of Excellence is focused on excellence in multidisciplinary Earth observation research towards a better understanding, monitoring and sustainable exploitation and protection of the physical, built and human environment, in line with international policy frameworks, with a regional focus in the Eastern Mediterranean, Middle East and North Africa (EMENA), positioning itself as an innovation gateway for Cypriot, regional and European stakeholders.

The mission of the ERATOSTHENES Centre of Excellence is to conduct both basic and applied research towards improved understanding, management, and monitoring of natural resources and infrastructures and to offer expert services and products of excellent qualities in line with the latest-developed remote sensing and related geospatial technologies or other high-tech tools. The vision of the ERATOSTHENES Centre of Excellence is to become a world-class Digital Innovation Hub for Earth Observation, space technology and Geospatial Information and to be the reference Centre in the Eastern Mediterranean, Middle East, and North Africa regions.

The ERATOSTHENES Centre of Excellence works closely with the strategic partners of the EXCELSIOR project, which

include the Cyprus University of Technology, the German Aerospace Centre (Germany), the National Observatory of Athens (Greece), the German Leibniz Institute for Tropospheric Research (Germany) and the Deputy Ministry of Research, Innovation and Digital Policy (Cyprus), to strategically engage Cyprus in a path of innovative growth in newly developed capabilities.

## Digital Innovation Hub

The ERATOSTHENES Centre of Excellence is dedicated to the creation of a fully functional [Digital Innovation Hub](#) and a Research Excellence Centre for Earth observation in the EMENA region, creating an ecosystem where state-of-the-art sensing equipment, cutting-edge research, targeted education services and entrepreneurship all come together. The ERATOSTHENES Centre of Excellence adopts a Multi-Actor approach, where stakeholders participate in the co-design, co-creation, commercialisation and promotion of novel remote sensing products and services.

The Digital Innovation Hub consists of four value-adding chains and three thematic clusters/ departments within a two-axis model. The three thematic clusters/departments include:

[Environment & Climate](#) which exploits state-of-the-art infrastructure and Earth observation data for aerosol and cloud monitoring as well as developing a supersite for calibration/validation activities.

[Resilient Society](#) focuses on research and services that are applicable to the general public, with a primary focus on Disaster Risk Reduction and Access to Energy.

[Big Earth Data Analytics](#) is designed to allow the discovery of new information that is hidden in the data and promote the value-adding combination with non-Earth observation data streams.

A few examples of these projects are presented in the next pages.

The four value-adding areas of the Digital Innovation Hub include **Infrastructure**, **Research**, **Education** and **Entrepreneurship**.

The **Infrastructure Area** is responsible for the seamless use of the existing and future ERATOSTHENES Centre of Excellence infrastructure, their proper operations and the unobstructed access to Earth observation data by the ERATOSTHENES Centre of Excellence staff and stakeholders. It will include state-of-the-art infrastructure, including the **Ground-based atmospheric remote sensing station, which is a supersite for aerosol and cloud monitoring as well as the Satellite data direct receiving station that will be able to directly receive image-based satellite data from Earth observation satellite missions**, which will allow Near Real Time monitoring and thereby provide time-critical information, especially in the Eastern Europe, Northern Africa and Middle East regions.

The **Research Area** is responsible for the development of science and research that lead into the development of ERATOSTHENES Centre of Excellence services. The high

quality and innovative research is expected to significantly impact not only on the scientific community but also stakeholders, policymakers and the general public.

The **Education Area** focuses on developing critical skills in Earth observation through activities such as the MSc & PhDs hosting programme, a Skills Development Centre and a Professional Training Programme.

The **Entrepreneurship Area** is responsible for ensuring the sustainability of the ERATOSTHENES Centre of Excellence and stimulating national and regional growth through the exploitation of the IPR, licensing of innovation and market uptake of new Earth observation-based products, and services and solutions generated by the ERATOSTHENES Centre of Excellence and the Strategic Partners.

The Centre is dedicated to developing an entrepreneurial mentality within the Space-related research areas to connect with industry through its networking and knowledge hub.



## Entrepreneurship Development

The ERATOSTHENES Centre of Excellence considers innovation as the key and core aspect that ensures the sustainability of the Centre and contributes to the national, regional and European prosperity in economic, social and environmental terms. Therefore, the Centre is dedicated to supporting the development of innovative start-ups in the Earth Observation field and cultivating the Space Technology ecosystem in Cyprus as well as in the Eastern Mediterranean, Middle East and North Africa regions through incubation and acceleration services. The Centre will be launching a Space BIC program that will aim to promote, stimulate and develop innovative start-ups through the delivery of effective incubation processes, with the goal of contributing to the development of novel space technologies and applications and in general to the growth of the Space start-up ecosystem in Cyprus with the goal of ultimately contributing to regional/local economic development. The program will support entrepreneurs with the ambition of exploiting space technology applications and systems. In addition, the Centre is active in developing an entrepreneurial mindset in researchers through targeted trainings, so that research activities can lead to innovative Earth observation applications, technologies and services. The Office of Innovation of ERATOSTHENES Centre of Excellence (InECoE) was hence established, to provide the administrative infrastructure for the procedures for IPR development for all ECoE researchers and staff, with regards to the exploitation of our research results. Moreover, the Living Labs Program has been developed to advance excellence in Earth observation and encourage collaboration between scientists. This Program combines network activities with research infrastructure and network for collaboration, so as to provide services for the benefit of society and economy.

## Network and Knowledge Hub

The ERATOSTHENES Centre of Excellence aims to strengthen the interaction between scientific researchers and local as well as broader EMMENA region stakeholders through the Networking & Knowledge Hub, with the objective of fostering the cross-fertilisation of ideas and uptake of ERATOSTHENES Centre of Excellence's research and innovation output. This will be accomplished through the networking platform, in order to foster stakeholder registration and interaction in an organised way. The end-users will be able to network with other researchers with complementary expertise, promote their institutes and enhance communication and visibility, make common research efforts, facilitate the transfer of knowledge and data sharing, and exchange knowledge.

## Research Activities

The ERATOSTHENES Centre of Excellence is currently involved in several research projects which utilize Earth observation to provide benefit to the public. Some of the research projects are described below:

## 1. AGREEMAR: Adaptive agreements on benefits sharing for managed aquifer recharge in the Mediterranean region

The availability of water resources in Mediterranean countries is characterized by uneven spatio-temporal distribution and is heavily affected by agricultural intensification necessity to sustain the rapid population growth and extensive tourism in coastal areas. The AGREEMAR project proposes an integrated and coordinated methodology to assess and map the feasibility of managed aquifer recharge (MAR) in the Mediterranean basin and safeguard its success through the implementation of an adaptive governance framework. AGREEMAR's mission is to contribute to water scarcity alleviation in the Mediterranean basin, by increasing the water availability at a national/regional/basin level. This will be achieved by an improved and integrated management of the water cycle, including water reuse, centred on optimizing the water storage in aquifers. The long-term aim of AGREEMAR is to optimize the hydrological balance in Mediterranean countries by developing governance models, management strategies, cost-benefits analyses, technical specifications and simulation tools to optimize the water storage in aquifers, enabling increased resilience to climate change. The project is funded under the Partnership for Research and Innovation in the Mediterranean Area (PRIMA), an EU Horizon2020 initiative sponsoring projects that contribute to the sustainable use of natural resources, economic growth and stability in the Mediterranean region. The AGREEMAR consortium includes: Technische Universität Dresden (Germany), Laboratório Nacional de Engenharia Civil (Portugal), ERATOSTHENES Centre of Excellence (Cyprus), Adelphi Research GmbH (Germany), Universitat Politècnica de València (Spain) and the National Institute of Agronomy, University of Carthage (Tunisia). The ERATOSTHENES Centre of Excellence leads the activities associated with the compilation of a comprehensive matrix of potential suitability indicators, by considering a multitude of biophysical, technological, social, economic, environmental, hydrological, institutional and financial parameters. The ERATOSTHENES Centre of Excellence will also develop a weighting system that displays the relevance of each feasibility indicator for each stakeholder cluster, which will be used during a multi-criteria decision analysis.

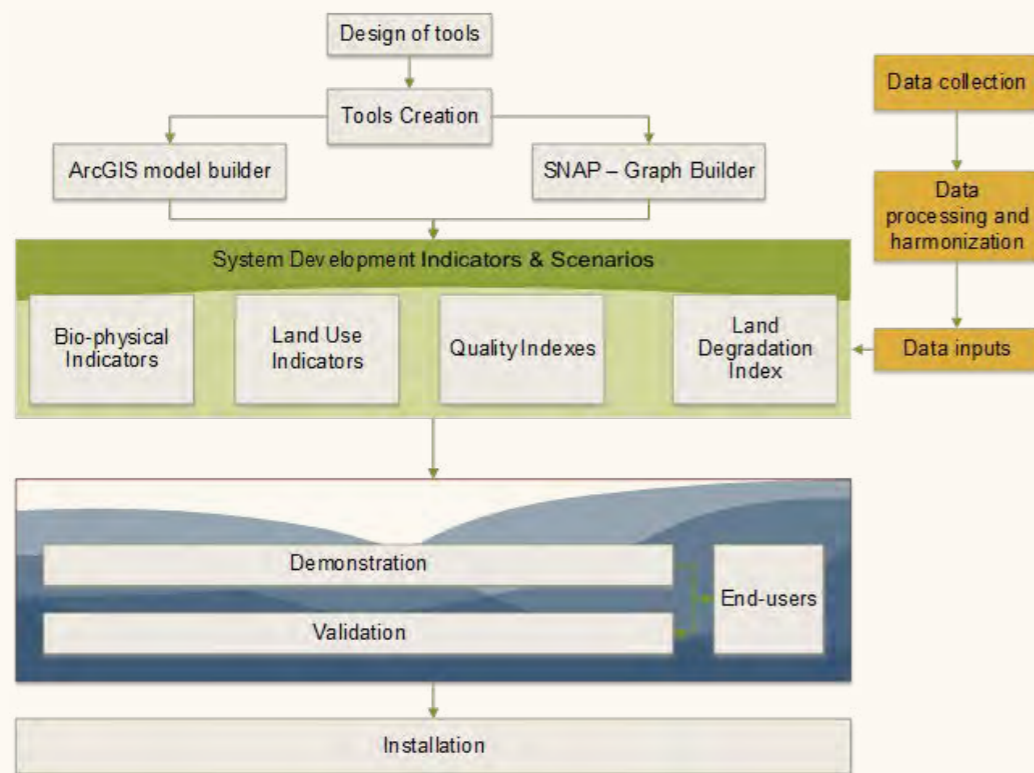


## 2. EDAFOS: Development and testing of desertification risk and pressures mapping and Assessment tool

The EDAFOS project, funded by the European Space Agency (ESA), aims to develop a system that can facilitate desertification risk mapping and the analysis of individual parameters contributing to desertification to support monitoring, reporting and development of measures to combat desertification through scenario analysis. The EDAFOS project will prepare through data collection (e.g., Land use, Meteorology, Human activities, Population, and Geophysical parameters), processing and interpretation methodology of a Geographical Information System (GIS) tool for the assessment of desertification and land degradation risk. In addition, it will provide scenario analysis for developing policies and measures to reduce risk and mitigate associated environmental and socioeconomic impacts. The EDAFOS Toolbox will support National Competent Authorities in the implementation of the

desertification directive, and in particular, it will enable the in-depth analysis of human-induced and natural pressures and facilitate the design of measures for combating desertification and land degradation. The project is coordinated by ATLANTIS Environment and Innovation Ltd and is implemented in collaboration with the ERATOSTHENES Centre of Excellence and the Department of Environment.

In the framework of the EDAFOS project, the ERATOSTHENES Centre of Excellence is responsible for the development of mechanisms to prepare required data sets for the final system implementation. In particular, the ERATOSTHENES Centre of Excellence will define data acquisition and processing Tools for data not readily available from existing maps or Earth observation products. Furthermore, the ERATOSTHENES Centre of Excellence will provide training to ATLANTIS Environment and innovation Ltd and the Department of Environment for using the platform and associated Tools.



## 3. AI-OBSERVER: Enhancing Earth Observation capabilities of the ERATOSTHENES Centre of Excellence on Disaster Risk Reduction through Artificial Intelligence

The AI-OBSERVER project aims to significantly strengthen and stimulate the scientific excellence and innovation capacity, as well as the research management and administrative skills of the ERATOSTHENES Centre of Excellence, through several capacity-building activities on Artificial Intelligence for Earth Observation applications in the Disaster Risk Reduction thematic area of the ERATOSTHENES Centre of Excellence, upgrading its current Resilient Society Department, and its Research Management and Administration Departments, and assisting the ERATOSTHENES Centre of Excellence to reach

its long-term objective of raised excellence on AI for Earth observation on environmental hazards. All project outputs will be disseminated and communicated to stakeholders, the research community, the industry and the public in Cyprus and beyond, creating strong links that the ERATOSTHENES Centre of Excellence will capitalise on, long after the end of the project.

The project is funded in the framework of the Horizon Europe call: HORIZON-WIDERA-2021-ACCESS-03 (Twinning), and its consortium consists of the ERATOSTHENES Centre of Excellence (Cyprus), the German Research Centre for Artificial Intelligence (Germany), the University of Rome Tor Vergata (Italy) and CELLOCK Ltd (Cyprus).

## 4. ENGINEER: Civil Engineering and Geomatics innovative research on Heritage

The ENGINEER project aims to enhance the Department of Civil Engineering and Geomatics of the Cyprus University of Technology (CUT) research and innovation potentials through coordination and support actions provided by the Twinning call. Build upon its unique character, as the single University Department of the country, where civil and geomatics engineers come together, the Twinning project will fulfil and expand inter-departmental research activities in cultural heritage. The proposal vision is to fill research gaps and extend knowledge into new innovative fields dealing with the monitoring, digitisation, visualization and preservation of cultural heritage, assisting towards their protection, promotion and safeguarding.

The project is funded under Horizon Europe HORIZON-WIDERA-2021-ACCESS-03 (Twinning). The consortium includes the ERATOSTHENES Centre of Excellence, CYPRUS, the Polytechnic University of Milan (Italy), the University of Aveiro (Portugal) and University College London (UK). The consortium members will work closely with the ERATOSTHENES Centre of Excellence through training research activities, mobility actions, networking and in-situ pilot applications. At the same time, the project will advance research management, administrative skills and promote industrial and knowledge transfer, thus reforming the Department's R&I system. The participation of the ERATOSTHENES Centre of Excellence will multiply the potential impact of the project, creating strong links with partners of the quadruple helix of the smart specialization, and will support commercialization and marketed aspects.

## 5. CARBONICA: Carbon Initiative for Climate-resilient Agriculture

The continuous increase of the scope and the scale of the anthropogenic activities in which agriculture plays a significant role, contributes to a rapid negative impact on the carbon cycle. The widening countries involved in this project, Cyprus, Greece and North Macedonia, as part of the Balkan-Mediterranean region, are heavily impacted by climate change. The main objective of this project is to establish the CARBONICA Excellence Hub by connecting the innovation ecosystems of Cyprus, Greece and North Macedonia while enhancing their TRL as service providers, based on cutting-edge technologies (Earth Observation; in situ data; digital agriculture etc.) in carbon farming. The main scope is to establish access to excellence to all relevant stakeholders, as well as strengthen regional innovation capacity guided by long-term joint R&I strategy in the carbon farming field. To achieve these targets, an inter- and transdisciplinary approach is required to integrate the expertise and knowledge of all relevant stakeholders and a place-based perspective and design needs-based carbon farming solutions, as well as strict policies to foster shifts towards a Climate-resilient Agriculture.

The project is funded under the Horizon Europe's call: HORIZON-WIDERA-2022-ACCESS-04 (Excellence Hubs). The ERATOSTHENES Centre of Excellence will act as the coordinator of the Cyprus Innovation ecosystem, which includes the Agricultural Research Institute (Ministry of Agriculture, Rural Development and Environment), the Cyprus University of Technology, CELLOCK Ltd. and the Panagrotikos Association of Cyprus. All partners will offer their expertise on remote sensing and ground-based techniques for agriculture.

# AI OBSERVER

3. AI-OBSERVER



4. ENGINEER



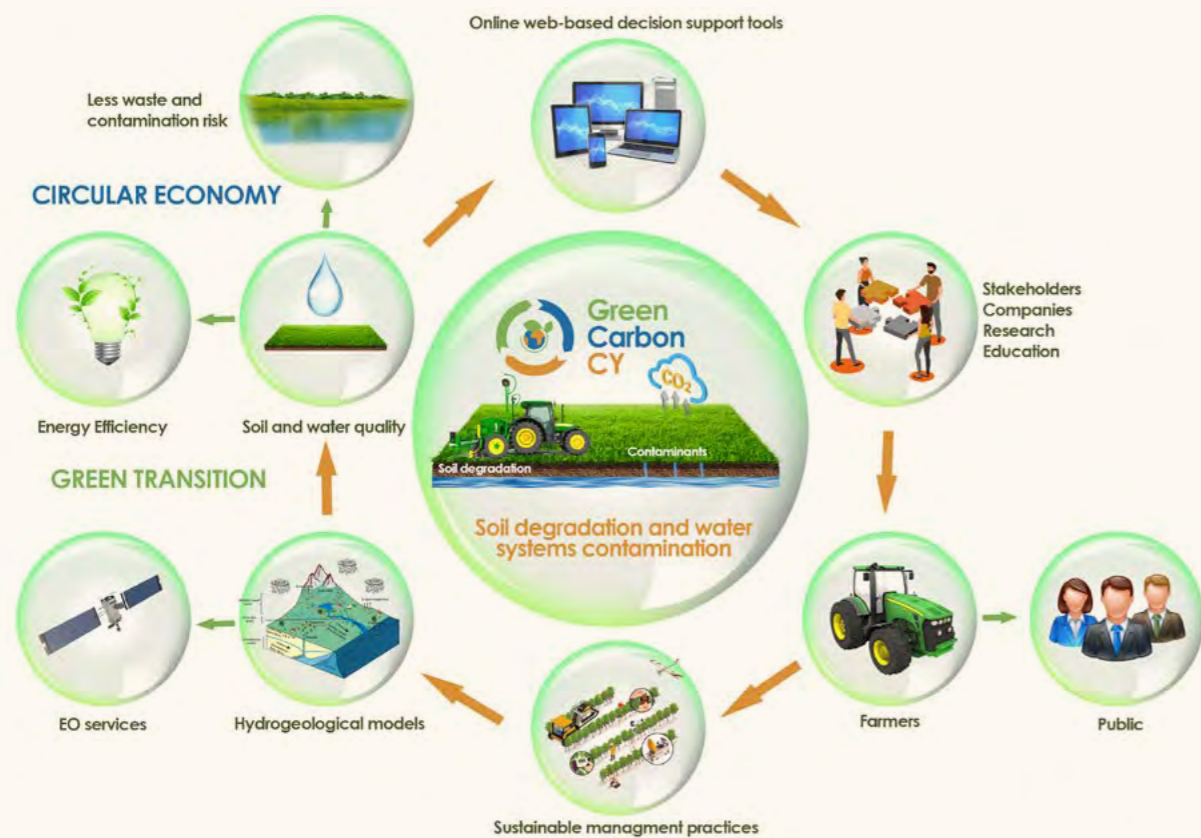
5. CARBONICA

## 6. GreenCarbonCY: Transitioning to Green agriculture by assessing and mitigating Carbon emissions from agricultural soils in Cyprus

The GreenCarbonCY project aims to develop an integrated and web-based decision support tool for soil health restoration, land management and greenhouse gas emissions control by utilizing Earth observation data and products of the Copernicus Climate Change Service hydrogeological models. The project will develop an integrated and participative methodology to assess and map the vulnerability of soil health to climate change and human activities in alignment with the principles of land and water management. The resulting information system will act as a bridge between scientists and stakeholders for revising and adapting land management. The project will

foster intercultural and multidisciplinary collaboration and transfer between countries. The developed solutions are expected to fulfil optimal land and water provisions for food security, agro-economic systems, domestic services, and the preservation of natural ecosystems in Cyprus.

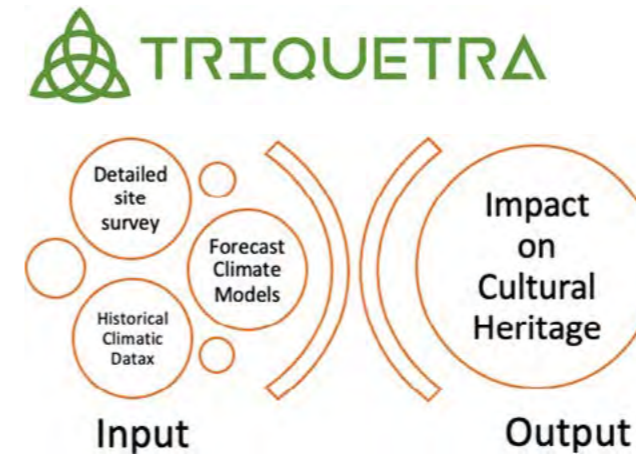
The project (CODEVELOP-GT/0322/0023) is funded under the RESTART 2016–2020 Programme CO-DEVELOP of the Research and Innovation Foundation. The ERATOSTHENES Centre leads the specific project, with CELLOCK Ltd and the Agricultural Research Institute of the Ministry of Agriculture, Rural Development and Environment being the Cypriot partners, whereas the InterBalkan Environment Center from Greece and Green Growth Platform from North Macedonia will offer their expertise as Foreign Research Organisations.



## 7. TRIQUETRA: Assessing and mitigating Climate Change risks and natural hazards threatening cultural heritage monuments

The TRIQUETRA project aims at creating an evidence-based assessment platform that allows precise risk stratification and creates a database of available mitigation measures and strategies, acting as a Decision Support Tool towards efficient risk mitigation and site remediation. The project focuses on risk identification, risk quantification and risk mitigation, thereby creating a framework for risk assessment and risk mitigation. The project proposes a technological toolbox and methodological framework for tackling climate change risks and natural hazards threatening cultural heritage in the most efficient way possible.

The TRIQUETRA project is funded under the Horizon Europe call HORIZON-CL2-2022-HERITAGE-01/ and the consortium consists of 21 partners from Greece, Cyprus, Germany, Italy, Poland, Austria and Switzerland. The ERATOSTHENES Centre of Excellence will use their experience in Earth observation using Synthetic Aperture Radar (SAR) to monitor micromovements in the Choroikoitia cultural heritage site as well as Augmented Reality and 3D modelling to create a citizen engagement framework and enable crowdsourced site monitoring, as well as help define and inform the novel in-situ and remote sensing systems specifications.



7. TRIQUETRA

## 8. ENIGMA: Endorsing safeguarding, protection, and provenance management of Cultural Heritage

The ENIGMA project aims to achieve excellence in the protection of cultural goods and artefacts from man-made threats by contributing to the identification, traceability, and provenance research of cultural goods as well as by safeguarding and monitoring endangered heritage sites. The objectives of the ENIGMA project include how to assist the involved stakeholders better respond to this complex and multi-

dimensional problem, leverage active collaboration by fostering and enabling the interlinking of databases, and evidence-based deployment of preventative measures.

The ENIGMA project is funded under the Horizon Europe call: HORIZON-CL2-2022-HERITAGE-01 with a consortium of 12 partners from Greece, Cyprus, Finland, Belgium, Malta, Switzerland and Spain. The ERATOSTHENES Centre of Excellence will be mainly involved in the monitoring of looting activity in CH sites.



## Social Responsibility

The ERATOSTHENES Centre of Excellence is dedicated to social responsibility, which is accomplished by awareness, interaction, involvement and engagement with the public and stakeholders. The objective of the activities is to inform and engage with the wider public regarding the beneficial impact of the conducted research on the environment, society and the economy. The ERATOSTHENES Centre of Excellence is active in social responsibilities, especially in the areas of climate change, natural and built environment, environmental protection, disaster management and cultural heritage, among others. Several activities include the digitization of archaeological sites and churches as well as environmental monitoring and protection using Earth observation and remote sensing techniques, including drones, ground penetrating radar, Geographical Information Systems, etc.

## CONCLUSION

The ERATOSTHENES Centre of Excellence is focused on establishing a state-of-the-art institution in the Earth observation sector that is dedicated to collaborating with the industry, society, academia and Government in common projects, proposals, networks, initiatives, etc., so as to provide a more effective framework where Earth observation can be used to provide vital information for decision-making and quality of life. The ERATOSTHENES Centre of Excellence foresees innovation as the key and core aspect for ensuring the sustainability of the Centre and its contribution to the National, regional and European prosperity with respect to economy, society and the environment.

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## ATTRIBUTION

Polyviou, A., Markopoulos, P.V.M. & Savvides, C.. (2023)  
Entrepreneurship in Cyprus: National Report 2021/2022,  
C4E-Rep-2023-01 (published by the University of Cyprus, 2023)

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## MORE INFORMATION

For more information on GEM Cyprus, please visit  
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ISSN 2547-8532 (print)  
ISSN 2547-8540 (online)  
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