GLOBAL
ENTREPRENEURSHIP
MONITOR

GLOBAL ENTREPRENEURSHIP MONITOR (GEM)

CYPRUS REPORT 2020/2021

GUEST SECTION

ART, CULTURE, SCIENCE AND TECHNOLOGY
AT CYENS CENTRE OF EXCELLENCE

University of Cyprus

C4E
CENTRE FOR ENTREPRENEURSHIP

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FOREFRONT FROM THE CHAIRMAN OF ENTREPRENEURSHIP COUNCIL, UNIVERSITY OF CYPRUS

For the fifth consecutive year, the Centre for Entrepreneurship (C4E) of the University of Cyprus is the National Coordinator and the representative in the Global Entrepreneurship Monitor (GEM).

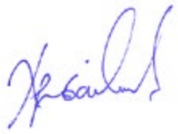
We are honored to represent Cyprus in the GEM consortium and lead the preparation of our national report on entrepreneurship, as part of the founding mission of the Centre for Entrepreneurship: to promote entrepreneurial culture and to support the creation of a sustainable entrepreneurial ecosystem.

Our long-lasting participation in GEM enables us to draw on longitudinal data and report on the status of entrepreneurship in Cyprus and the country's entrepreneurial ecosystem, while we are also able to compare the country's indexes with those of other countries. This leads to valuable policy recommendations for elevating and expanding the country's entrepreneurial landscape.

The report reflects on the results of two surveys; the Adult Population Survey and National Expert Survey which have been conducted under the guidance and support of the GEM Data Team. Given the unusual circumstances of the COVID-19 pandemic and its impact on society and economy, this year's report also reflects on the pandemic and its impact on the island's entrepreneurial activity.

I would like to convey the institution's sincere appreciation and gratitude to the Ministry of Energy, Commerce, and Industry for their valuable contribution to the successful development and completion for this year's GEM national report, as well as their continuous support during the last five years. Needless to say, Cyprus' participation in GEM marks Cyprus on the global map of entrepreneurship.

I hope that the report's insights will contribute to the growth of the entrepreneurial ecosystem, will help guide our national strategy towards entrepreneurship and inform relevant policies.



Professor Yiorgos Chrysanthou
Chairman (2018-to date)
Entrepreneurship Council

FOREWORD BY THE MINISTER OF ENERGY, COMMERCE AND INDUSTRY

Cyprus is moving into a new economic era, one where emphasis during policy formulation and implementation is on achieving our ambitious sustainability, circularity and cleaner energy goals. In this context, the Government recognises entrepreneurship as one of the main drivers of job creation and acceleration of economic activity, with knowledge-based growth, technological upgrading and innovation contributing to a strong and competitive economy.

At the same time, prevailing market conditions dictate 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 challenge for the Government is to provide our ambitious business community with all the tools and support required for the successful development of their entrepreneurial activities.

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. For all their excellent work in this regard, I take this opportunity to express my gratitude to the University of Cyprus and, in particular, our National Coordinator for GEM, the Unit of Entrepreneurship.

Rest assured that the Government is committed to taking into consideration the results and policy recommendations of the 5th 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

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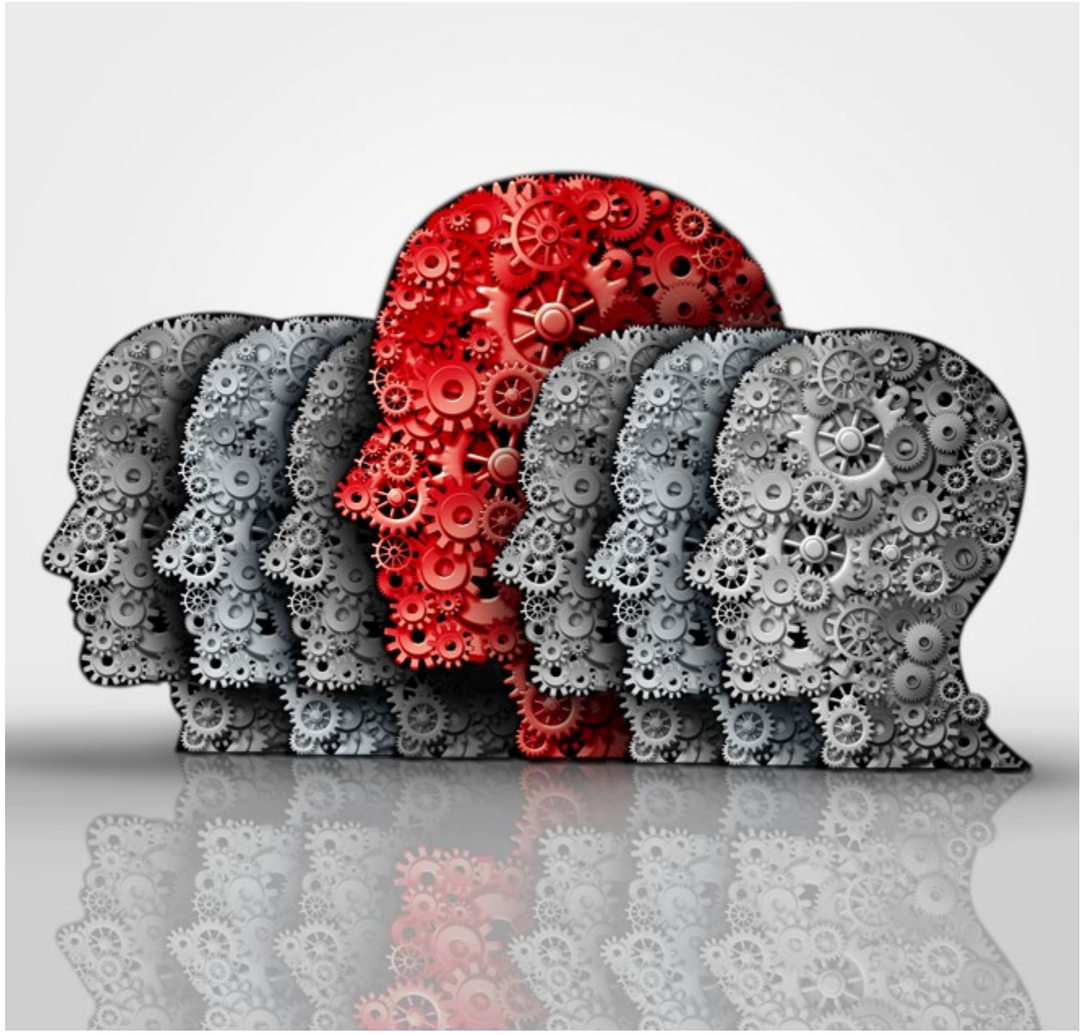
The COVID-19 pandemic brought enormous global challenges, which affected every aspect of the economy and society. In Cyprus, the measures to contain the spread of COVID-19 led to business and school closures, travel restrictions and supply chain disruptions. Cyprus' government reacted quickly, by providing relief packages to respond to the economic impact such measures had on businesses and their employees. Beyond its negative consequences however, the pandemic also gave rise to opportunities for reflection on the pertinent role of entrepreneurship in identifying innovative solutions to complex, local and global problems. This creates a pressing need for an evidence-based assessment of the pandemic's impacts on entrepreneurial activity in Cyprus as well as on its impact on societal attitudes, ambitions and entrepreneurial ecosystem conditions. Looking more closely at the country's entrepreneurial landscape during the pandemic outbreak can highlight potential avenues for economic and social recovery.

The findings of the Global Entrepreneurship Monitor (GEM) 2020/21 arise from a sample of nearly 140,000 adults from 46 economies, and includes both the Adult Population Survey and National Expert Survey. GEM collects data on the levels of entrepreneurial motivation and activity across the globe, providing in this way the world's first evidence-based assessment of the impacts of COVID-19 on entrepreneurship. Since 1999, the GEM consortium has been actively collecting data and evaluating the degree of entrepreneurial activity worldwide. GEM's conceptual framework contains a comprehensive 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 characteristics, status and expected impact of entrepreneurial activity and also the conditions of each country's entrepreneurial ecosystem. GEM's framework is thus well positioned to assess the status of entrepreneurial activity in each country.

GEM INTRODUCTION AND BACKGROUND



Cyprus' participation in GEM allows for deeper understanding and better conceptualization of entrepreneurship and innovation in the country. This is the fifth successive year Cyprus participates in GEM, which enables the longitudinal analysis of the evolution of the local entrepreneurial ecosystem. The consistency of the results across the years provide an unparalleled evidence base for the careful and measured assessment of how the pandemic has influenced entrepreneurial attitudes, motivation and activity, and on the impact of the relief packages of Cyprus' government. To grasp the impact of the pandemic, and other factors, on Cyprus' key entrepreneurial indexes, this report presents the data of the last three years. Additionally, to better inform the country's entrepreneurial status, this year's report also compares Cyprus' index rates to Greece's and Luxembourg's as well as to the European average rates.

GEM Cyprus 2020/21 highlights the island's entrepreneurial activity, including the impact of the pandemic. On the positive side, 54.8% of the population indicated no substantial change in their income due to the pandemic. 49.7% of the population perceive that it is easy to start a business, whereas 68.1% noted that they personally know an entrepreneur. Also, 29.2% of the population stated that they know someone who has started a business due to the pandemic. These index rates have increased compared to the previous year. However, the pandemic has contributed to less optimistic outlooks on entrepreneurship by the society. In particular, 38.5% of the population know someone who has stopped a business due to the pandemic, whereas only 21.1% of Cypriots perceive that there are good opportunities to start a business in their area. This last index rate is notably lower compared to the previous year. Such results may be linked to evidence noting that 17.1% of the population experienced a strong decrease in their income during this time.

Although insights, attitudes and perceptions of the population indirectly influence intentions towards entrepreneurship, data on actual entrepreneurial activity can provide useful insights on the current level of entrepreneurial activity and its expected impact on economy and society. Cyprus' Total Early-stage Entrepreneurial Activity (TEA) index rate has been 8.6% in 2020/2021, which is notably lower compared to 12.2% in 2019/2020. The reduction of TEA index is more associated with the reduction of nascent entrepreneurship in Cyprus (5.1% in 2020/2021, down from 7.9% in 2019/2020) rather than new business ownership (3.6% in 2020/2021, down from 4.6% in 2019/2020). The rate of established business ownership in Cyprus is 7.3% and employee entrepreneurial activity rate is 6.0%. The ratio of female to male TEA involvement in Cyprus is 0.6, which has been consistent across all five years in which Cyprus has been participating in GEM. Reflecting on the impact of the pandemic, although 42.1% of TEA in Cyprus believe that starting a business is somewhat or much more difficult compared to a year ago, this rate is notably lower compared to the EU average rate (49.5%) and the countries used as benchmarks (Greece 75.5%, Luxembourg, 58.6%).

The National Expert Survey (NES) highlighted that entrepreneurs in Cyprus have been very responsive to the consequences of the pandemic. Compared to 17 other countries in the European regional area, Cypriot entrepreneurs rate 3rd in terms of their proactiveness. Experts also highly appreciate the government's responsiveness to the economic impact of the pandemic. Based on their rating, the proactiveness of the Cyprus government again holds the 3rd position across the 17 countries under the European regional area. Cyprus' entrepreneurship ecosystem benefits from its high-quality physical infrastructure which acts as a facilitator of the country's entrepreneurial ecosystem. Commercial & Legal Infrastructure and Government Policy on Taxes & Bureaucracy are also strengths of the ecosystem. However, the results also highlight opportunities for improvement, including Entrepreneurial Education, Entrepreneurial Finance, R&D Transfer and Cultural and Social Norms.

Despite the consequences of the pandemic and the expected reduction on TEA and other GEM indexes, compared to other European countries, Cyprus' entrepreneurial landscape has been resilient and proactive. According to the expert views, this is related to responsiveness of both the entrepreneurs and the government. Perceptions on the ease to start a business have improved compared to the previous year. An increasing number of individuals state that they personally know an entrepreneur which could possibly contribute to a more in-depth understanding the social benefits of entrepreneurship. GEM 2020/2021 also sheds light on some of the weaknesses of the entrepreneurial ecosystem. The results underline the need for policy action at a financial, cultural and educational level. Entrepreneurs in Cyprus have constantly struggled, across the years, to get access to investors and sufficient financial resources. Entrepreneurial education lacks a holistic strategy that will assist students at all levels to develop the skills necessary in order to pursue successful entrepreneurial endeavors. Also, the lack of targeted entrepreneurship and other supportive mechanisms widen the gender gap in entrepreneurial activity.

Post-Covid entrepreneurship is expected to play a key role in a worldwide economic recovery. New entrepreneurs are the driving force of job and income creation, contributing in this way to economic development and societal transformation. During the pandemic era, both entrepreneurs, as well as the Cyprus government, focused on sustaining businesses. While this report goes to press, we are transitioning from the pandemic to the post-pandemic era. Entrepreneurs and the government need to take further action in order to facilitate speed in business recovery and growth. Orchestrating the different government initiatives, enhancing existing entrepreneurship programs, and incentivizing and training investors are some of the policy. Finally, this year's recommendations included in the report towards this direction. In this year's special section, we draw our focus on the CyEns Centre of Excellence as an example of how the research, industry and public sector stakeholders can collaborate to better support entrepreneurship and innovation in the country. We aspire that the 2020/2021 GEM results will further inspire the key stakeholders of our ecosystem.

Global Entrepreneurship Monitor (GEM) is the biggest and longest-standing study of entrepreneurs and entrepreneurial approaches in the world. GEM defines entrepreneurship as the step of initiating and forming a new business. The 2021/2021 GEM marks the 23rd GEM Global Report, displaying the continuous research efforts in 46 different economies, comprising of different levels of economic development and geographical regions. This report provides insights on the status of entrepreneurship across the world. Every economy participating in GEM collected consistent and validated data in alignment with the GEM methodology. The 46 economies participating in this year's GEM are illustrated in Figure 2.1 The GEM methodology allows the comparison across different national economies as well as across the years for economies participating for multiple years. Following an identical approach for data collection and validation enables GEM to have adequate and representative data throughout the years. In 2020, GEM was adjusted in the light of the growing and unstable changes that appear, caused by the COVID-19 pandemic. The COVID-19 pandemic and its effects on entrepreneurship form a unique feature on this year's Global Report, as a careful assessment and measurement of its impacts are seen and examined relating to entrepreneurial activity across the globe. This year's report reflects the start of a new, long road: first of impact and then, hopefully, of economic recovery.

Entrepreneurship can be the vehicle through which new opportunities will open up, based on creativity and innovation. It can play a catalytic role by opening up job positions, finding solutions to challenging global problems (such as health and safety-related issues, environmental issues and the need to provide more inclusive, diverse and flexible workplaces). All these can unlock a potential for growth, mitigate poverty, which is currently exhibited at increasing levels worldwide, and thus support sustainable economic development. Without a doubt, entrepreneurial activity is essential and important to all economies, even more so during and after a pandemic. Difficult as the COVID-19 pandemic continues to be, recovery may bring new opportunities and challenges. These may influence the way we live, work or even think with regard to innovation and the role of entrepreneurship. During such rapidly changing and challenging times, entrepreneurship holds an important role in economic development. While some businesses may have been negatively impacted by the pandemic, other businesses have been able to seize new opportunities. The Global Report presents the first evidence-based worldwide assessment of the competing balance between those challenges and opportunities.

2.1 THE GEM CONCEPTUAL FRAMEWORK

The GEM report includes two surveys; the Adult Population Survey (APS) and the National Expert Survey (NES). The APS examines the attitude and activity of around 2,000 adults between the ages of 18–64 years in each participating economy and is operated 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 GEM as well as the participating economies to derive conclusions on entrepreneurship, including activity relevant to initiating or running a new or established business, on entrepreneurs' attitudes and perceptions on entrepreneurship, while also looking at specific characteristics such as age, gender and education.

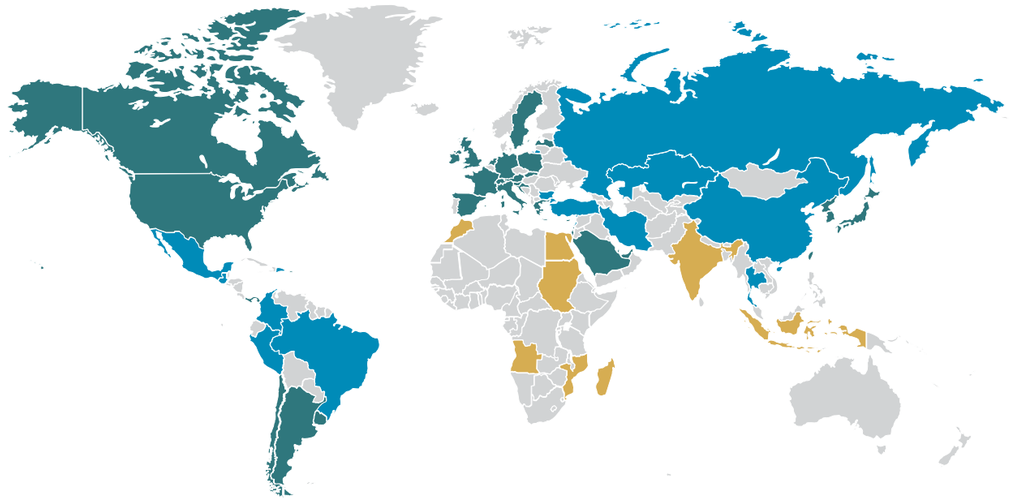
The APS is a survey that illustrates the attitudes, approaches and expectations of adult individuals, and as such it differs from businesses surveys and official government statistics such as business registrations. Instead, APS data provide insights on one's decision to initiate or continue a new or established business and on the entrepreneurial journey from its initial step through its subsequent development overall.

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 framework conditions 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 one of the said conditions are 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 ecosystem's entrepreneurial conditions. In carrying out NES in 2020, new questions were incorporated on examining how adequately entrepreneurs and governments responded to the economic challenges and opportunities of the pandemic.

Taken together, the APS and the NES surveys provide an accurate, comprehensive, recent picture of entrepreneurship in each participating economy. The Conceptual Framework of GEM is illustrated in Figure 2.2, which shows 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 target 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,

Figure 2.1: List of economies in GEM 2020/2021



	Low Income	Middle Income	High Income
Middle East and Africa	Angola, Burkina Faso, Egypt, Morocco, Togo	Iran	Israel, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates
Central & East Asia	India	Kazakhstan, Indonesia	Japan*, Republic of Korea, Taiwan
Latin America and Caribbean		Brazil, Colombia, Guatemala, Mexico*	Chile, Panama, Puerto Rico, Uruguay*
Europe and North America		Russian Federation	Austria, Canada±, Croatia, Cyprus, Germany, Greece, Italy, Latvia, Luxembourg, Netherlands, Norway, Poland, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, United Kingdom, United States

* Japan, Uruguay and Mexico did not participate in the 2020 APS | ± Canada did not paricipate in the 2020 NES

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 which is 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 NES, GEM examines the entrepreneurial ecosystems, and more particularly the

Figure 2.2: GEM Methodology

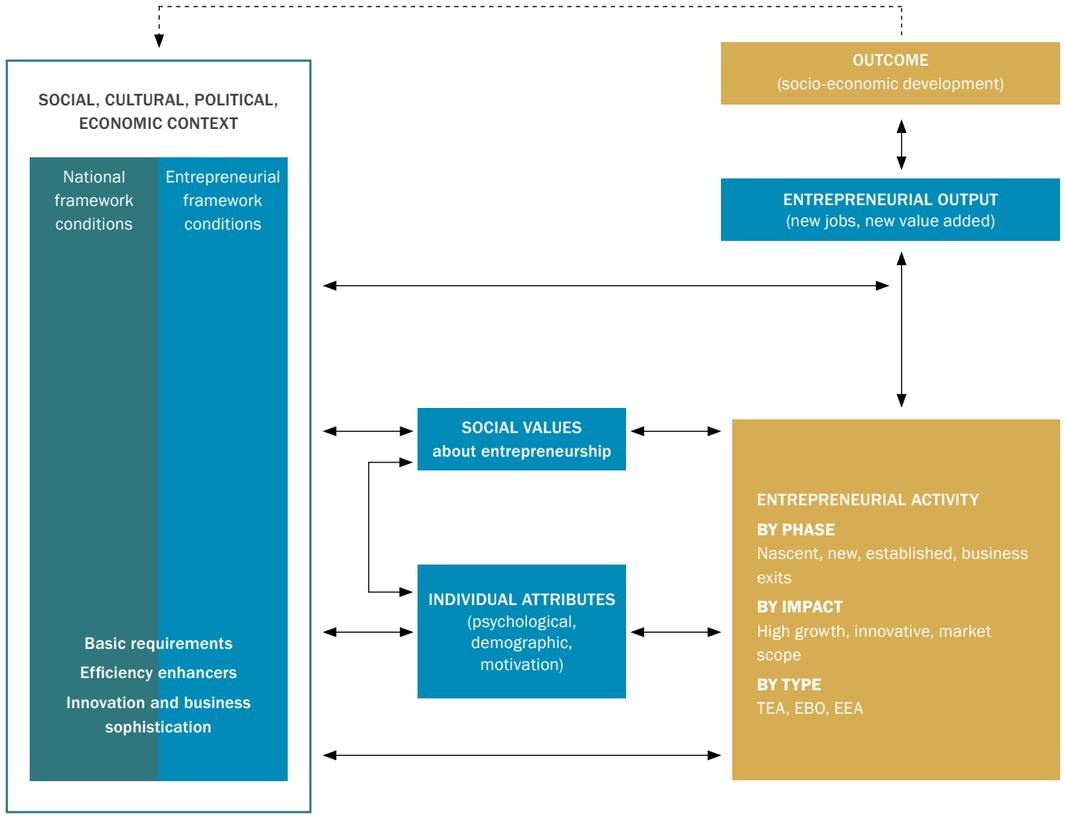
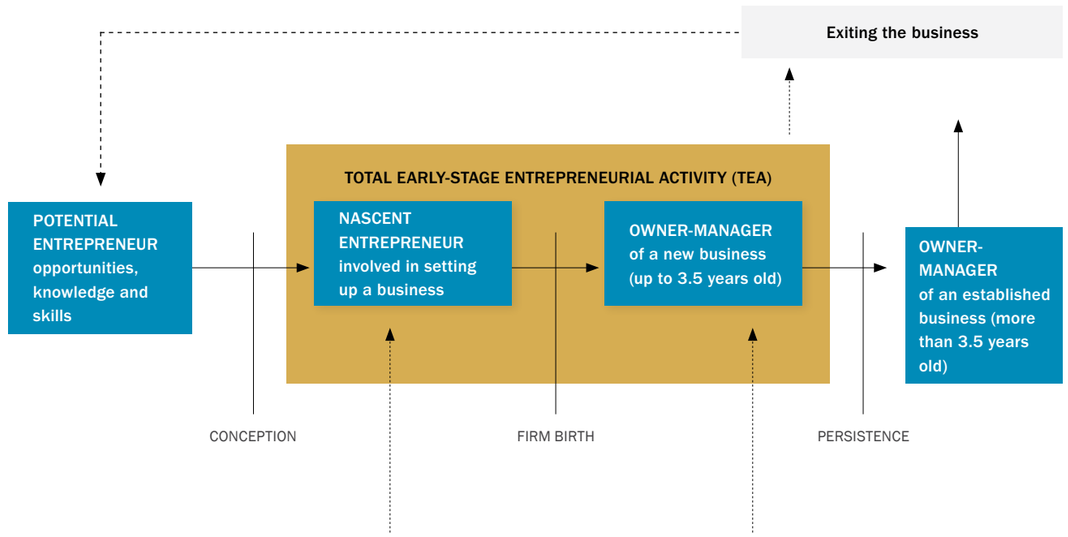


Figure 2.3: The entrepreneurial process and GEM operational definitions



Source: GEM 2019/2020

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).

Successful entrepreneurship encourages and stimulates economic development, generates and creates new jobs and adds new value to society despite the fact that at each stage of the entrepreneurial journey people might exit a business, many of whom might pick themselves up and re-start.

There are many different notions of enterprise and entrepreneurship. These range from the very broad (such as the activities of an enterprising individual) to the very narrow (such as the activities of someone who has started a business in a particular period). Both are conceptually valid but, given the objective of consistently measuring entrepreneurial activity across space and time, GEM has deliberately chosen to be very specific in its definition of entrepreneurship. Here, entrepreneurship is defined and measured as the activity of someone who is actively engaged in starting or running a new business. Recognizing opportunities for a new startup, thinking about starting a business, or intending to start a business can all be linked to entrepreneurship. However, as per GEM's methodology, only active behavior counts as entrepreneurship.

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. 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. Former business owners are an important resource. 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.

2.2 ENTREPRENEURSHIP IN THE AGE OF COVID-19

GEM responded to the COVID-19 pandemic in March 2020 by enhancing its methodology with additional questions regarding the barriers and opportunities of the pandemic, as well as on its expected impact. Due to the continuity of GEM data, GEM is able to provide harmonized measures of entrepreneurial activity, attitudes and perceptions over the past years and thus contribute to the identification of any initial changes caused by the pandemic. This year's GEM included additional questions in the APS on the impacts of the pandemic in terms of its effects on the ease (or difficulty) of starting a business, whether a new or existing business had to be curtailed, how growth expectations were affected, and about the adequacy (or otherwise) of government responses to the resulting economic impact. This year's Cyprus GEM report will focus on the first entrepreneurial impacts of the pandemic. Considering the data captured by the GEM methodology, this approach adds another layer of understanding to the results of the APS 2020. As Cyprus has participated in GEM in the previous years, this provides the opportunity to include a comparison of key results from across the previous years and the pandemic year (2020).

THE GEM METHODOLOGY IDENTIFIES FIVE 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 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 population (18-64 years' old) who believe they have the required skills and knowledge to start a business.

Entrepreneurial intention: Percentage of the population aged 18–64 years (individuals involved in any stage of entrepreneurial activity excluded) who are latent entrepreneurs and who intend to start a business within three years.

Fear of failure rate: Percentage of the population aged 18–64 years perceiving good opportunities, 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.

Indicators describing the life cycle of a venture:

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

Established business ownership rate: Percentage of the adult population between 18 and 64 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 (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 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.

National/Entrepreneurial framework conditions:

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

ENTREPRENEURIAL ACTIVITY IN CYPRUS IN 2020/2021

GEM has been measuring entrepreneurial activity in Cyprus since 2016. The current section reports the results of this year's APS. These include insights on societal values and perceptions on entrepreneurship, the level of entrepreneurial activity across early-staged and established businesses and their expected impact. The analysis also reports on the results of the previous years in order to provide comparisons of the findings. It also compares Cyprus' entrepreneurial indexes to the corresponding index values of Greece and Luxembourg due to cultural and geographical proximity reasons (Greece) and population size similarity (Luxembourg), in accordance with last year's GEM Cyprus approach. Where possible, it also draws on the average rates of countries in Europe and uses these values as benchmark rates.

One of the new questions in this year's APS required each participant to reflect on whether the COVID-19 pandemic has affected their household income. Answers on a 5-point Likert scale ranged from Strong decrease to Strong increase of household income. Figure 3.1 summarizes the findings in Cyprus as well as other selected economies. In Cyprus, 17.1% of the population experienced a strong decrease in their income, whereas for 26.6%, their income decreased somewhat. 54.8% of the population indicated no substantial change. The corresponding European average value for those experiencing strong decrease is lower compared to Cyprus' (12.2%) and similar to those experiencing a somewhat decrease (27.3%) or no substantial change (55.5%). Compared to Cyprus, a smaller number of residents of Luxembourg have seen negative changes on their household income, whereas the majority reported no substantial changes (68.8%). About 5% 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. In Cyprus, only 1.5% of the population had experienced a similar increase in their household income.

3.1 SOCIETAL VALUES & PERCEPTIONS ON ENTREPRENEURSHIP

The GEM methodology encapsulates questions on societal values and perceptions toward entrepreneurship. Although the insights extracted through these questions are not direct indexes of entrepreneurial activity, they do provide useful indications on the broader entrepreneurial environment. In particular, values and perceptions on entrepreneurship shape an economy's future entrepreneurial intentions.

GEM reflects on the perceptions of the population with regards to entrepreneurial opportunities. In Cyprus, in 2020/2021, 21.1% of the population perceives that there are good opportunities to start a business in their area (Figure 3.2). In Greece, 27.9% of the population believes that there are opportunities whereas the corresponding value in Luxembourg is 41.9%. The European average value on this index is 39.5%. This leads to the conclusion that compared to the residents of these countries/geographical areas, Cypriots are more pessimistic regarding opportunities for entrepreneurial activity. Cyprus' index value on perceived opportunities has been notably reduced compared to the previous years, indicating the possible impact of COVID-19 pandemic on the perceived entrepreneurial opportunities in Cyprus (down from 38.5% in 2019/2020 and 45.9% in 2018/2019). Compared to previous years, the European average value on perceived opportunities has also been notably reduced (down from 50% last year).

GEM also reports on the perceived ease of starting a business in each country. As illustrated in Figure 3.3, in 2020/2021, about one in two residents in Cyprus perceives that it is easy to start a business locally. The index value in Cyprus is by 11.5% higher compared to the corresponding value reported in 2019/2020. This is higher than the corresponding value in Greece (25.9%); it is however lower to the European average value (53.8%) and Luxembourg's index value (63.9%), thus highlighting the need for further improvement on the processes required and the support provided for starting a business in Cyprus.

Although the population's perceptions on entrepreneurial opportunities in Cyprus have been reduced compared to last year, the perceptions regarding the perceived capabilities including knowledge, skills and experiences to start a news business have been consistent to last year. In particular, as illustrated in Figure 3.4, in 2020/2021, 58.1% of the population in Cyprus perceives that they have the necessary capabilities for starting a business (corresponding last year's value was 58.2%). Cyprus' index value on perceived capabilities is higher compared to Greece (53.3%) and Luxembourg (45.7%) as well as the European average index value (52.6%).

As illustrated in Figure 3.5, fear of failure in Cyprus has increased compared to last year. In 2020/2021, about one in two residents in Cyprus indicate that they fear failure associated to starting a new business. This value is notably higher compared to last year (36.4%), possibly affected by the uncertainties arising by the pandemic as well as by other factors. Compared to other countries, the index value is lower in Luxembourg (42.3%) and higher in Greece (53.1%). Cyprus' results are also higher compared to the European average value (42.1%). These results highlight that fear of failure in Cyprus remains an obstacle of entrepreneurial activity and signals the need for further action targeted in altering the fear of failure perceived by the population.

In 2020/2021, the majority of the population personally know an entrepreneur (Figure 3.6). In particular, 68.1% of the population noted that they know somebody who has initiated entrepreneurial activity. This index has been increasing across the years, indicating that entrepreneurship is becoming one of the main career choices of the population. More specifically, the index value was 56% in 2019/2020, marking an increase of 12.1% from last year, whereas it has doubled compared to two years ago (was 33.2% in 2018/2019). Cyprus' index value is higher compared to the European average rate used as benchmark (50.7%) as well as the index values in Greece (32.5%) and Luxembourg (45.9%).

This year's GEM APS extracted data on the impact of COVID-19 pandemic on societal perceptions towards entrepreneurship (Figure 3.7). In Cyprus, 38.5% of the population know someone who has stopped a business due to the pandemic. This value is higher compared to Luxembourg (17.2%) and Europe (30.5%), but lower compared to Greece (45.6%). Conversely, and despite the

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

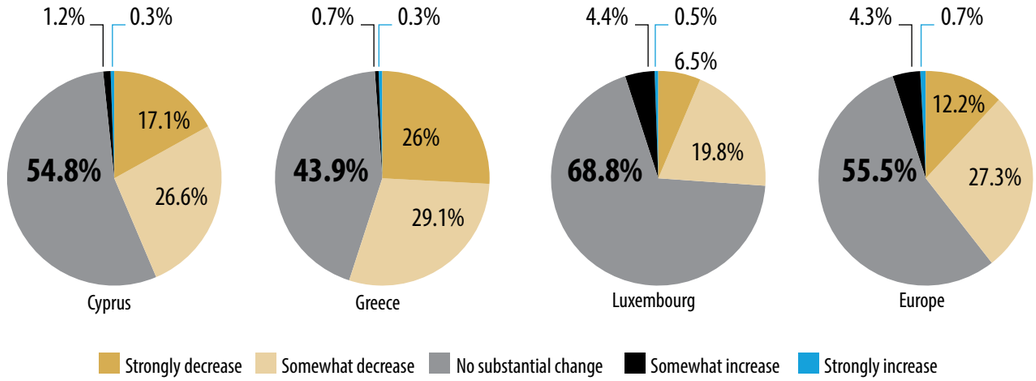


Figure 3.2: Perceived Opportunities: There are good opportunities to start a new business in my area (% adults)

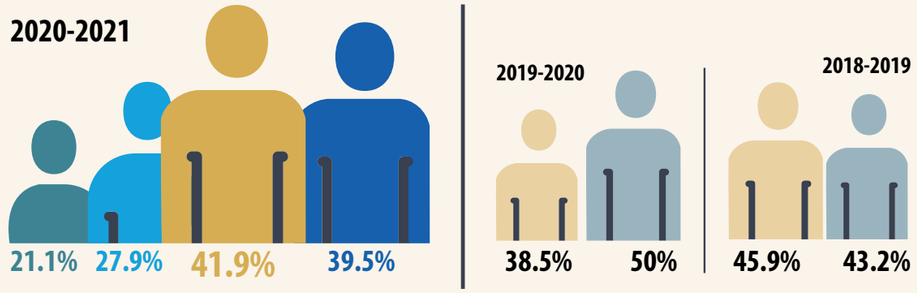


Figure 3.3: Perceived Ease: It is easy to start a business in my country (% adults)

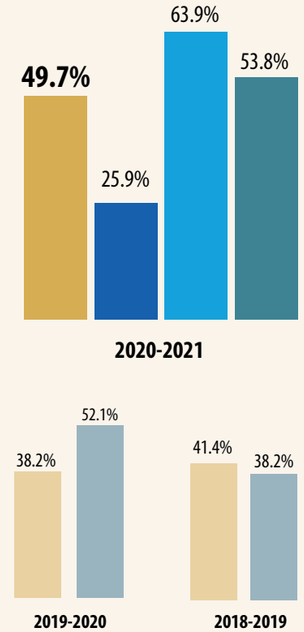
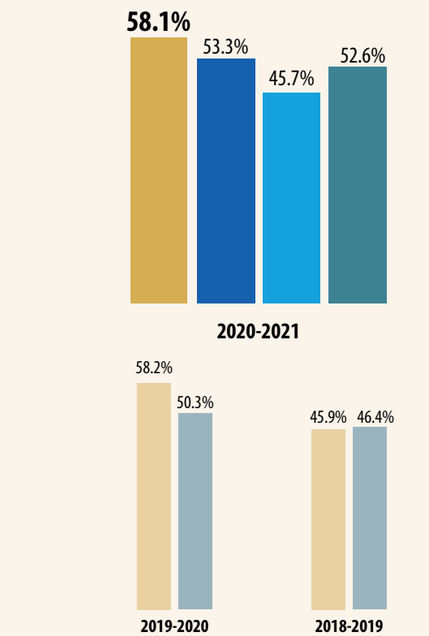


Figure 3.4: Perceived capabilities: You personally have the knowledge, skills and experience to start a new business (% adults)



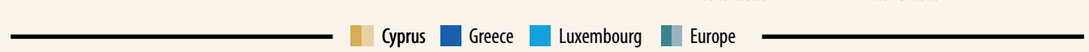


Figure 3.5: Fear of Failure: would not start a business for fear of failure (% adults)

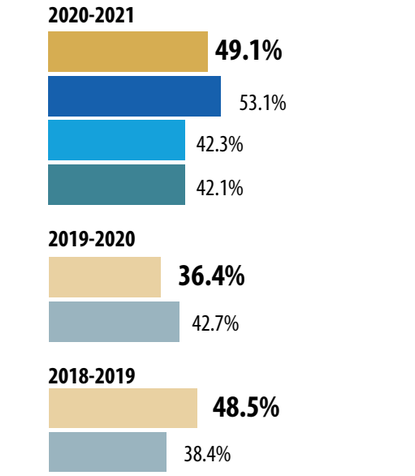
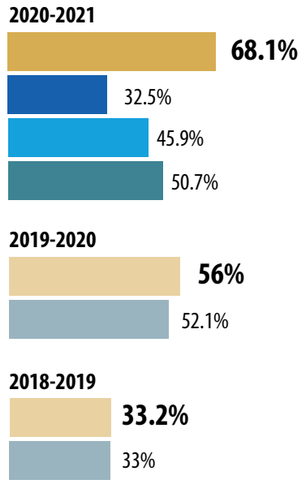


Figure 3.6: Personally know an entrepreneur (% adults)



aforementioned notable number, in Cyprus about one in three residents know someone who started a business due to the pandemic. This highlights that the population also seized opportunities arising by the pandemic for new businesses. Compared to other countries used as benchmark, this index value is higher compared to Greece's (13%) and Luxembourg's (6.3%), and is also higher compared to the corresponding European average rate (12.8%). This is also reflected in the perception on whether starting a business is more difficult compared to a year ago (i.e., before the pandemic). 42.1% of the population in Cyprus consider that it became more difficult compared to the pre-pandemic era. Placed against other populations, Cypriots appear to be more optimistic regarding the difficulties in starting a business before and during the pandemic. Both Greece's and Luxembourg's indexes stand higher (75.5% and 58.6% respectively), while the European average value is also higher (49.5%). Finally, regarding the question of whether the pandemic has led to a delay in getting the business operational, 64.5% of the population in Cyprus agreed with this statement. The perceptions in Greece (69.3%) and in Luxembourg (67.6%) are rather similar in comparison.

3.2 ENTREPRENEURIAL ACTIVITY

Information on the attitudes and perceptions presented so far are important proxies of the population's intentions towards entrepreneurship. However, data on actual entrepreneurial activity can provide useful insights on the level of entrepreneurial activity and its expected impact on economy and society. This Section presents the results of the Adult Population Survey (APS) with regards to entrepreneurial activity. In particular, it draws on the following entrepreneurship indexes:

- Those starting or running a new business, or Total early-stage Entrepreneurial Activity (TEA), measured as a percentage of the adult population (% adults);
- Those running an established business, or Established Business Ownership (EBO) (% adults);
- Those starting or running a business on behalf of their employer, or Entrepreneurial Employee Activity (EEA, % adults).

This section describes each of these indexes and provides insights on the status of each index regarding Cyprus, Greece, Luxembourg and EU average. As the 2021/2021 APS included

Figure 3.7: Pandemic & Entrepreneurship (% adults)

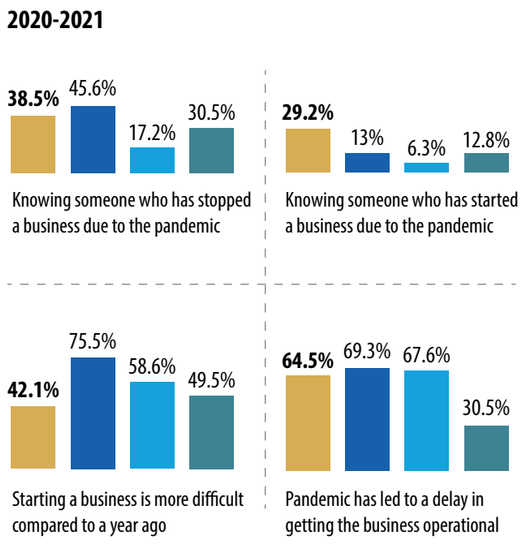
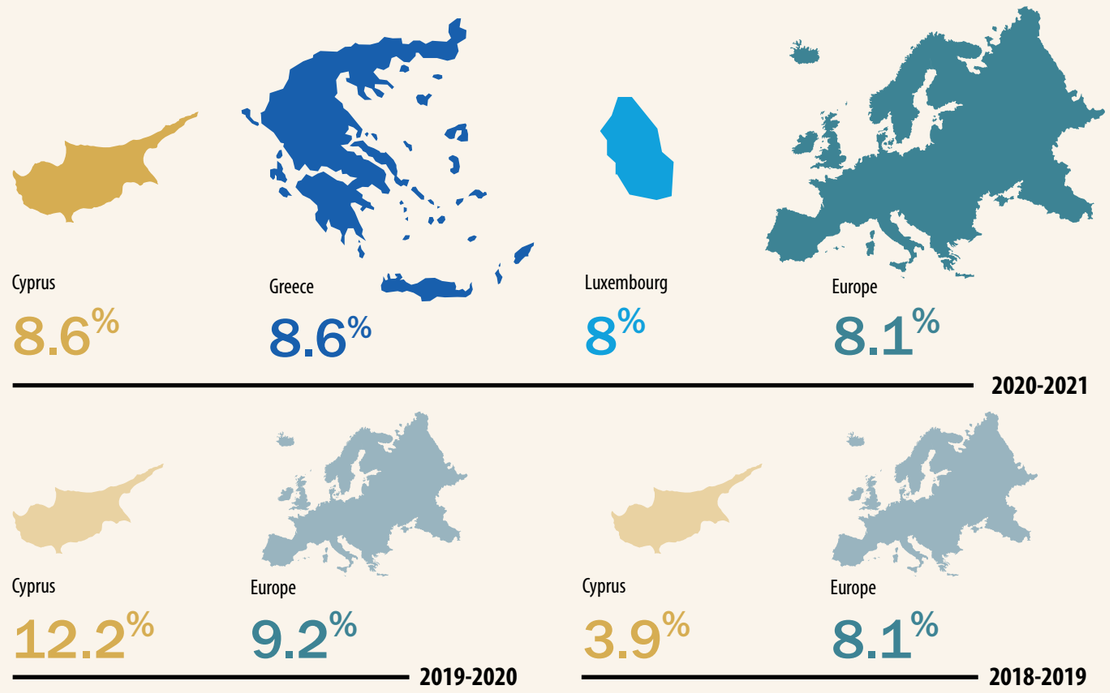


Figure 3.8: TEA index rates (% adults)



questions on the impact of the COVID-19 pandemic with respect to entrepreneurial activity, results arising by these questions are also included in this Section.

3.2.1. Total early-stage Entrepreneurial Activity (TEA)

The Total Early-Stage Entrepreneurial Activity (TEA) index provides insights on new entrepreneurial activity which could be later converted into established businesses. The TEA index reflects on the country's entrepreneurial potential and is therefore considered as one of the most important indexes of the GEM methodology. The TEA index includes both nascent entrepreneurs and new business owners. Overall the total early-stage entrepreneurial activity in Cyprus has decreased compared to the previous year (8.6% in 2020/2021 compared to 12.2% in 2019/2020) (Figure 3.8). The reduction in Cyprus' TEA index rate could be possibly attributed to the pandemic and its impact on business activity, especially early-staged. Similarly, compared to last year, the EU-average rate has also been reduced. In comparison to the 2020/2021 corresponding European average rate, Cyprus' TEA rate is higher by 0.5%. Greece recorded a similar TEA value to Cyprus, whereas Luxembourg's TEA activity stands lower, at 8%. Compared to other countries with geographical proximity, Cyprus' TEA index rate has been lower than United Arab Emirates' (15.4%) and similar to Israel's (8.5%). Figure 3.9 provides information on the TEA index rates of countries included in the European regional area as well as other regions.

Nascent entrepreneurs

GEM regards nascent entrepreneurs as entrepreneurs who are on the very early-stage development of their entrepreneurial activity and who are currently seeking to set up a new business, have part-time or full-time involvement in this activity and will have at least partial ownership of the new business. Nascent entrepreneurship is relevant to new ventures that have not paid any wages for the past three months.

Nascent entrepreneurship in Cyprus has decreased compared to the pre-pandemic year (5.1%, down from 7.9%) As illustrated in Figure 3.10, the respective European average rate also decreased compared to last year, indicating an overall decrease in nascent entrepreneurship across Europe, possibly due to the pandemic. However, compared to the European average rate drop from the previous year (0.7%), Cyprus' nascent entrepreneurship has seen a larger drop (at 2.8%), which indicates that very early-staged entrepreneurial activity in Cyprus is less resilient to changes in the economic and health landscape. In 2020/2021, Cyprus' nascent entrepreneurship stands lower compared to Luxembourg's 5.7% but higher compared to Greece's 3.3 %.

New business owners

In 2020/2021, 3.6% of Cyprus' population has been identified as new business owners (Figure 3.11). This index is lower compared to the previous year (4.6%). Such a reduction

Figure 3.9: Cross-Country Comparison Total early-stage Entrepreneurial Activity (TEA) and Established Business Ownership (EBO) (both % of adults aged 18–64)

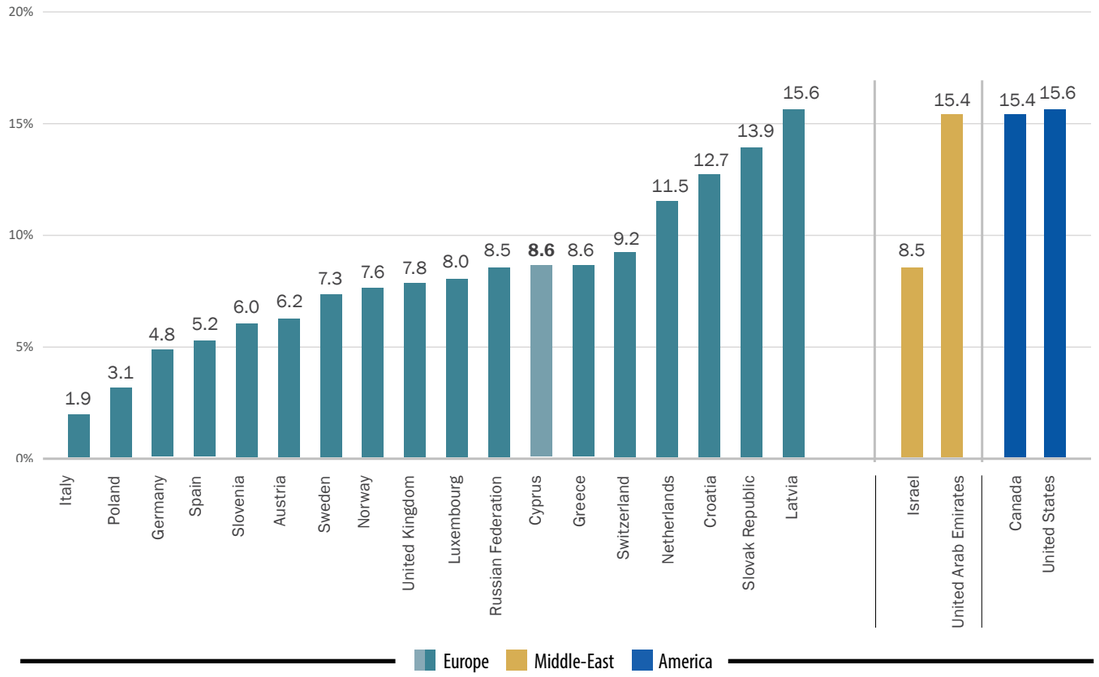


Figure 3.10: Nascent Entrepreneurs in Cyprus and Europe[1]

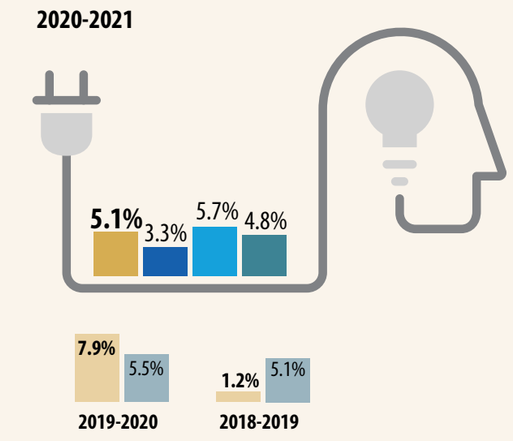
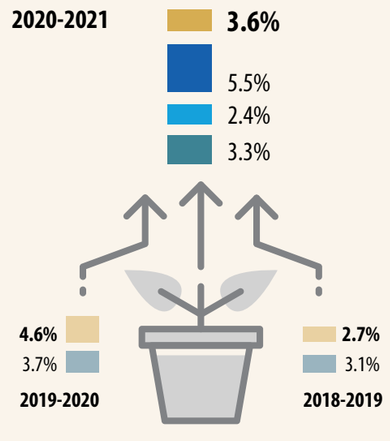


Figure 3.11: New business owners[1]



1 Values have been rounded to the nearest 0.1.

may also be the result of the pandemic and is directly reflected in Cyprus' TEA index rate. Cyprus' new business ownership is lower compared to Greece's (5.5%) and higher to Luxembourg's (2.4%) and to the European average rate (3.3%). GEM results show that although both the rates of nascent entrepreneurship and new business ownership in Cyprus have decreased this year, it is nascent entrepreneurship that has been largely affected. In particular, the decrease of nascent entrepreneurship and new business ownership in Cyprus has been 2.8% and 1% respectively. These results show that entrepreneurial activity at a very early-stage is possibly more vulnerable and has possibly been more affected by the pandemic. Thus, this year's TEA index rate reduction is more related to changes in nascent entrepreneurial activity rather than new entrepreneurship ownership.

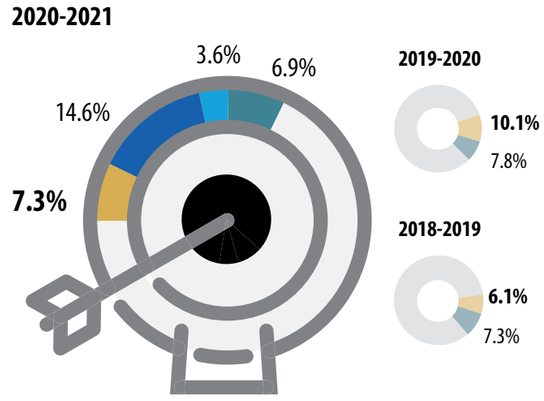
3.2.2 ESTABLISHED BUSINESS OWNERS

The GEM methodology also includes established business owners. In 2020/2021, the rate of established business owners in Cyprus is 7.3%. This rate is lower than the 2019/2020 rate (10.1%). This reduction is again possibly related to the impact of the pandemic. Cyprus' established business ownership is higher than both the corresponding European average rate (6.8%) as well as Luxembourg's rate (3.6%). However, as illustrated in Figure 3.12, it stands lower compared to Greece's (14.6%). In other countries of geographical proximity such as Israel, the established businesses index rate stands at 4.2%. Figure 3.13 provides a cross-country comparison of the index rates of countries in the European geographical area and beyond.

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 minor impact on employee entrepreneurial activity in businesses in Cyprus. As illustrated in Figure 3.14, Cyprus' rate is higher compared to the European

Figure 3.12: Established business ownership



average rate (3.8%) as well as compared to the corresponding index values in Greece (1.2%) and Luxembourg (4.3%).

3.3 PROFILE OF ENTREPRENEURS IN CYPRUS

The profile of entrepreneurs in each economy is also captured by GEM's methodology including age, gender and education. The relevant index values of Cyprus, Greece, Luxembourg and EU average are reported in this section.

Age distribution

In Cyprus, the most active age group in TEA is the 25-34 age cohort, followed by the 35-44 age cohort. In particular, 12% of the adult population in the 25-34 age cohort and 10.7% of the population in the 35-44 age cohort are active in TEA. The 45-54 age cohort is also notably active in TEA, with 8.1% noting early-staged entrepreneurial activity (Figure 3.15). Compared to the EU average rates, Cyprus' activity in these cohorts is higher that the EU average rates. The involvement of the 18-24 age cohort in TEA in Cyprus is relatively low, possibly due to military or education commitments. However, the

Figure 3.13: Cross-Country Comparison Established Business Ownership (EBO) (both % of adults aged 18–64)

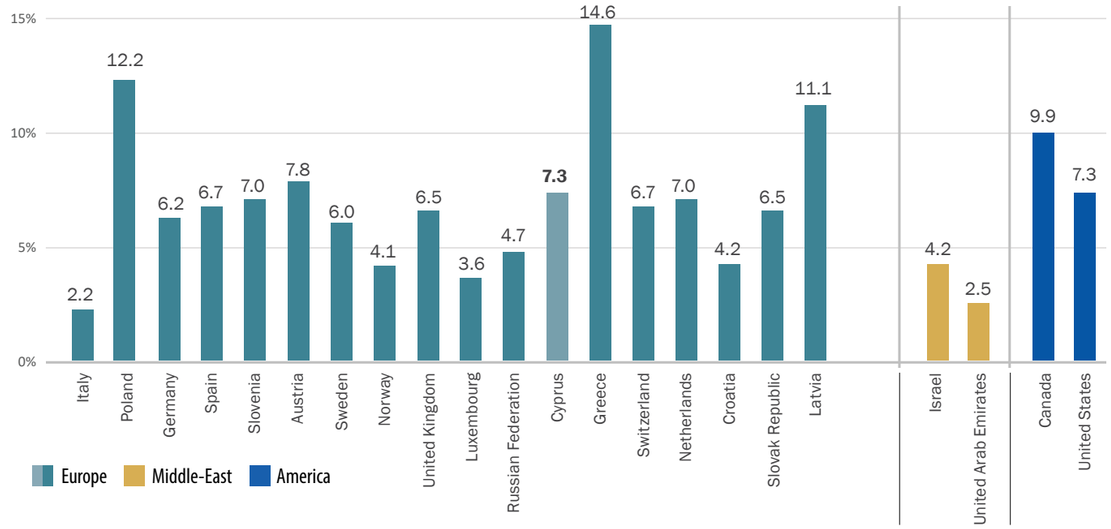
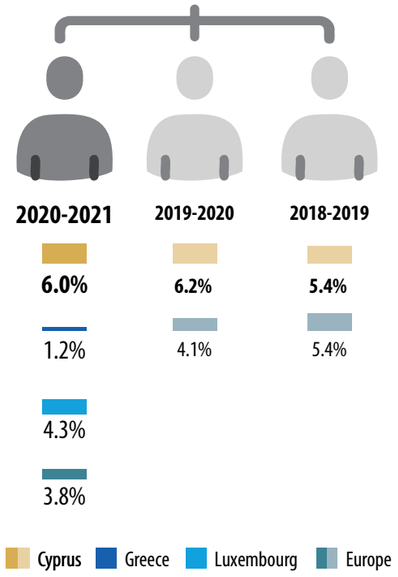


Figure 3.14: Employee entrepreneurial activity in Cyprus and Europe



corresponding European average rate is 9.8%, demonstrating that it is possible to pursue entrepreneurial endeavors at this age. Similarly, in Greece, the most active age cohort is 18-24 (18.2%). The second most active age cohort is 25-34 (9.7%), followed by the 35-44 age cohort (7.4%). Finally, similar to Cyprus, the most active age cohort in in Luxembourg's TEA is the 25-34 cohort (9.8%), while both 18-24 and 35-44 age cohorts are also relatively active (8.3%).

Figure 3.15: Total early-stage Entrepreneurial Activity (TEA) by age group (% of adults in each age group) 2020/2021

2020/2021

	Cyprus	Greece	Luxembourg	Europe
18-24 years	5.4%	18.2%	8.3%	9.8%
25-34 years	12.0%	9.7%	9.8%	11.5%
35-44 years	10.7%	7.4%	8.3%	8.7%
45-54 years	8.1%	6.1%	7.7%	7.0%
55-64 years	5.0%	2.6%	5.4%	4.2%

Gender distribution and motives

GEM also reflects on the gender distribution in TEA. In 2020/2021, in Cyprus, 11% of the adult male population and 6.1% of the female population are active in TEA, down from 15.6% and 8.9% respectively in 2019/2020. This can be attributed to the overall reduction of Cyprus' TEA rate compared to last year. However, the rate of female to male involvement in TEA in Cyprus remains unchanged for the same period. More specifically, the ratio of female to male TEA involvement in Cyprus is 0.6. This ratio value has been consistent for Cyprus across all five years in which Cyprus has been participating in GEM. Cyprus' ratio of female to male involvement in TEA is aligned with the European average value as well as with the corresponding value in Greece. Luxembourg's ratio in 2020/2021 is only marginally lower (0.5). Both the ratios of Greece and Luxembourg have been reduced compared to last year, possibly signaling that pandemic impacts have possibly affected the entrepreneurial activity of females more, compared to males.

Figure 3.16: Total Early-Stage Entrepreneurial Activity (TEA) rates and gender

2020/2021

	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%
Ratio of female/ male TEA	0.6	0.6	0.5	0.6

2019/2020

	Cyprus	Greece	Luxembourg	Europe
Male TEA (% of adult male population)	15.6%	8.8%	12%	11.2%
Female TEA (% of adult female population)	8.9%	7.6%	8.3%	7.1%
Ratio of female/ male TEA	0.6	0.9	0.7	0.6

Education

APS invites respondents to report on their higher level of educational attainment. Access to education as well as the definition of educational levels and the age at which education becomes non-compulsory vary across different countries in Europe and beyond. Therefore, 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. 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). In Cyprus, 9.7% of TEA are non-graduates, whereas 7.4% of TEA are graduates. In Europe, 17.9% of TEA are graduates and 14.3% of TEA are non-graduates. Similarly, in Greece and Luxembourg, a graduate is more likely to initiate entrepreneurial activity compared to a non-graduate (Figure 3.17).

Figure 3.17: Level of Total early-stage Entrepreneurial Activity (TEA) for graduates and for non-graduates

2020/2021

	Cyprus	Greece	Luxembourg	Europe
% TEA non-graduates	9.7%	8.0%	5.3%	14.3%
% TEA graduates	7.4%	9.4%	11.0%	17.9%

3.4 ENTREPRENEURSHIP & IMPACT

GEM also invites respondents to reflect on the aspired impact of their entrepreneurial activity. These aspirations are important since they serve as proxies for the expected growth of the entrepreneurial ecosystem and further economic growth in each economy. In this subsection, we report on the expected job creation arising by TEA, the international orientation, innovation level and the level of technology employed in new entrepreneurial endeavors. New entrepreneurs may have expectations regarding the employability of their entrepreneurial activity, including expectancy to employ no one but themselves in the next five years or expectancy to employ more than five employees. They also have expectations regarding their target audience; these may be customers from the local, national or international market.

Job creation

Respondents participating in TEA were invited to report on their aspirations regarding the generation of new job positions as a result of their entrepreneurial activity in the next five years. Figure 3.18 illustrates the expected job growth of those starting or running new businesses, divided into those expecting zero new job openings, those expecting one to five job openings and those expecting six or more job openings. In Cyprus, 3.8% of the adult population expects to employ one to five additional employees in the next five years; 2.8% expect six or more new job openings; finally, 2% of the population expects no new job positions as a result of their entrepreneurial activity in the next five years. Cyprus TEA entrepreneurs seem optimistic compared to the other benchmark countries for the same period. In Greece, 4.8% of the population expects no new job openings, 2.7% expects one to five new job openings and only 1.1% expects six or more new job positions. Reflecting on the European average values, the majority of the population does not expect any new job positions, 2.7% of the population expects one to five job positions and only 1.8% expects six or more job positions.

International orientation

Entrepreneurial activity may offer products or services, targeting local, national or even international audiences. The APS reports on the orientation of TEA in each country, by reporting on TEA and those within TEA who target customers only within their local area, only within their nation or internationally. In Cyprus, 3.7% of the population targets international customers, 3% of the population targets customers only within Cyprus whereas 1.9% targets customers only within their local area. Compared to Luxembourg, Cyprus has lower international orientation. In Luxembourg 0.5% of the population targets customers only within their local area, 3% targets a nationwide audience while 4.6% has international orientation. As illustrated in Figure 3.19, in Europe, 2.8% of the population targets international customer audiences whereas 2.2% is limited to the local audience and 2.9% to the national customer audience. These results are also reflected on the percentage of adults in TEA who anticipate at least 25% of their revenue from outside their economy (Figure 3.20). In Cyprus, 2.39% of TEA anticipate at least 25% of their revenue from outside their economy. Luxembourg's rates are similar (2.23% of TEA expects at least 25% of the revenue from outside the country). Compared to Cyprus however, the corresponding index rates in Greece and Europe stand substantially lower (1.37% and 1.32% respectively).

Innovativeness and Hi-Tech

Figure 3.21 reports on new businesses which consider their products or services as new to their area, country or the world. In Cyprus, 1.37% of the population considers their product or service as innovative to the national target audience, whereas 0.46% of the population regards their product or service as new to the world. In Europe, 0.76% of the population reporting that the product is new to their country and 0.46% considering product sufficiently innovative so as to be new to the world. The APS also extracts information on the use of innovative technologies by new businesses (Figure 3.22). In particular, it reflects on whether new businesses are using technology or processes that are either new to their area, new to their country or new to the world. In Cyprus, 1.47% of the population considers the technology employed as new to their country, whereas 0.52% considers it as new to the world. Similar rates are observed in Luxembourg, where 1.22 % of the population considers the technology employed as new to their country and 0.4% considers it as new to the world. The EU average value regarding this index is 0.72% of the population noting that the technology used is new to their country and 0.4% of the population noting it as new to the world.

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	2.0%	4.8%	2.7%	3.3%
1-5 jobs	3.8%	2.7%	2.6%	2.7%
6 or more jobs	2.8%	1.1%	2.7%	1.8%

Figure 3.19: The level of Total early-stage Entrepreneurial Activity (TEA) and those within this, having customers only within their local area, only within their own country, and those with international customers (all % of adults aged 18–64)

Customer expectations

	Cyprus	Greece	Luxembourg	Europe
Local only	1.9%	2.4%	0.5%	2.2%
National	3%	2.6%	2.8%	2.9%
International	3.7%	3.5%	4.6%	2.8%

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	2.39%	1.37%	2.23%	1.32%

Figure 3.21: The proportion of 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)

Proportions of adults starting a new business (products & services)

	Cyprus	Greece	Luxembourg	Europe
New to their area	0.46%	0.94%	1.21%	1.11%
New to their country	1.37%	0.75%	1.66%	0.76%
New to the world	0.46%	0.43%	0.47%	0.46%

Figure 3.22: 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	0.40%	0.69%	0.75%	0.90%
New to their country	1.47%	1.06%	1.22%	0.72%
New to the world	0.52%	0.22%	0.40%	0.40%

3.5 COVID-19 PANDEMIC & IMPACT ON BUSINESSES

In the 2020/2021 study, both TEA entrepreneurs and established business owners were asked some questions about the impacts of the COVID-19 pandemic. In particular, TEA entrepreneurs were asked to express their agreement or disagreement with the statement “The coronavirus pandemic has provided new opportunities that you want to pursue with this business”. Established business owners were also invited to respond to a similar statement: “The coronavirus pandemic has led to new business opportunities that are currently being pursued in your business”. The response options were “strongly agree”, “somewhat agree”, “neither agree nor disagree”, “somewhat disagree” and “strongly disagree”. As illustrated in Figure 3.23, 3.3% of the population foresees opportunities because of the pandemic whereas 5.2% does not. Compared to other benchmark countries, TEA entrepreneurs in Cyprus have been more optimistic regarding the opportunities generated by the pandemic, as only 1.8% of the population in Greece and 2.4% of the population in Luxembourg responded positively to the statement. Along the same lines, the EU average rate for this question has been 2.6%. Regarding established businesses, only 1.2% of the population in Cyprus have responded positively and expect opportunities because of the pandemic, which is slightly below the European average rate (1.3%), whereas 6.1% has responded negatively, which is above the respective European rate (5.5%). In Greece, 1.7% foresees opportunities because of the pandemic and 12.8% does not, while in Luxembourg only 0.8% expects opportunities and 2.8% does not. Because of the maturity of each type of entrepreneurial activity, it is to some extent expected that TEA entrepreneurs who are starting or running a new business are more likely to be alert to new opportunities.

Aiming to explore the impacts of COVID-19 pandemic, this year’s APS also questioned TEA entrepreneurs and established business owners on whether “compared to one year ago, are expectations of business growth much lower, somewhat lower, about the same, somewhat higher or much higher?”. As illustrated in Figure 3.24, about one in three TEA entrepreneurs in Cyprus consider that their business growth expectations are somewhat or much lower, compared to one year ago. However, TEA entrepreneurs in Europe appear to be even more pessimistic on business growth as 43.1% of European TEA entrepreneurs noted that their business growth expectations are somewhat or much lower, compared to one year ago. In Greece, more than one in two entrepreneurs consider their business growth expectations somewhat or much lower, compared to one year ago, whereas in Luxembourg the corresponding index rate has been 44.9%.

Established business owners appear to be more pessimistic regarding business growth. In Cyprus, 49.7% of established business owners noted that their business growth expectations are lower, compared to the year before the pandemic. Similarly, the European average rate is 49.9%. In Greece, 72% of established business owners have not been optimistic about their expected business growth compared to the previous year (2019), whereas in Luxembourg the rate stands at 57.5%. These results show that the circumstances of the past year have disturbed expectations on business growth for entrepreneurs. However, established business owners appear to expect even more consequences to their business growth compared to TEA entrepreneurs. This is possibly linked to the freshness of those starting new businesses who continue to be optimistic whereas many established business owners have to deal with the realities of business conditions as arising by the pandemic. Another explanation may be that new businesses are more technology-oriented or more flexible and that such arrangements allows them to remain more optimistic compared to established businesses.

Figure 3.23: COVID-19 pandemic and perceived opportunities for entrepreneurs

Total early-stage Entrepreneurial Activity (TEA) & agree/disagree that there are new opportunities because of the pandemic (% of adults aged 18–64)	Cyprus	Greece	Luxembourg	Europe
See new opportunities because of COVID-19 pandemic	3.3	1.8	2.4	2.6
Do not see new opportunities because of COVID-19 pandemic	5.2	6.9	5.4	5.4
Established Business Ownership (EBO) & agree/disagree that there are new opportunities because of the pandemic (% of adults aged 18–64)				
See new opportunities because of COVID-19 pandemic	1.2	1.7	0.8	1.3
Do not see new opportunities because of COVID-19 pandemic	6.1	12.8	1.3	5.5

Figure 3.24: COVID-19 pandemic and business growth expectations for entrepreneurs

	Total early-stage Entrepreneurial Activity (TEA) and Established Business Ownership (EBO) reporting their business growth expectations are somewhat or much lower, compared to one year ago	
	% Total early-stage Entrepreneurial Activity	% Established Business Ownership
Cyprus	31.9	49.7
Greece	57.3	72.0
Luxembourg	44.9	57.5
Europe	43.1	49.9

Figure 3.25 COVID-19 pandemic and impact on TEA starting a business and getting the business operational

	Total early-stage Entrepreneurial Activity (TEA) who think starting a business is somewhat or much more difficult compared to a year ago (% of TEA)	Total early-stage Entrepreneurial who agree that the pandemic has led to a delay in getting the business operational (% of TEA)
Cyprus	42.1	64.5
Greece	75.5	69.3
Luxembourg	58.6	67.6
Europe	49.5	61.0

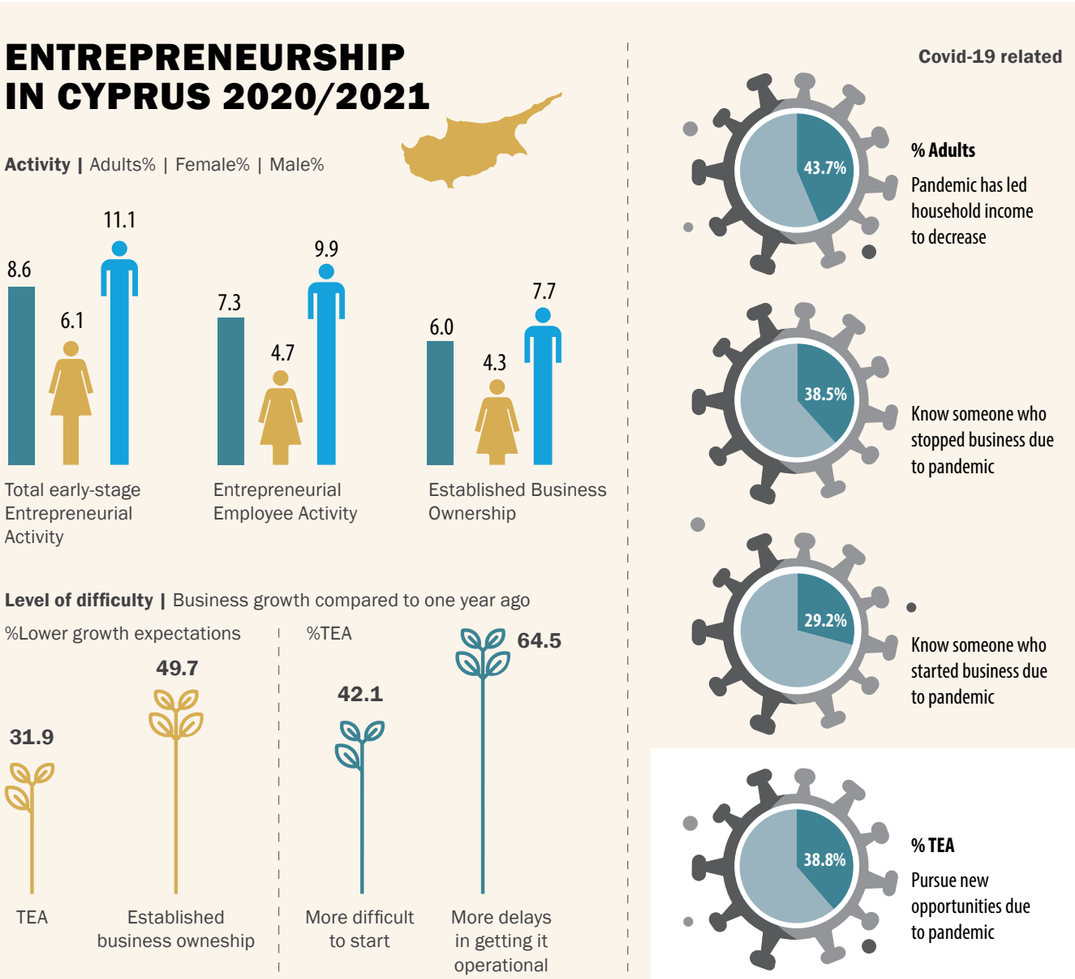
Although TEA entrepreneurs have been more optimistic on business growth compared to established business owners, the COVID-19 pandemic has brought notable difficulties to TEA entrepreneurs. As illustrated in Figure 3.24, 42.1% of TEA in Cyprus believe that starting a business is somewhat or much more difficult compared to a year ago. Cyprus' index is slightly below the EU average rate on this index (49.5%). In the other countries used as benchmark, TEA entrepreneurs appear to be less optimistic: 75.5% of TEA in Greece perceives that it is more difficult to start a business compared to last year, whereas in Luxembourg the corresponding index value is 58.6%. There is even more agreement among those starting a new business (i.e., TEA) that the pandemic has led to a delay in getting the business operational. In Cyprus, more than one in two TEA entrepreneurs perceive that that the pandemic has caused such delays (64.5%). TEA entrepreneurs in Greece (69.3%) and Luxembourg (67.6%) also agree with this view. The index rate in all 3 countries has been higher compared to the EU average rate (61%). However, 61% remains a remarkable number of TEA entrepreneurs across the EU who agree with the aforementioned statement. Taking into consideration that new businesses at this early stage are already fragile, it could be argued that the pandemic has made the majority of such businesses even more vulnerable in their crucial early days.

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. 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. The APS also invites respondents to provide information regarding their business exit (e.g., sold, shut down, discontinued or quit a business). Reasons for exit may vary. Positive reasons may be related to selling the business, finding an attractive alternative employment offer or other business opportunity, retirement or some other planned exit. Negative reasons may be lack of profitability, burdens of tax or bureaucracy, difficulty in accessing finance or other resources, family or personal reasons, and, in 2020, the impact of the COVID-19 pandemic. Figure 3.25 illustrates the percentages of the adult population who noted that their businesses experienced positive, negative and pandemic-related exits. In Cyprus, 0.5% of the adult population noted that exit for reasons grouped as positive, whereas 1.3% highlighted that their exit was relevant to negative reasons. The COVID-19 pandemic also influenced business exits in Cyprus as the majority of exits (1.4%) was related to reasons associated with the pandemic. Compared to the EU average values, Cyprus has lower exits attributed to positive reasons and more exits related to the pandemic. In Greece, the majority of exits was associated with negative reasons (1.9%), whereas the rate for pandemic-related exits was 0.7%. The majority of exits in Luxembourg has been associated with positive reasons and only 0.3% has been attributed to the pandemic.

This Section presented the perceptions on entrepreneurial activity, the actual entrepreneurial activity as well as its expected impact on the economy and society. Additionally, insights on the impact of COVID-19 pandemic were presented. The results of the 2020/2021 APS survey were compared with data from the two previous years, as well as with corresponding index values of Greece and Luxembourg, both employed as benchmark countries for this report. Where applicable, the average values for the European regional area were also presented. Overall, the results show that Cyprus has had lower levels of entrepreneurs running early-staged as well as established business, which is possibly attributed to the pandemic. On a positive note, compared to the benchmark countries and the EU average, there are more TEA entrepreneurs in Cyprus who view new opportunities arising by the pandemic and less TEA entrepreneurs who view that starting a business is somewhat or much more difficult compared to a year ago.

Figure 3.26: COVID-19 pandemic and reasons for business exit

Reason for exit, % of adults 18–64	Cyprus	Greece	Luxembourg	Europe
Negative, not including COVID-19 pandemic	1.3	1.9	0.9	1.5
COVID-19 pandemic	1.4	0.7	0.3	0.6
Positive	0.5	0.5	1.4	0.7



ENTREPRENEURSHIP IN CYPRUS 2020/2021

ATTITUDES AND PERCEPTIONS | **% ADULTS**

68.1%
KNOW SOMEONE WHO HAS STARTED A NEW BUSINESS

49.7%
IT IS EASY TO START A BUSINESS

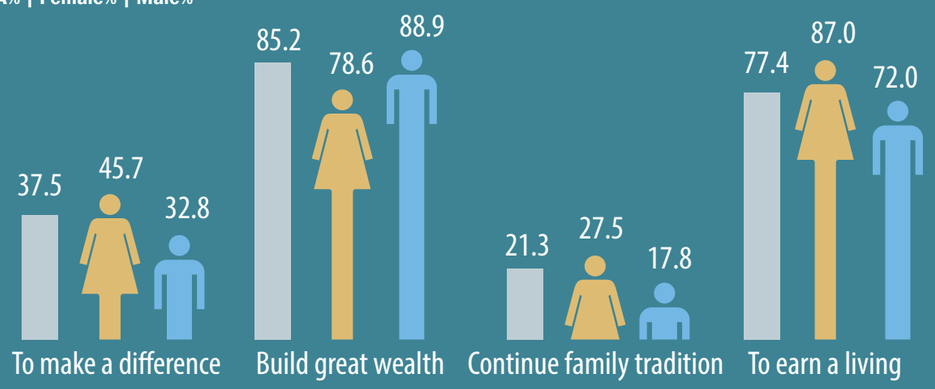
21.1%
GOOD OPPORTUNITIES TO START A BUSINESS IN MY AREA

58.1%
PERSONALLY HAVE THE SKILLS AND KNOWLEDGE

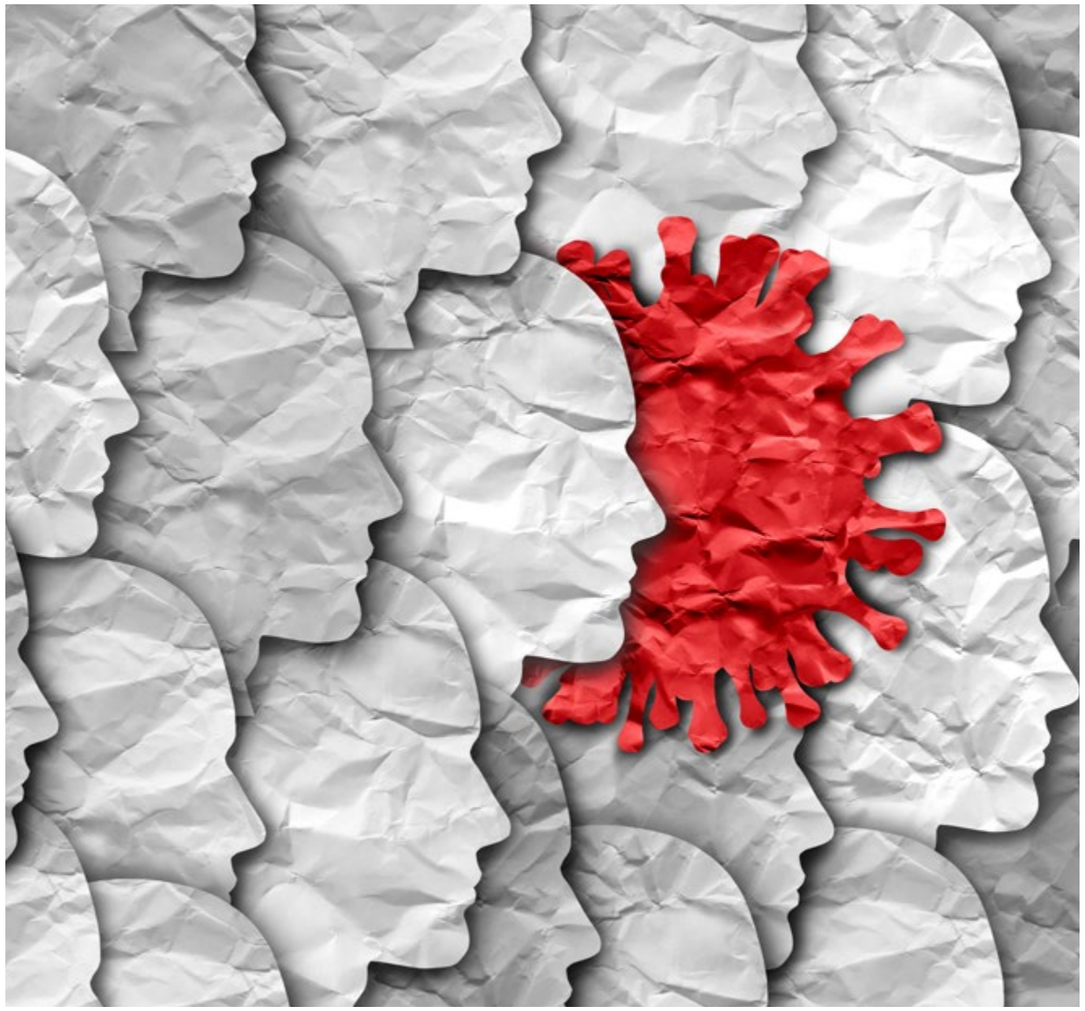
49.1%
FEAR OF FAILURE (OPPORTUNITY)

20.5%
ENTREPRENEURIAL INTENTIONS

Motivation (somewhat or strongly agree)
TEA% | Female% | Male%



THE ENTREPRENEURSHIP ECOSYSTEM

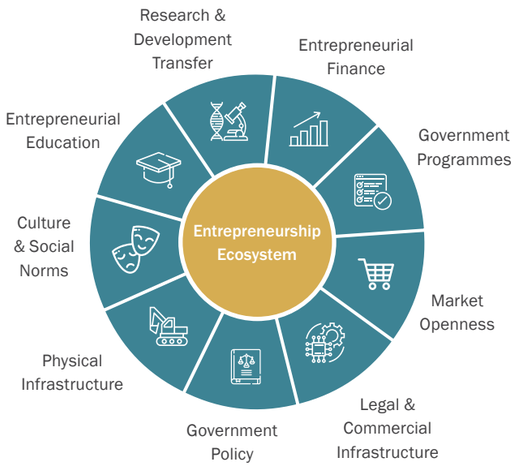


The Adult Population Survey (APS) records the entrepreneurial indexes of each economy. The National Expert Survey (NES), on the other hand, provides useful insights on the strengths and weaknesses of the ecosystem facilitating or hindering the growth of these entrepreneurial indexes. Although entrepreneurial activity may exist even under the most difficult and unexpected circumstances, it may also fail to flourish even in the most favorable conditions. Possibly, the quality of entrepreneurial conditions has an impact on the frequency and level of entrepreneurial activity.

NES reports on the entrepreneurial environment in every economy participating in GEM. NES invites experts to respond to a survey, structured across 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 2020/2021, 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. Figure 4.1 illustrates the EFCs included NES this year.

This Section exhibits the results of NES in Cyprus. The country's national experts are invited to respond by rating each of the conditions to the extent that they support (or constrain) entrepreneurial activity and development, using a 10-point Likert scale. More information on the GEM NES methodology is included in Section 2 of this report.

Figure 4.1: Entrepreneurial Framework Conditions (EFCs)



ACCESS TO ENTREPRENEURIAL FINANCE
Are there sufficient funds available to new startups, from informal investment and bank loans to government grants and venture capital?

GOVERNMENT POLICY: SUPPORT AND RELEVANCE
Do government policies promote entrepreneurship and support those starting a new business venture?

GOVERNMENT POLICY: TAXES AND BUREAUCRACY
Are business taxes and fees affordable for the new enterprise? Are rules and regulations easy to manage, or are they an undue burden on the new business?

GOVERNMENT ENTREPRENEURSHIP PROGRAMMES
Are quality support programs available to the new entrepreneur at local, regional and national levels?

RESEARCH AND DEVELOPMENT TRANSFERS
To what extent can research findings, including those of universities and research centres, be translated into commercial ventures?

COMMERCIAL AND PROFESSIONAL INFRASTRUCTURE
Does access to affordable professional services such as lawyers and accountants support the new venture, within a framework of property rights?

ENTREPRENEURSHIP EDUCATION AT SCHOOL
Are schools introducing ideas of entrepreneurship, and instilling students with entrepreneurial values such as enquiry, opportunity recognition and creativity?

ENTREPRENEURSHIP EDUCATION POST-SCHOOL
Do colleges, universities and business schools offer effective courses in entrepreneurial subjects, alongside practical training on how to start a business?

EASE OF ENTRY: MARKET DYNAMICS
Are there free, open and growing markets where no large businesses control entry or prices?

EASE OF ENTRY: MARKET BURDENS AND REGULATIONS
Do regulations facilitate, rather than restrict, entry?

PHYSICAL INFRASTRUCTURE
To what extent are physical infrastructures, such as roads, Internet access and speed, the cost and availability of physical spaces and such like, adequate and accessible to entrepreneurs?

SOCIAL AND CULTURAL NORMS
Does national culture stifle or encourage and celebrate entrepreneurship, including through the provision of role models and mentors, as well as social support for risk-taking?

As illustrated in Figures 4.2-4.4, NES 2020/2021 revealed the strengths and weaknesses of Cyprus' entrepreneurial ecosystem. Physical infrastructure and commercial and legal infrastructure are two of the local ecosystem's strongest framework conditions, a finding that has been consistent across the years.

Figure 4.2: Entrepreneurial framework condition scores in Cyprus and other countries in 2020/2021

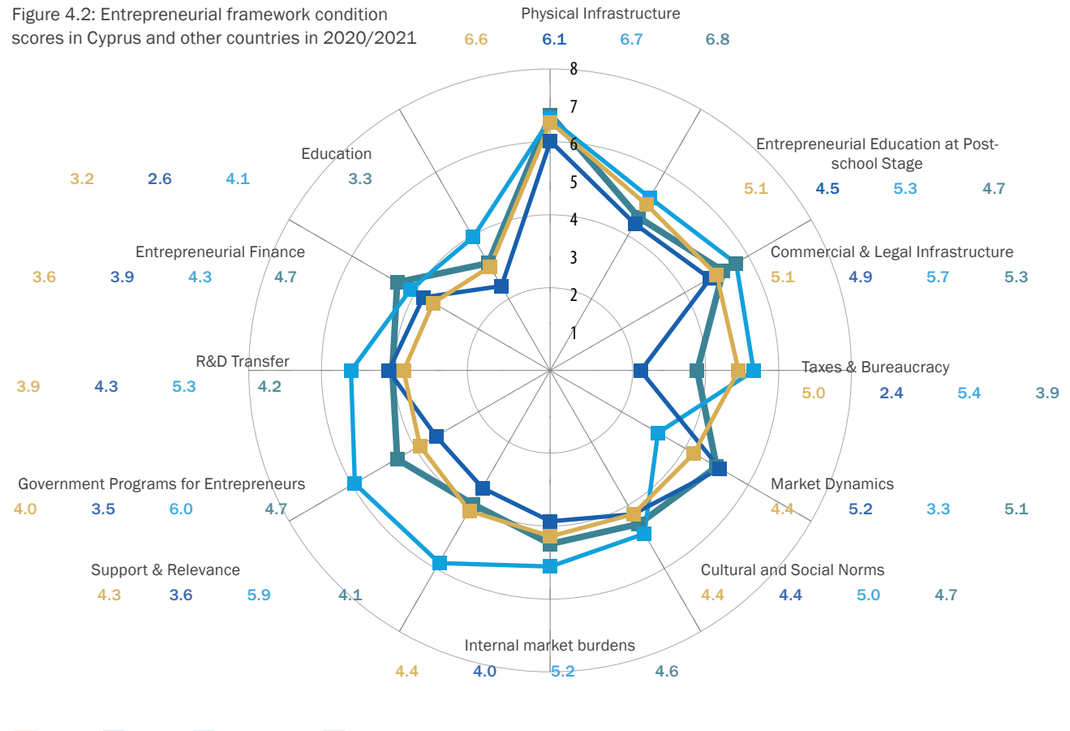


Figure 4.3: Entrepreneurial framework condition scores in Cyprus and other countries in 2020/2021

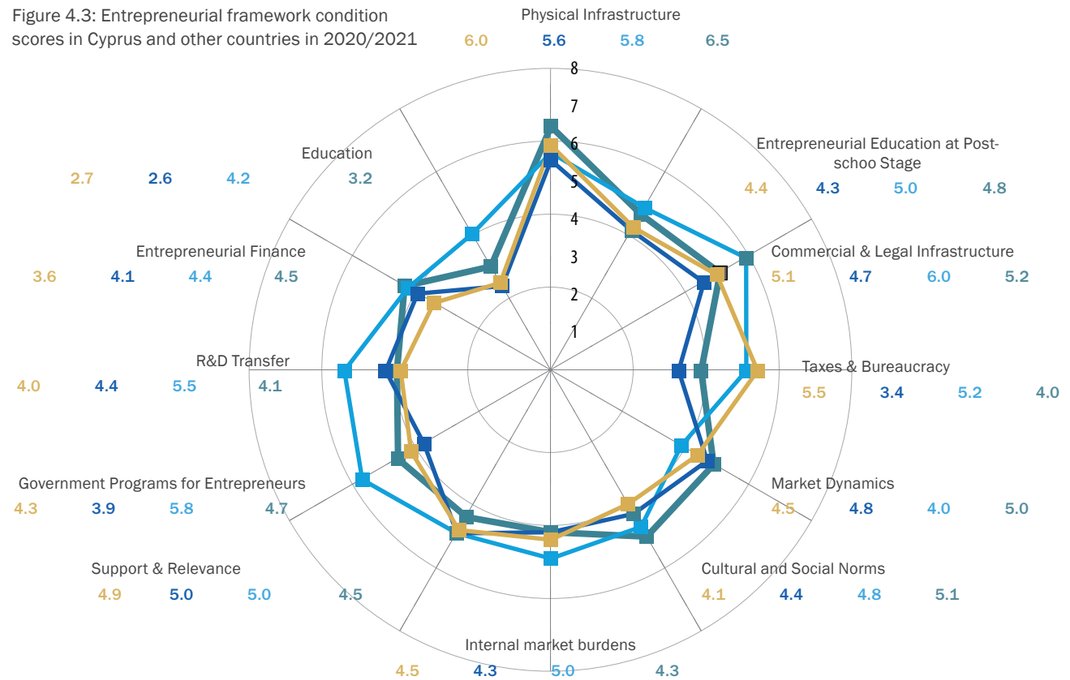
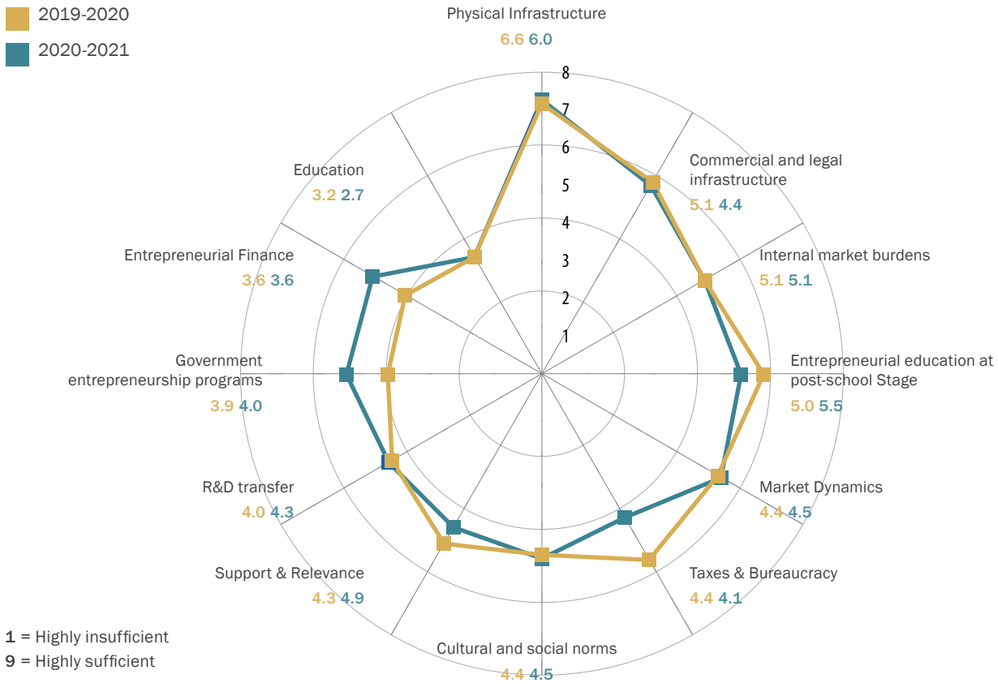


Figure 4.4: Entrepreneurial framework condition scores in Cyprus across the last two years



The results show that, in alignment with the previous years, Physical Infrastructure is widely regarded as supportive to entrepreneurship in Cyprus; it received a rating of 6.0 by the experts, rendering it the most important facilitator of the entrepreneurial ecosystem. Along the same lines, Commercial & Legal Infrastructure and Government Policy on taxes & bureaucracy are also strengths of the ecosystem as they scored 5.1 and 5.5 respectively. The framework conditions which need most attention, as reflected by the scores provided by the experts, are Entrepreneurial Education at School Stage (2.7), Entrepreneurial Finance (3.6), R & D Transfer (4) and Cultural and Social Norms (4.1).

Compared to 2019/2020, this year's results demonstrate improvement on Government Policy on taxes & bureaucracy (from 5.0 in 2019/2020 to 5.5 in 2020/2021), whereas the score on Government Policy: support & relevance has also been increased (from 4.3 in 2019/2020 to 4.9 in 2020/2021). These results demonstrate an overall improvement on Government Policies related to entrepreneurship in Cyprus. On the other hand, despite Physical Infrastructure remaining the most important framework condition, the score for this year has been lower compared to last year (6.0, down from 6.6). Similarly, compared to 2019/2020, Entrepreneurial Education at Post-school stage has also scored notably lower (from 5.1 in 2019/2020 down to 4.4 in 2020/2021).

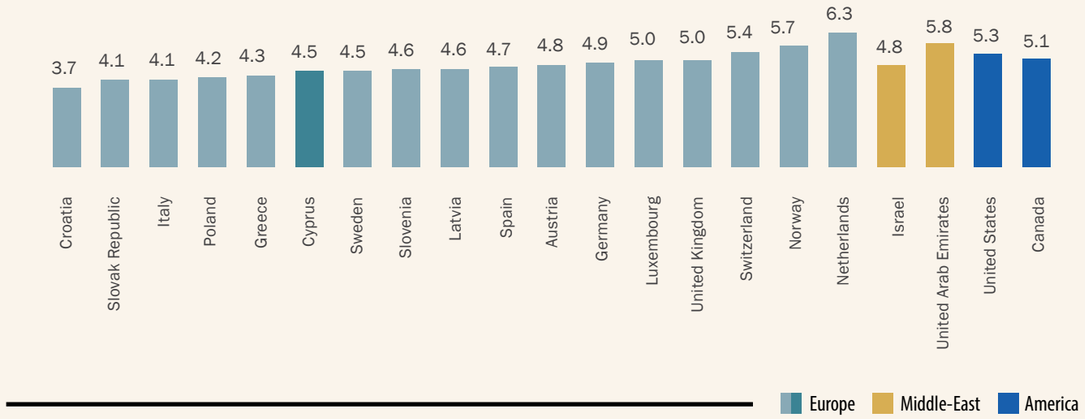
Alongside the comparison to previous years, GEM NES results also enable the comparison with other countries used as benchmark for this report. In particular, Cyprus' score on Government Policy: taxes & bureaucracy is higher compared to Greece (3.4), Luxembourg (5.2), as well as the EU average rate (4), supporting the view that the taxation system and reduced bureaucracy act as facilitators for entrepreneurial activity. Compared to Greece (5.5) and Luxembourg (5.8), Physical Infrastructure scored higher (6). However, this score value is lower compared to the European average rate (6.5). Compared to other countries, the level of Cyprus' Commercial & Legal Infrastructure is higher compared to Greece's (4.7) and the European average rate (5.2) but lower to Luxembourg's (6). Similarly, Cyprus' Entrepreneurial Education at Post-school stage scored slightly higher compared to Greece's (4.3), but lower compared to Luxembourg's (5) and the EU average rate (4.8).

In the recent years, GEM introduced the National Entrepreneurship Context Index (NECI) which, via the use of the arithmetic mean of that economy's EFC scores, summarizes the average state of the ecosystem for entrepreneurship in each economy. The NECI scores for the economies of the European regional area and other selected economies included in the GEM National Expert Surveys in 2020/2021 are illustrated in Figure 4.5. Cyprus' NECI value in 2020/2021 is 4.5. In comparison, that score is lower than the European average value (4.7) and Luxembourg's 5.0 but higher to Greece's 4.3.

The rest of this Section provides more information on the measures used for each of the framework conditions[2].

2 The item values presented for each framework condition are not weighted

Figure 4.5: NECI values for countries of European regional area and other selected economies



4.1 STRENGTHS AND WEAKNESSES OF THE ENTREPRENEURIAL ECOSYSTEM IN CYPRUS

Physical Infrastructure

Cyprus has developed a contemporary physical infrastructure such as road, air and sea transport services. Consistently across the years, the island's physical infrastructure has been rated as the major facilitator of Cyprus' entrepreneurial ecosystem. In particular, the support provided by the physical infrastructure for new and growing firms (regarding roads, utilities, communications and water disposal services), has scored 6.1 in both 2020/2021 and 2019/2020. Regarding access to communications such as telephone and internet, experts perceive good access (7.3 in 2020/2021, down from 7.4 2019/2020). Experts consider that it is possible for new businesses to gain good access to utilities (gas, water, electricity, sewer) within a month (7.5 in 2020/2021, down from 7.8 in 2019/2020). The overall decrease on the score of Physical Infrastructure framework condition is also associated with a decreased score on cost of getting good access to communications (5.6 in 2020/2021, down from 6.0 in 2019/2020). Compared to other countries, Cyprus received higher scores on getting good access to communications in a week (7.3 in Cyprus, 6.1 in Greece, 6 in Luxembourg). However, compared to Luxembourg (7.0) and Europe (6.7), the cost of utilities is less affordable for new businesses. Table 4.1 summarizes the results on Physical Infrastructure for each item.

Cyprus Greece Luxembourg Europe

Table 4.1: Physical Infrastructure

	2018/2019	2019/2020	2020/2021			
	Cyprus	Cyprus	Cyprus	Greece	Luxembourg	Europe
The physical infrastructure (roads, utilities, communications, water disposal) provides good support for new and growing firms	6.3	6.1	6.1	5.4	7.8	6.1
It is not too expensive for a new or growing firm to get good access to communications (phone, Internet, etc.)	5.6	5.3	5.4	4.8	6.7	6.8
A new or growing firm can get good access to communications (telephone, internet, etc.) in about a week	6.8	7.4	7.3	6.1	6.0	7.2
New and growing firms can afford the cost of basic utilities (gas, water, electricity, sewer)	5.9	6.0	5.6	5.6	7.0	6.7
New or growing firms can get good access to utilities (gas, water, electricity, sewer) in about a month	7.3	7.8	7.5	6.2	7.1	7.0

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

Commercial and Services Infrastructure

The availability of commercial and services infrastructure is important for the growth of the entrepreneurial ecosystem. Cyprus' human resources are often found to be highly-trained whereas there exists a large number of law and accounting firms. Even though Commercial and Services infrastructure remains a strength for Cyprus' ecosystem, its overall score has been notably lower compared to the previous years. This is due to lower scores on some of the item-level results of this years' NES. For example, national experts view that there are sufficient subcontractors, suppliers, and consultants to support new and growing firms (5.6 in 2020/2021, 5.0 in 2019/2020). Similarly, they perceive that getting good professional legal and accounting services (5.9 in 2020/2021, 6.1 in 2019/2020) as well as banking services (checking accounts, foreign exchange transactions, letters of credit) in Cyprus is relatively easy (5.7 in 2020/2021, 5.8 in 2019/2020). However, although the ecosystem includes enough subcontractors, suppliers and consultants to support new and growing firms, consistently with last year's results, experts perceive that new and growing firms cannot afford the cost of these services (3.9 in 2020/2021, 4.1 in 2019/2020). As illustrated in Table 4.2, despite the fact that this category is a strength for the ecosystem, the results demonstrate that there is a wider variety of such services in Europe as well as in countries employed as benchmarks. Using subcontractors, suppliers, and consultants is more affordable in the majority of European countries (European average rate is 4.1) as well as in Luxembourg (4.8).

Government Policies

Cyprus' government policies on legal and tax schemes are supportive for new and growing businesses as the country has one of the lowest corporate income tax rates in the European Union. National experts view that taxation is not a burden for new and growing firms in Cyprus (7.3 in 2020/2021, 7.5 in 2019/2020) and consider that taxes for new and growing firms are predictable (7.2 in 2020/2021, 6.0 in 2019/2020), which signals that the entrepreneurial ecosystem in Cyprus possibly enjoys a long-lasting stability with regards to the tax scheme. Experts also consider that the support for new and growing firms is a priority at national government level (5.8 in 2020/2021, 5.5 in 2019/2020); however, they do not support the view that those are treated as a priority at local government level (3.9 in 2020/2021, 3.6 in 2019/2020). Furthermore, experts perceive that it is not easy for new developed firms to obtain the requested permits and licenses within a week (2.9. in 2020/2021, 2.2 in 2019/2020). Compared to other economies, Cyprus' tax scheme seems to be a facilitator for new and growing businesses (7.3), which is in stark contrast with experts across Europe who consider that in the majority of the European countries, taxation is a burden for new and growing firms (4.2). Findings for Greece are even lower (3.6), whereas in Luxembourg the score for the index stand somewhat higher than the EU average (5.3). Along the same lines, taxes and other governmental regulations are applied in a more predictable way in Cyprus (score 7.2) compared to other countries. The corresponding European average is 4.6, whereas the scores in Greece and Luxembourg are 3.3 and 6.5 respectively. Table 4.3 summarizes the findings on this entrepreneurial framework condition.

Entrepreneurial Education & Training

Entrepreneurial education in Cyprus scored lower compared to the previous years on both school-level and post-school levels. In particular, experts consider that the business and management education given at post-school level is not adequate for preparing the population for start-ups and growing firms. Although this item received high scores in the previous years, perceptions have dropped compared to last year (4.1 in 2020/2021, down from 5.6 in 2019/2020). Additionally, experts in Cyprus consider that vocational, professional and continuing education systems do not sufficiently provide adequate preparation for starting up and growing new firms (4.1 in 2020/2019, down from 4.6 in 2019/2020). These results show that post-school entrepreneurial education is not currently a strength of the ecosystem, in contrast with how it used to be in the previous years. Along the same lines, entrepreneurial education at school level remains one of the most important weaknesses of Cyprus' entrepreneurial ecosystem. According to the experts, primary and secondary education in Cyprus lacks adequate activities and classes which would encourage creativity, imagination, vision, self-sufficiency and personal initiative (2.9 in 2020/2021, 3.1 in 2019/2020). Experts also perceive that school-level education does not provide adequate instruction in market economic principles (3.0 in 2020/2021, 3.5 in 2019/2020). Similarly, it is perceived that school-level education does not provide adequate attention to entrepreneurship and new firm creation (2.8 in 2020/2021, 2.9 in 2019/2020). Compared to Europe and Greece, colleges and universities in Cyprus are more supportive in providing adequate preparation for starting up and growing new firms (4.9, compared to EU's 4.6 and Greece's 4.3). Table 4.4 provides an overview of the perceptions of national experts on entrepreneurial education. Compared to last year, this year's overall results on entrepreneurial education show a notable decrease on the education provided both at post-school and school-levels. The rates of all questions relevant to entrepreneurial education are below average, hence indicating that entrepreneurial education in Cyprus is currently not sufficiently cultivating entrepreneurial skills.

Government Entrepreneurship Programs

The overall score for Government Entrepreneurship Programs in Cyprus is low, although there has been improvement compared to the previous years. More specifically, experts consider that the governmental assistance for newly developed and growing firms, which can be obtained through contact with a single agency, remains low (4.1 in 2020/2021, up from 3.7 in 2019/2020). Similarly, despite the fact that the support provided by science parks and business incubators has improved compared to the previous years, experts perceived that it is still limited (4.4 in 2020/2021, up from 4.1 in 2019/2020). Experts view that it is difficult for anyone who needs help from a government program for a new or growing business to find what they are looking for (3.8 in 2020/2021, up from 3.5 in 2019/2020). They also perceive that people working for government agencies are not sufficiently competent and effective in supporting new and growing firms (3.6 in 2020/2021, up from 2.8 in 2019/2020). Compared to Luxembourg, the score on all items of this condition are notably higher. These results are also summarized in Table 4.6, which

Cyprus Greece Luxembourg Europe

Table 4.2: Commercial and services infrastructure

	2018/2019	2019/2020	2020/2021			
There are enough subcontractors, suppliers, and consultants to support new and growing firms	5.5	5.0	5.6	5.7	6.5	5.9
New and growing firms can afford the cost of using subcontractors, suppliers, and consultants	4.1	4.1	3.9	3.4	4.8	4.1
It is easy for new and growing firms to get good subcontractors, suppliers, and consultants	5.0	4.5	4.6	4.1	5.6	4.9
It is easy for new and growing firms to get good, professional legal and accounting services	6.1	6.1	5.9	5.3	6.9	5.7
It is easy for new and growing firms to get good banking services (checking accounts, foreign exchange transactions, letters of credit)	6.1	5.8	5.7	5.2	6.1	5.6

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

Table 4.3: Government policies

	2018/2019	2019/2020	2020/2021			
Government policies (e.g., public procurement) consistently favor new firms	4.4	3.7	5.0	4.4	4.6	4.1
The support for new and growing firms is a high priority for policy at the national government level	5.4	5.5	5.8	5.8	5.8	4.8
The support for new and growing firms is a high priority for policy at the local government level	4.1	3.6	3.9	4.8	4.6	4.6
New firms can get most of the required permits and licenses in about a week	2.4	2.2	2.9	3.5	3.7	3.5
The amount of taxes is NOT a burden for new and growing firms	7.3	7.5	7.3	3.6	5.3	4.2
Taxes and other government regulations are applied to new and growing firms in a predictable and consistent way	6.6	6.0	7.2	3.3	6.5	4.6
Coping with government bureaucracy, regulations, and licensing requirements is not unduly difficult for new and growing firms	4.2	4.1	4.5	3.1	5.5	3.9

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

Table 4.4: Entrepreneurial Education & Training

	2018/2019	2019/2020	2020/2021			
School education						
Teaching in primary and secondary education encourages creativity, self-sufficiency, and personal initiative	3.3	3.1	2.9	2.8	4.3	3.5
Teaching in primary and secondary education provides adequate instruction in market economic principles	3.6	3.5	3.0	2.8	4.2	3.2
Teaching in primary and secondary education pays adequate attention to entrepreneurship and new firm creation	2.8	2.9	2.3	2.3	4.1	3.0
Post-school education						
Colleges and universities provide adequate preparation for starting up and growing new firms	5.2	5.0	4.9	4.3	5.0	4.6
The level of business and management education provides adequate preparation for starting up and growing new firms	6.1	5.6	4.1	5.2	4.9	4.9
The vocational, professional, and continuing education systems provide adequate preparation for starting up and growing new firms	4.4	4.6	4.1	3.5	5.1	4.9

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

includes all the items employed for measuring the government entrepreneurship programs condition. Although Cyprus' overall results indicate minor improvements compared to the previous years, they remain low compared to the European average values. This signals that previous actions may have led to the improvement of this condition; however,further action is needed in order for new and growing firms to experience greater value in our country's state-supported entrepreneurship programs.

Financial environment for entrepreneurship

Financial support for new and growing businesses has been, constantly across the years, the major weaknesses of Cyprus' entrepreneurial ecosystem, despite minor improvements in specific scores. According to the experts, there is not sufficient equity funding available for new and growing firms (4.1 in 2020/2021, 3.8 in 2019/2020). Similarly, experts perceive that there is not sufficient debt funding available for new and growing firms (4.7 in 2020/2021, 4.5 in 2019/2020). Informal investors such as family members, friends or colleagues support for new and growing firms is also limited (4.2 in 2020/2021, 4.6 in 2019/2020). Funding resources made available by Business Angels (3.4. in 2021, 3.5 in 2019/2020) and venture capital funding (2.6 in 2020/2021, 2.5 in 2019/2020) also scored low. According to the experts, there is also scarcity of funding available for new and growing businesses, in the form of initial public offerings (IPOs) (2.6 in 2020/2021 and 2019/2020) and private lenders' funding (crowdfunding) (2.1 in 2020/2021, 2.5 in 2019/2020). Overall, although financial support is limited across the majority of European countries, Cyprus' scores on nearly all items of this framework condition, are lower than the EU average values. In particular, the results demonstrate a notable difference on the EU scores of funding availability from informal investors (4.9), business angels (4.4) and venture capitals (4.4). Similarly, compared to Cyprus, informal investors, business angels and venture capitals in Greece and Luxembourg seem to be more open to fund new and growing business ventures. Compared to these countries as well as the European average, there seem to be more government subsidies available in Cyprus We note that this might signal that private investors in Cyprus are less familiar or less open to consider such investments. On a positive note, experts' perceptions seem to have slightly improved regarding the availability of sufficient government subsidies for new and growing firms (5.4 in 2020/2021, 5.1 in 2019/2020). All items employed for measuring this framework condition are included in Table 4.6.

Cultural and social norms

Consistently across the years, experts in Cyprus have perceived that cultural and social norms are not sufficiently supportive towards new and growing businesses. Even though the APS results demonstrate, to some extent, that the population is more open towards entrepreneurial career options, possibly the culture of being risk-averse or the social norms partly prevent the population from initiating entrepreneurial endeavors. According to this year's results, the cultural and social norms on entrepreneurship in Cyprus are limited and the overall score of the framework condition has been reduced this year compared to last year. Reflecting on the items employed for measuring expert views on cultural and social norms, experts perceived that the national culture is not sufficiently supportive for entrepreneurs who have succeeded through their own personal efforts. In particular, there has been a reduction on the score of this item compared to the previous year (4.7 in 2020/2021, down from 5.2 in 2019/2020). Similarly, compared to the previous year, the experts provided a lower score regarding the emphasis of national culture on self-sufficiency, autonomy, and personal initiative (4.4. in 2020/2021, down from 4.9 in 2019/2020). The propensity to entrepreneurial risk-taking also remains low (3.2 in 2020/2021, 3.4 in 2019/2020). The results also show that there is limited encouragement for entrepreneurial creativity and innovativeness (3.8 in 2020/2021, 4.1 in 2019/2020). Compared to other European countries, Cyprus' overall scores on cultural and social norms towards entrepreneurship are notably lower. For example, the European average rate on whether the national culture encourages creativity and innovativeness is 5.2. Similar conclusions can be drawn when Cyprus' results are compared to Greece's or Luxembourg's, as the cultural and social norms in both countries 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.

Internal market dynamics and Internal market burdens or entry regulation

The GEM methodology also reflects the internal market dynamics and internal market burdens or entry regulation in each economy participating in the NES study. Experts in Cyprus consider that in Cyprus, the anti-trust legislation is effective and well enforced for new and developing firms (5.4 in 2020/2021, up from 4.9 in 2019/2020). However, they are not very optimistic on whether new and growing firms in Cyprus can easily enter new markets (4.0 in 2020/2021, down from 4.4 in 2019/2020). They consider that it is difficult for new and growing firms to afford the cost of new market entry and that this became even more difficult in the last year compared to the previous years (3.6 in 2020/2021, down from 3.9 in 2019/2020). Their view on whether new and growing firms can enter markets without being unfairly blocked by established firms is also pessimistic, although there has been a slight increase compared to last year's score (4.4 in 2020/2021, 4.2 in 2019/2020). 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 transfer from the academic world to industry can potentially lead to the further development of the entrepreneurial ecosystem and its enhancement with new business ventures, featuring innovative and more competitive products or services. Despite the potential benefits of R&D on entrepreneurial ecosystem growth, R&D transfer in Cyprus remains low. In particular, experts view limited transfer of new technology, science, and other knowledge from universities and public research centers to new and growing firms (3.6 in 2020/2021 and 2019/2020). Experts also perceive that the latest technology is not affordable for new and growing firms in Cyprus (3.4 in 2020/2021, 3.1 in 2019/2020). Similarly, they share the view that new and growing firms have just as much access to new research and technology as large, established firms. Their perception on this criterion

Cyprus Greece Luxembourg Europe

Table 4.5: Government entrepreneurship programs

	2018/2019	2019/2020	2020/2021			
A wide range of government assistance for new and growing firms can be obtained through contact with a single agency	3.5	3.7	4.1	3.6	5.9	4.1
Science parks and business incubators provide effective support for new and growing firms	3.5	4.1	4.4	4.9	5.8	5.5
There is an adequate number of government programs for new and growing businesses	4.1	4.6	5.0	4.6	6.0	5.2
The people working for government agencies are competent and effective in supporting new and growing firms	3.5	3.8	3.6	3.1	6.2	4.7
Almost anyone who needs help from a government program for a new or growing business can find what they need	3.4	3.5	3.9	3.2	5.5	4.3
Government programs aimed at supporting new and growing firms are effective	3.9	4.2	4.9	4.0	5.6	4.6

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

Table 4.6: Access to finance

	2018/2019	2019/2020	2020/2021			
There is sufficient equity funding available for new and growing firms	4.0	3.8	4.1	4.7	4.3	4.6
There is sufficient debt funding available for new and growing firms	4.4	4.5	4.7	3.7	4.7	4.9
There are sufficient government subsidies available for new and growing firms	4.9	5.1	5.4	4.9	5.1	5.0
There is sufficient funding available from informal investors (family, friends and colleagues) who are private individuals (other than founders) for new and growing firms	5.1	4.6	4.2	4.4	5.0	4.9
There is sufficient professional Business Angels funding available for new and growing firms	4.2	3.5	3.4	4.2	4.6	4.4
There is sufficient venture capitalist funding available for new and growing firms	3.2	2.5	2.6	5.2	4.3	4.4
There is sufficient funding available through initial public offerings (IPOs) for new and growing firms	2.7	2.6	2.6	2.9	3.6	3.6
There is sufficient private lenders' funding (crowdfunding) available for new and growing firms	2.8	2.5	2.1	2.9	3.7	4.1

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

Table 4.7: Cultural and social norms

	2018/2019	2019/2020	2020/2021			
The national culture is highly supportive of individual success achieved through own personal efforts	4.9	5.2	4.7	4.8	5.6	5.5
The national culture emphasizes self-sufficiency, autonomy, and personal initiative	4.7	4.9	4.4	5.0	5.1	5.2
The national culture encourages entrepreneurial risk-taking	3.6	3.4	3.2	3.5	3.8	4.5
The national culture encourages creativity and innovativeness	4.1	4.1	3.8	4.0	4.8	5.2
The national culture emphasizes the responsibility that the individual (rather than the collective) has in managing their own life	4.1	4.5	4.5	4.5	4.8	5.2

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

has slightly improved compared to the previous year (4.3 in 2020/2021, up from 3.9 in 2019/2020). However, the support provided to engineers and scientists to commercialize their results is limited (3.8 in 2020/2021, 3.9 in 2019/2020). Also, the support provided by the science and technology base on the creation of world-class new technology-based ventures in at least one area, is perceived as not sufficient by the experts (4.7 in 2020/2021 and 2019/2020). The results also demonstrate that, in comparison, Cyprus' overall R&D transfer is lower than that of Luxembourg, Greece and of other European countries. In particular, there is notable difference on the affordance of the latest technology in Cyprus (3.4) compared to Greece and Luxembourg (both 5.6). Table 4.9 includes the questions employed for measuring research and development transfer.

Cyprus Greece Luxembourg Europe

Table 4.8: Internal market dynamics and burdens

	2018/2019	2019/2020	2020/2021			
The markets for consumer goods and services change dramatically from year to year	4.9	4.5	4.7	5.4	3.7	5.2
The markets for business-to-business goods and services change dramatically from year to year	4.8	4.3	4.8	5.1	3.9	5.0
New and growing firms can easily enter new markets	4.6	4.4	4.0	3.9	4.4	4.7
New and growing firms can afford the cost of market entry	3.9	3.9	3.6	3.5	4.4	4.1
New and growing firms can enter markets without being unfairly blocked by established firms	4.4	4.2	4.4	4.4	5.0	4.3
The anti-trust legislation is effective and well enforced	5.1	4.9	5.4	5.1	5.6	4.5

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

Table 4.9: Research and development transfer

	2018/2019	2019/2020	2020/2021			
New technology, science, and other knowledge are efficiently transferred from universities and public research centers to new and growing firms	3.6	3.9	3.9	3.8	3.8	4.2
New and growing firms have just as much access to new research and technology as large, established firms	4.1	3.9	4.3	3.8	3.8	3.8
New and growing firms can afford the latest technology	5.5	3.1	3.4	5.6	5.6	3.7
There are adequate government subsidies for new and growing firms to acquire new technology	4.1	3.6	3.9	4.1	4.1	3.9
The science and technology base efficiently supports the creation of world-class new technology-based ventures in at least one area	4.2	4.7	4.7	4.6	4.6	4.9
There is good support available for engineers and scientists to have their ideas commercialized through new and growing firms	3.5	3.9	3.8	4.2	4.2	4.3

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

THE NATIONAL EXPERT SURVEY AND THE COVID-19 PANDEMIC

Similarly to the Adult Population Survey (APS), this year's GEM methodology has included additional question blocks on NES to record the perceptions of the experts with regards to COVID-19 pandemic. In particular, GEM NES recorded two key areas: 1) the response of entrepreneurs to the effects of the pandemic, and 2) the response of governments to the consequences of COVID-19. The new items covering these two key areas recorded the expert views on whether the entrepreneurs introduced new ways of doing business, promoting working from home, adjusting their products or services, identifying new opportunities, or are increasing cooperation with other businesses, including on global projects. The items also recorded the views of the experts on government responses to the consequences of the pandemic: whether governments are effectively helping businesses to adjust, are helping to avoid the loss of firms, are effectively protecting workers and customers, and whether governments are increasing digital delivery of regulations.

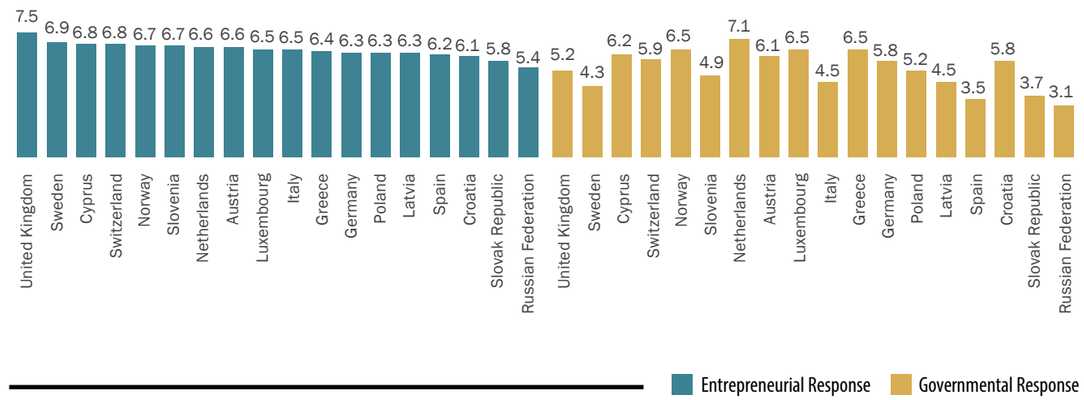
This cross-country comparison highlights that entrepreneurs in Cyprus have been very responsive to the consequences of the pandemic and that they have been more proactive than the government. In particular, Cyprus' entrepreneurs scored 6.8 regarding their proactiveness to the impact of the pandemic. Compared to the rest of countries of the European regional area, entrepreneurs in Cyprus are 3rd in terms of their proactiveness. The national experts also provided a score for governmental response (6.2). Among other 17 governments of European countries, the proactiveness of the Cyprus government holds the 3rd position. In other words, experts highly appreciate the proactiveness of both the entrepreneurs and the government in Cyprus. The high scores on both conditions render it possible that Cyprus' entrepreneurial ecosystem may experience a rapid recovery in the post-pandemic era.

This Section reported on Cyprus' results of NES and compared those to the results of the previous years as well as to the results of Greece, Luxembourg and European average values. A number of key outcomes can be extracted by the presented comparative analysis on the environment for entrepreneurship.

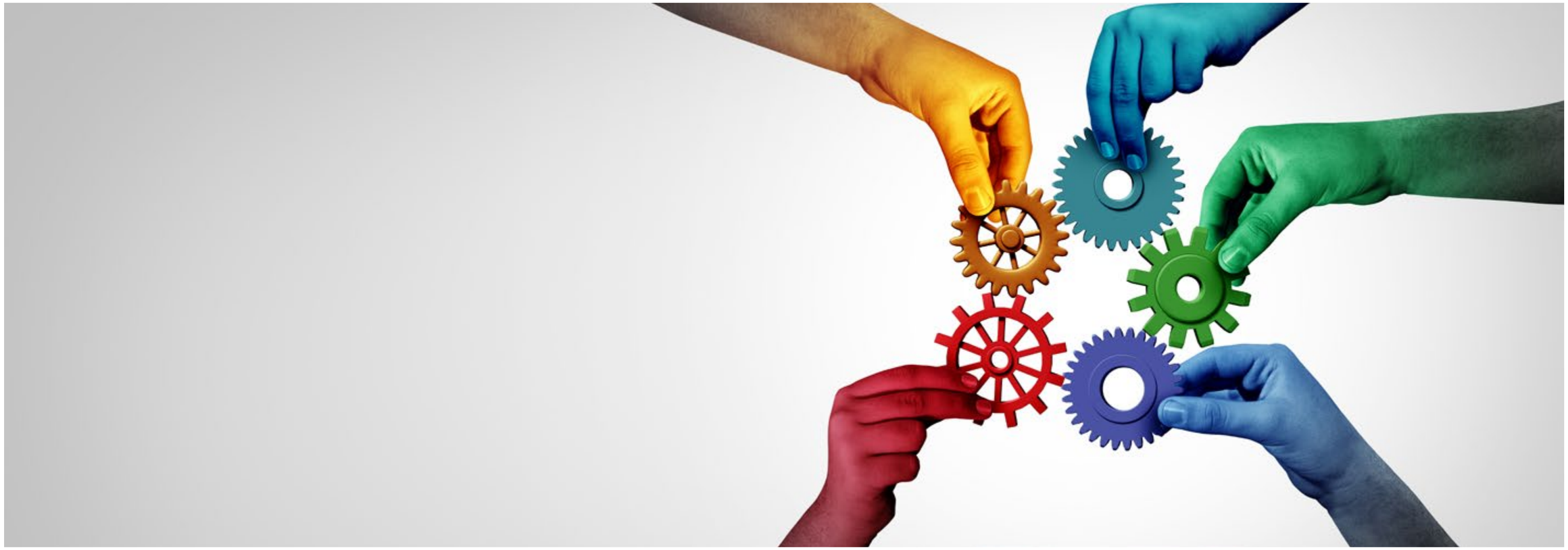
First, from the overall assessment of EFCs in Cyprus and its comparison to the previous, pre-pandemic years, a slight reduction has been recorded, indicating minor deterioration in the environment for entrepreneurship in Cyprus. The strengths of the entrepreneurial ecosystem in Cyprus for 2020/2021 have been its Physical Infrastructure, its Commercial & Legal Infrastructure and its Government Policy on taxes & bureaucracy. Conversely, a number of inhibitors of entrepreneurial activity has been identified by the experts, namely Entrepreneurial Education at School Stage, Entrepreneurial Finance, R&D Transfer and Cultural and Social Norms. Cyprus' NECI value in 2020/2021 has been 4.5.

Second, Cyprus has had a strongly positive entrepreneurial response to the pandemic, as explicitly noted by the national experts' assessments. Along the same lines, the same national experts' ratings of the governmental response to the economic impacts of the pandemic also scored relatively high. Both entrepreneurs and the government in Cyprus have been relatively more proactive compared to other European countries, as Cyprus holds the 3rd position on both entrepreneurial and governmental proactivity. We note that this may signal that the economic recovery of business ventures in Cyprus might be more rapid compared to other business ventures across Europe.

Figure 4.6: - Experts' Assessment Of Responses To The Pandemic (Nothing Proactive = 0; Fully Proactive = 10)



EXISTING POLICIES AND FUTURE POLICY RECOMMENDATIONS



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Cyprus considers entrepreneurship as one of the most important driving forces of economic development, bringing positive implications on a socio-economic level. The COVID-19 pandemic has been disruptive for the economy as well as for businesses and individuals. It has raised many important questions on the ability of entrepreneurs as well as the wider population, to navigate their way through the crisis as the economy was effectively closed down and household incomes were under great stress for the majority of the population. The results of GEM Cyprus 2020/2021 provide a unique opportunity not only to understand the status of the country's entrepreneurial activity opportunity, but also to lift the lid on a range of issues which affected entrepreneurial activity in the midst of the pandemic crisis.

This Section reflects on the GEM Cyprus 2020/2021 results discussed earlier in this report and builds on the policy recommendations presented in the GEM Cyprus reports of the previous years to outline a number of policy recommendations. These are grouped under four categories: Education & Culture, Government & Policies, Financial Support and Business Support.

EDUCATION AND CULTURE

GEM extracts insights on entrepreneurial education at school and post-school level aiming to reflect on the skills and competences of the population. In GEM 2020/2021, entrepreneurial training scored lower compared to the previous years on both school- and post-school levels. This renders entrepreneurial education a weakness of the entrepreneurial ecosystem in Cyprus. Additionally, the imbalance in gender involvement in TEA remains unchanged, while international orientation and innovativeness level of product/services is limited. Results also highlight that most of the businesses have not been able to identify opportunities arising by the pandemic. From a cultural perspective, while perceived capabilities of the population to initiate entrepreneurial activities are at a good level, about half of the population expressed fear of failure associated with entrepreneurial activity. Notably, fear of failure has increased in the midst of the pandemic. This may limit individuals from exploring entrepreneurial career pathways and rather lead them to more secure career options. Along

these lines, experts have stressed the need to “change the culture” and “change the mindset” towards entrepreneurship and to strategically “develop a national culture” which will boost entrepreneurial activity. They also highlight the need to “encourage youngsters to develop the necessary mindset and culture which will enable them to develop entrepreneurial endeavors”. In sum, the results on education and culture signal the need for restructuring education curricula in Cyprus such that individuals can build the necessary skills which in turn will help them develop innovative entrepreneurial ventures. Beyond education, additional and more coordinated actions are necessary for overcoming fear of failure and for enhancing positive societal perceptions towards entrepreneurship. Policy recommendations on education and culture may include, but are not limited, to:

Education at school level:

- Enhancing primary and secondary education with courses which encourage creativity, self-sufficiency, resilience and personal initiative.
- Introducing primary and secondary school students to the basic principles of market economics and financial management.
- Restructuring school-level education with activities which will expose students to entrepreneurship and new firm creation and will provide them the opportunity to gain hands-on experience on developing business ideas.
- Encouraging young girls to learn more about STEM and female entrepreneurship.

Education at university level:

- Enhancing all academic programs to include courses and activities on entrepreneurship and innovation.
- Adjusting academic programs to accommodate university students who are interested in embarking on entrepreneurial journeys alongside their studies.
- Providing additional learning opportunities for university students interested in entrepreneurship, so that they can gain access to relevant knowledge offered by different departments (e.g., digital transformation, IPR management, financial management etc.).
- Developing academically accredited learning opportunities (e.g., short courses) for individuals interested in starting up new businesses or transforming existing firms.
- Encouraging the further development of partnerships and collaborations between Universities and industry.

Education for business owners and individuals:

- Engaging new entrepreneurs (e.g., beneficiaries of young entrepreneurship programs) in training activities on growing and sustaining profitable businesses.
- Offering of training courses targeted towards existing business owners to enhance their skills on problem solving, financial management and digital literacy, such that they can boost their ability to transform existing businesses.

Culture and social norms:

- Raising awareness about successful female entrepreneurs and their entrepreneurial journeys.
- Utilizing popular social media platforms to share entrepreneurial journeys including successful and unsuccessful attempts, and demonstrating unsuccessful attempts as part of the entrepreneurial process.

GOVERNMENT PROCESSES & POLICIES

This year’s GEM NES results, highlight that the creation of new firms are of high priority to the government at national level and this has improved across the years. They also note that the tax regime is not a burden for new and growing firms and that taxes and government regulations are implemented in a consistent and predictable manner. However, government at local level does not sufficiently prioritize entrepreneurship. Experts also consider that government bureaucracy, regulations, and licensing requirements are still difficult and time-consuming for new and growing firms. Such findings have been consistent across the years. They also stress that markets for consumer as well as for business-to-business goods and services change dramatically from year to year and that established firms can sometimes prevent new competitors from entering their markets. Market positioning is also noted by the APS results, highlighting that the majority of businesses in Cyprus target the local or the national market. R&D and technology transfer also remains a weakness of Cyprus’ entrepreneurial ecosystem. New businesses tend to have limited access to the output of Cyprus’ Universities and research centers and that their level of access is lower compared to established firms. Overall, GEM results lead to a set of recommendations on government processes and policies. These may include, but are not limited, to:

Government processes:

- Digitalizing and speeding up all government procedures relevant to businesses and ensuring the coordination of government services.
- Speeding up the development of the Business Facilitation Unit by the government support and simplifying the process for company registration, licensing and employment permits.
- Promoting the services of Cyprus’ Point of Single Contact (PSC) for new businesses and extending its services to include means for instant communication (e.g., call center, instant messaging etc.).

Government policies:

- Disseminating the recent regulation on the commercialization of research results towards the researchers of public universities and encouraging them to commercialize their research results and be able to create spin-off companies.
- Incentivizing Universities and research centers to develop synergies with new and growing businesses aiming at knowledge transfer of technology and science.
- Provisioning of business consulting and support service policies offered by local authorities to digital nomads and foreign start-ups businesses interested in relocating to specific cities in Cyprus.

Government structures & schemes:

- Developing structures that can better support R&D transfer from research to industry (e.g., Tech Parks).
- Generating structures that can provide long-lasting support to female entrepreneurs (e.g., discounted childcare, business support during maternity leave etc.).
- Developing schemes for supporting entrepreneurship-related sabbatical leaves in the private and public sector.

FINANCIAL SUPPORT

Financial support is necessary for the transformation of business ideas into new and growing businesses. The experts interviewed perceive that the Cyprus government has sufficiently supported businesses during the pandemic. However, they view that access to finance remains one of the most important weaknesses of the entrepreneurial ecosystem. They also highlight that despite its improvement compared to the previous years, the support provided by government entrepreneurship programs is still not adequate for new and growing businesses. The experts also raise internal market dynamics as a weakness of the ecosystem as most new and growing firms cannot afford the cost of market entry. It is notable that the majority of the experts freely raised these issues in their answers to the open-ended questions. For example, some of the experts note that it is difficult for new businesses to “get access to finance and identify alternative financial resources”. Overall, consistently across the years, the results show that there is lack of financial resources for new and growing businesses. This signals the need to improve the financial support landscape for businesses in Cyprus. In particular, policy recommendations associated with financial support may include, but are not limited, to:

Investors

- Training local businesses and individual investors in Cyprus on investment options related to entrepreneurship and innovation.
- Incentivizing existing businesses to become angel investors (e.g., recognizing innovation expenses / investments).
- Organizing events in which potential local investors and new businesses can meet each other and establish collaborations.
- Developing government services for consulting and directing new businesses (e.g., on market positioning).

Government entrepreneurship programs:

- Increasing the frequency of open calls targeted towards start-up businesses.
- Building collaboration between the public and private sectors to financially support startups at very early stage (e.g., pre-seed).
- Generating government programs dedicated to supporting high-risk activities associated with entrepreneurial endeavors at a very early stage (e.g., proof-of-concept, feasibility studies etc.).
- Enhancing the existing Cyprus citizenship scheme to provide incentives for international angel investors and venture capitals to invest in Cyprus’ new and growing businesses.

BUSINESS SUPPORT

Physical infrastructure is the most important strength of Cyprus’ entrepreneurial ecosystem. Similarly, Commercial and Services infrastructure remains a strength for Cyprus’ ecosystem, despite receiving a lower score compared to the previous years. Experts note that certain costs such as those associated with subcontractors, suppliers, and consultants are not affordable for new and growing firms. Along the same lines, new and growing businesses cannot afford the latest technology while at the same time there is lack of adequate government subsidies for new and growing firms to acquire new technology. Reflecting on the impact of the pandemic, the majority of new and growing firms in Cyprus highlighted that it led to a delay in getting the business operational whereas only a small number of businesses in Cyprus use technology or processes that are new to the world. Through the open-ended questions, experts also highlighted that there are “difficulties in identifying human talent with the necessary experience and knowledge for helping a startup business” and that there is a need for “supporting businesses in accessing international markets”. Policy recommendations which can assist the business support available to new and growing businesses may include, but are not limited, to:

Entrepreneurship lanscape:

- Releasing policies to support new businesses in shifting towards emerging technologies and using the latest technologies for their key activities.
- Developing schemes that will assist existing businesses to transform their business models for the digital era.
- Establishing agreements with commercial and service infrastructure to offer subcontracting and consulting services to startup companies at lower rates.
- Developing and supporting technology-transfer offices and non-profit incubators and accelerators.
- Provisioning of infrastructure (e.g., marker spaces) and supportive schemes (e.g., access to co-working spaces) for new and growing businesses at local level.
- Creating a national registry for start-up businesses which will facilitate the collection of data on startup performance, achievements and needs.

Extroversion:

- Incentivizing airlines to better connect Cyprus with destinations featuring as leading technology hubs, entrepreneurship and innovation centers, and technology and research parks.
- Developing schemes which will invite national talent with international entrepreneurial experience to connect with and mentor entrepreneurs in Cyprus.
- Promoting the collaboration of local entrepreneurial ecosystems with leading ecosystems in other cities worldwide.
- Formulating schemes for reducing brain drain and attracting the necessary talent (e.g. in the tech sector).

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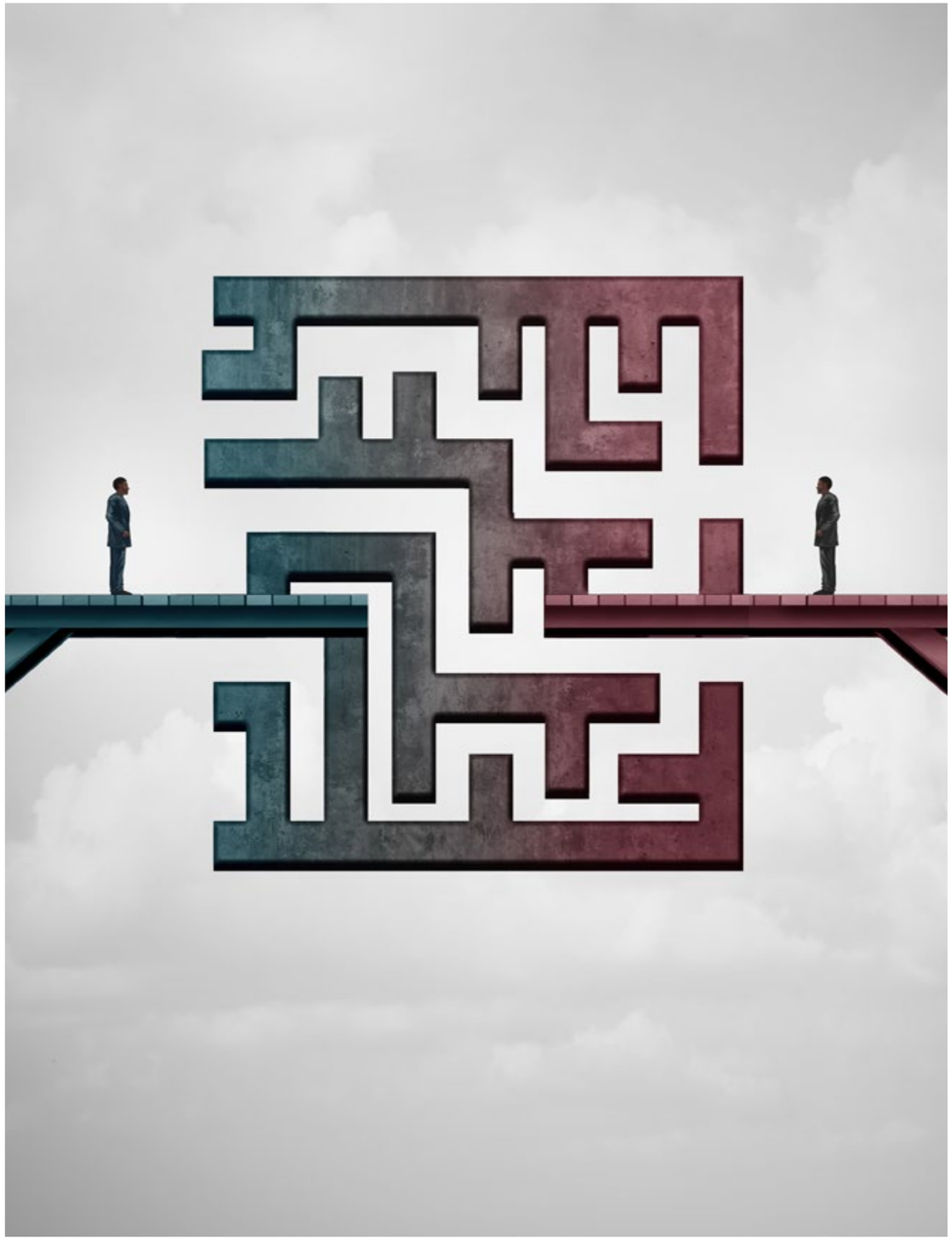

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ART, CULTURE, SCIENCE AND TECHNOLOGY
AT CYENS CENTRE OF EXCELLENCE

INTRODUCTION

One of the main actions taken by the Cyprus government to overcome the economic recession and build an ecosystem that would bring an expanding economical rate comparable to that of the European economy, was to define the smart specialisation strategy areas (S3Cy)* and create the incentives for scientists and entrepreneurs to focus on these areas, with the expectation to yield maximal economic benefits for the country.

***SSP areas of Cyprus Agriculture, Energy, Health, Tourism, Transportation and Construction, and the horizontal priorities of Information Technology and Environment.**

Although the government's actions as well as the reformation of the country's RTDI strategy begun to demonstrate promising results, Cyprus is **still classified as a low-performing R&I country within the European Union**[2].

This is mostly because innovation activities in S3Cy cannot proceed without solid scientific and research foundations. In a recent review, Cyprus is rated as one of the low performing EU member states with respect to the portion of highly cited publications, the number of top research institutions, the number of patent applications, and the total value of ERC grants as a portion of R&D expenses[2].

To overcome this challenge, the Cyprus government, **with support from the European Commission**, facilitated the establishment of Centres of Excellence that foster world-class research activities while at the same time serve as a model for bridging scientific research with innovation outside academia.

THE CYENS RESEARCH AND INNOVATION CENTRE OF EXCELLENCE

One such example is the CYENS Research and Innovation Center of Excellence, established through the support of the European Union's Horizon 2020 Research and Innovation Program (WIDESPREAD – 2016-2017 – Teaming Phase 2). CYENS is a joint venture between Cyprus' three public universities - University of Cyprus, Cyprus University of Technology, and Open University of Cyprus - the Municipality of Nicosia, and two renowned international partners, the Max Planck Institute for Informatics in Germany, and University College London in the United Kingdom.

CYENS's vision has been realized by embracing the motto: **"Inspired by Humans and designed for Humans"**, and even though the center is still in its early years of development, key performance indexes demonstrate a stable progress towards this direction.

In the initial planning of CYENS, the core of the center was mostly consisted by technologically oriented, multidisciplinary research groups (MRGs) with limited input from the Creative Arts Community. Yet very soon, and through the close collaboration with the Municipality of Nicosia, it became clear that CYENS had to find ways to exploit the potentials of the Cultural and Creative Industries to support the country's research, development and innovation.

Accordingly, the concepts of Art, Culture, Science and Technology now form one of the strategic areas of CYENS with the main objective to build a strong network with the support of the Municipality of Nicosia, that will develop applications using emerging technologies and support activities at the intersection of art, culture, science, and technology. The vision is to build an ecosystem where cultural and creative industries co-exist with scientific and research institutions to discover new research avenues, bring novelty and innovation across the industry and address socioeconomic challenges. Moving towards this direction, we run several projects and activities that bring together elements from the intersection of art, science, and technology.

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

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2 *https://ec.europa.eu/newsroom/horizon2020/document.cfm?doc_id=54547*

3 *http://www.cyens.org.cy/en-gb/*

1. “Repairing the Present” for the Regional S+T+ARTS Centers:

The partners of the “Repairing the Present” consortium engage an international group of leaders and artists to rethink and rebuild our world in the light of the climate change crisis and the search for a far more sustainable way of life. A program of S+T+ARTS Experts programs, S+T+ARTS academies, S+T+ARTS expos and S+T+ARTS residencies will create a speculative environment where ICT experts, together with artists, innovative and leading entrepreneurs, and citizens, identify local sustainability challenges and explore the potentialities of new digital technologies and approaches to make their regions more sustainable. “Repairing the Present” cannot reach its ultimate goals without the support and engagement of artists, as they are the critical antennae and creative players of our society. We position artworks as drivers for change and strongly believe that collaborations on the intersection of art, technology and economics create the conditions needed to conceive valuable and responsible innovation opportunities. Last, but not least, “Repairing the Present” thinks globally, but acts locally with activities that address local challenges and make use of the local networks of industries, cultural institutions, foundations, and research institutions.

2. WadsS Garden For ARS ELECTRONICA FESTIVAL 2020

The global circumstances led Ars Electronica to reimagine the 2020 festival format. Numerous events organised by its invited partners were realized at their own locales around the world and were digitally interconnected. Artists, scientists and audiences embarked on a journey through networked biotopes and ecosystems, suggestive of new modes of world-building.

In this spirit and following its own mission, CYENS invited local artists to pollinate the digital by employing a technique derived from gardening: namely, grafting. WADS, a digital garden of commoning formed by 21 local artists, sets out to explore the potential of digital hubs as grounds of artistic and technological co-creation. The digital exhibition is created and experienced in the online environment of Mozilla Hubs and will be accessible through the Ars Electronica Digital Platform.

WADS speaks of plurality and plentifulness, of conjoining principles, disciplines and possibilities. As a virtual space compiled of local artists, it sets out to explore the potential of digital hubs as grounds of artistic and technological co-creation.

3. “Ledra Palace: Dancing on the Line” Exhibition at the Leventis Municipal Museum of Nicosia (June-October 2021)

The Ledra Palace Museum project deals with the representation of difficult history in museums and investigates ways in which technology can help to overcome any obstacles this entails. Despite its decadence, the Ledra Palace Hotel remains a beautiful and interesting place with a history worth to be told. Our aim is to ‘revive’ its history in a more multivocal and multilayered way, through extensive archival research, as well as layered collection of testimonials (interviews and crowdsourcing).

This project is mostly based on the notion that museums dealing with difficult heritage can use technology to facilitate participatory and collaborative approaches, and actively engage different groups and communities (especially excluded,

Figure 1 STARTS project - Credit: Off Grid, by Andrew Styan—STARTS Prize Nomination 2018

Figure 2 CYENS participation at the Ars Electronica Festival - WADS project

Figure 3 Interactive book at the Ledra Palace Exhibition

Figure 4 TVs with interviews at the Ledra Palace Exhibition

marginalized, or silenced ones) in order to tell contested histories. We are therefore interested in stories of people who experienced the Ledra Palace hotel in different ways or capacities: as guests, as audience in a concert or a show, as participants in conferences, business, or work meetings, as employees, or as soldiers. Since this could not be done on the actual hotel site, we tried to create a museum ‘in the wild’ with the use of interactive media and new technologies.

For the purposes of this exhibition, CYENS worked with two Multidisciplinary Research Groups of CYENS Centre of Excellence, one with expertise in history and museum studies (Museum Lab) and the other with expertise in emerging technologies (ITICA), while in close collaboration with the Leventis Municipal Museum of Nicosia for the design of the applications. The installations created for the Ledra Palace exhibition include immersive Virtual Reality [VR] experiences and Augmented Reality [AR] interactions.

4. Enhancement of Heritage Experiences: The Middle Ages Digital Layered Models of Architecture and Mural Paintings over Time (EHEM)

The project aims to obtain virtual reconstructions of medieval artistic heritage ¬architecture with mural paintings¬ that are as close as possible to the original at different times, incorporating historical¬ and artistic knowledge and the diachronic perspective of heritage, as an instrument for researchers, restorers and heritage curators and also to improve the visitors’ perceptions and experiences.

In the digital models elaborated, we intend to develop, as concrete objectives:

1. The understanding of architectural complexity, which is usually regularized geometrically;
2. Solving chromatic problems;
3. Raise and propose the resolution of lighting problems; and
4. To digitally approach the different perspectives of the medieval building and its paintings according to the categories of users.

EMEM is funded under RESTART 2016 – 2020 – «European Initiatives – National Development» (Join Programming Initiative “Cultural Heritage and Global Change: A New Challenge for Europe” – JPICH “Conservation, Protection and Use” Call). The project is coordinated by the Universitat de Barcelona and the consortium consists of the CYENS Centre of Excellence, Università degli Studi Roma Tre and Università degli Studi della Tuscia.

5. Bringing Historic Famagusta to life for school-aged children (Stage 1)

The Cyprus Institute and CYENS Centre of Excellence has collaborated on the “Othello Tower” project, for the development of an educational game that addresses aspects of the history of the walled city of Famagusta. Using interactive technologies and game-based learning, the aim is to increase awareness of, and appreciation for EU-renovated sites in the historic walled city. This project included the delivery of 3D documentation, immersive visualization, 360 demo video, game design and prototype of the “Othello Tower”.

Figure 6 View of the Ledra Palace Exhibition

Figure 5 Interactive Table at the Ledra Palace Exhibition

Figure 7 Engleistra of Saint Neophytos -virtual reconstruction for EHEM project

Figure 8 Screenshot from Othello’s educational game

6. ReInherit

Redefining the future of cultural heritage, through a disruptive model of sustainability

ReInHerit aspires to disrupt the current status quo of communication, collaboration and innovation exchange between museums and cultural heritage sites, in a sense that it will connect cultural heritage collections and sites, and present Europe's tangible and intangible heritage to citizens and tourists in their wider historical and geographical contexts. The ReInHerit project is proposing a very innovative model of sustainable heritage management, through which a dynamic network will be born; this network comprised of cultural heritage professionals, innovation and cultural heritage solution tech experts, researchers, national museums, regional and local museums, and representative managers of Heritage Label sites. The project is also supported externally, by relevant municipalities, regional and local museums, which will also enhance the communication and cooperation of the cultural heritage sector across the EU and beyond.

The ReInHerit proposed model will be based on the development of a digital cultural heritage ecosystem, where all the key stakeholders (museums, heritage sites, policy makers, professionals and communities) will have an open and collaborative space to experiment, share and innovate. This will be achieved through the creation of an innovative Digital Hub. Tools and resources (on training, tourism, conservation, preservation, knowledge creation, content use/reuse, illicit trafficking of goods) necessary for sustainable management will be shared through the digital platform that will host the ecosystem. This ecosystem will also be the experiential open-ended space that will support and generate entrepreneurial initiatives, knowledge produced through co-creation, curation of digital content and visitor experiences. The proposed work plan includes a variety of key activities that will enable the collaboration of museums and cultural heritage sites in real-time.

Figure 9 The ReinHerit project - https://reinherit.eu/

7. CYENS Thinker Maker Space

CYENS Thinker Maker Space is a multifunctional creative space that works towards providing support and building collaborations with local entrepreneurs, designers, artists and researchers. The aim is to support the creative local community to develop projects relating to technology-led innovation and digital fabrication techniques that can eventually lead to prototype. More specifically, makerspace members can have access to:

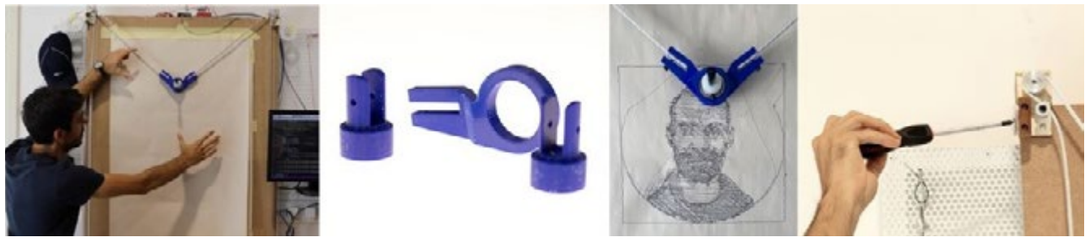

Figure 10a and 10b:Prototyping and fabrication lab at CYENS Thinker Makerspace

- 3D printing - FDM and SLA printers;
- Electronics and Robotics;
- Laser cutting;
- CNC Router;
- Workstations - 3D Scanning, Carpentry, Photography and finishing stations; and
- An exhibition area in the centre of Nicosia with AR/VR/XR capabilities.

In addition, the Thinker Maker Space runs the Artist-in-Residency program. Through this program, the makerspace hosts several short-term basis residencies ranging from two weeks to six months. Resident artists have full access to the makerspace facilities, allowing experimentation with advanced production methods. Under the guidance and the support of the makerspace staff, they work on their own personal projects. At the end of the residency program, the artists can present and exhibit their work at the exhibition space situated at the centre of Nicosia.

The Entrepreneurial dimension of the center related to the activities from the Cultural and Creative Industries:

Activities from the *Cultural and Creative Industries* associated with research and technological development can help to promote the innovation, employability, and competitiveness of EU on the global stage . Such activities lie in a wide spectrum of areas, like the arts, culture heritage, business and technology, advertising and marketing, architecture, photography, product design, graphic and fashion design, film, TV, software, museums, galleries and libraries, video games and others.

Creative assets integrated with technological advancements have a high potential to translate 'creativity' into 'economic value' and are fundamental components for the European Union's economic development with significant impact in wellbeing, active citizenship, common values, social inclusion and intercultural dialogues development .

Specifically:

- More than **12 million workers** (or 7.5% of the European workforce) are employed in the Cultural and Creative Industries with approximately a 500-billion-euro contribution to GDP5.
- Cultural and Creative Industries significantly contribute to **youth employment** and **gender equality**. Importantly, it has proven to be a **remarkably resilient industry** in the context of the economic crisis.
- Many examples from large projects of the industry have demonstrated that input and influences from the Arts can inspire novel and innovative solutions with societal impact.

It is widely acknowledged that artists and professionals from the Cultural and Creative Industries play an important role in innovation and science in our society. Yet, innovation and scientific research in the Cultural and Creative Industries require practice-based and evidence-based interdisciplinary synergies.

Especially now, as the world emerges from the most severe health crisis in living memory, it is crucial that we reimagine innovation while sowing the seeds for a more sustainable future. This, however, will require concerted efforts and determination. There is an urgency for a paradigm shift in economic thinking and a human interest in more purpose-driven alternatives. This requires new forms of acquiring knowledge, new actors to contribute and new types of entrepreneurships.

A more holistic approach is therefore promoted in CYENS, that develops ecosystems where cultural and creative industries co-exist with scientific and research institutions with high expectations to:

- discover new research avenues;
- bring novelty and innovation across different industries; and
- address socioeconomic, cultural, and environmental challenges that affect Europe in the context of globalization and digitization.

4 European Creative Industries Alliance: A new policy agenda to maximize the innovative contributions of Europe's creative industries. November 2014 http://eciaplatform.eu/

5 https://s3platform.jrc.ec.europa.eu/documents/20182/84453/120420_CCI_Policy_Handbook_(FINAL).pdf Working group of EU member states experts on cultural and creative industries. How can cultural and creative industries contribute to economic transformation through smart specialisation? April 2012

6 https://ec.europa.eu/culture/policy/cultural-creative-industries_en

7 https://ec.europa.eu/programmes/horizon2020/en/news/eu-funded-h2020-fet-projects-link-arts-and-science

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