REPORT 2022/2023

Global Entrepreneurship Monitor Luxembourg

GEM

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Executive summary

Entrepreneurship is widely recognized as a key driver of job creation, technological advancement, and overall economic growth. As a result, policymakers have been actively designing programs to support and encourage entrepreneurial efforts worldwide. The Global Entrepreneurship Monitor (GEM) initiative, launched in 1999, collects cross-country data to better understand entrepreneurship and provide evidence for policy actions. The GEM surveys are conducted annually in many countries, and are harmonised to provide insights into entrepreneurial activities, features and traits of entrepreneurs, and entrepreneurial ecosystems. Luxembourg joined the GEM project in 2013. The current report marks the tenth anniversary of GEM Luxembourg, and takes stock of ten years of data collection to present unique information on the intensity and evolution of entrepreneurial activities in the country since 2013.

The last three years were marked by multiple shocks, including the COVID-19 pandemic, the emergence of geo-political conflicts, and the resurgence of high inflation, with its impact on credit conditions. In this context, GEM data allows us to describe recent trends in entrepreneurship, and helps us gauging the consequences of the new global environment on entrepreneurial activities and entrepreneurs.

GEM Luxembourg 2022/2023 describes entrepreneurship in Luxembourg over the last ten years. What's more, it offers a view of how the pandemic years have affected entrepreneurship in the country, showing that entrepreneurial activities in the country have declined since 2019, both in absolute terms and compared to other European countries. There are, however, positive signals of recovery stemming from entrepreneurial intentions and entrepreneurs' evaluation of the Luxembourg's ecosystem.

The main takeaways of this report are as follows:

Early-stage entrepreneurial activity (TEA) in Luxembourg decreased more than in Europe. TEA, the GEM key indicator of early entrepreneurial intensity, is the share of individuals involved in starting *or* running a new business. The TEA rate for Luxembourg dropped from 10.2% in 2019 to 6.9% in 2022, the lowest point since GEM data collection began. The decline of TEA was steeper in Luxembourg than

in Europe, where the European average decreased from 9.4% in 2019 to 8.7% in 2022.

The slowdown in TEA is found across socio-demographic groups. The report finds persistent disparities in entrepreneurial activity across gender, education, and immigration status. In 2022, TEA is lower among women than men (5.3% versus 8.4%), while individuals with a high level of education (10%) and immigrants (8.2%) show a higher propensity to engage in entrepreneurship.

Necessity-driven entrepreneurship increased while opportunity-driven entrepreneurship decreased. The motivations of entrepreneurs have changed over European average of 37%.

Contents

1 Introduction

The Global Entrepreneurship Monitor (GEM) is an international research programme launched in 1999 to collect data and study entrepreneurship. STATEC has joined this endeavour and, in collaboration with Luxembourg's Ministry of the Economy and the Chamber of Commerce, has been conducting the GEM survey for Luxembourg since 2013. This year marks the tenth anniversary of GEM Luxembourg. Ten years of GEM data provide unique information on the intensity and evolution of entrepreneurial activities in Luxembourg. What is more, GEM provides information on individual traits of entrepreneurs, the challenges they face, their attitudes and perceptions, and the context in which they operate, including the policy environment.

The current economic environment is characterised by multiple crisis and considerable uncertainty. The outbreak of the coronavirus pandemic in early 2020 represented an unprecedented exogenous shock, which caused a sudden and deep worldwide economic contraction. While the magnitude of the contraction in economic activity was sizeable, the nature of the downturn was different compared to past recessions, as it was not accompanied by frozen credit and equity markets. What is more, governments' aides and measures helped preventing massive job losses and bankruptcies. Since then, economies worldwide have bounced back. However, the recovery has been accompanied by emerging geopolitical tensions and inflationary pressures, linked to supply chains issues and increasing energy and raw materials' prices. As a result of inflation, interest rates have started rising, affecting, in turn, credit conditions for consumers and businesses. Additionally, the effects of climate change and disruptions from extreme weather patterns are becoming apparent and bear economic consequences. Inevitably, all this represents a major challenge for entrepreneurs and business ventures.

Assessing the impact of an economic crisis on entrepreneurship is difficult. This is because there are several "forces" at play. Different types of entrepreneurship respond differently to the various stages of the business cycle. (Necessity-driven entrepreneurship typically increases during downturns, while opportunity-driven entrepreneurship rises during expansions.) Recessions are also seen as times of creative destruction, whereby new business opportunities arise and innovative firms are created. At the same time, downturns come with risks of reductions in start-up creation, and in the growth prospects of small and medium enterprises, which can

ultimately lead to a decline in aggregate employment, innovation, and economic growth. Missing generations of firms might lead to a persistent decline in new ventures. In the background, the last two decades have been characterised by a slowdown in business dynamism — which is, in turn, linked to entrepreneurship.

In the last two years, GEM Luxembourg has documented the impact of the severe economic shock caused by the pandemic on entrepreneurship. Luxembourg featured a contraction of TEA activities and entrepreneurial intentions, accompanied by pessimistic views on business opportunities and entrepreneurial firms' growth prospects. At the same time, entrepreneurs envisioned new opportunities, and the share of opportunity-driven entrepreneurs has remained stable.

In this context, the GEM Luxembourg report 2022/2023 takes stock of ten years of GEM data to illustrate aspects of the evolution of entrepreneurship in Luxembourg. To this purpose, we use the Luxembourg GEM dataset, since its inception to the latest available observations for 2022, including the COVID special modules, and the cross-national dataset compiled by the global consortium. The use of both datasets provides additional reference points for the assessment of entrepreneurship trends and features in the country. Moreover, the arrival of new data provides additional insights, and possibly the necessary lag, to improve the assessment of the impact of the pandemic on entrepreneurship, with the caveat that recent tensions might act as confounding elements.

The GEM framework describes entrepreneurship as a "cycle" - "*from conception of entrepreneurial opportunities to its maturity or, alternatively to its demise*" (GEM, 2018b, p. 21). Following this framework, the current report presents key indicators of entrepreneurship at the various stages of the process, from intentions to nascent and established entrepreneurs, to conclude with exit.

This report is structured as follows. Chapter 2 presents the GEM conceptual framework. This underpins the data collection and shapes the structure of the reports. It also provides a general description of the surveys and GEM main indicators. Chapter 3 illustrates the evolution of entrepreneurship in Luxembourg over time using data from the 2013 – 2022 waves of the GEM Adult Population Survey (APS). The chapter also describes individual characteristics, motivations for engaging in entrepreneurship, and perceptions of the business environment of the country's entrepreneurs. We place emphasis on changes occurred during the pandemic. We report on Luxembourg's entrepreneurs' views of the country's ecosystem and of the government response to the pandemic. We conclude the chapter by presenting data from administrative sources and STATEC's business demography, which provide information on recent trends in Luxembourg's business dynamism, an aspect related to entrepreneurship. Chapter 4 presents a cross-national analysis of entrepreneurship

conducted on global GEM data, specifically the 2019 and 2022 waves of the harmonised APS. We describe how Luxembourg's entrepreneurship compares to other countries, which provides additional insights on the country's recent entrepreneurial trends. Finally, chapter 5 reports on the GEM National Expert Survey (NES), which delivers a qualitative description of the national entrepreneurial ecosystem according to experts' evaluation.

The data reveal:

- A generalised and persistent decrease in early stage entrepreneurship (TEA);
- The slowdown in TEA is found across socio-demographic groups, but seems more pronounced for those groups that have sustained entrepreneurial dynamics in the past, namely foreign nationals and individuals with higher education levels;
- Individual features, attitudes an traits of entrepreneurs tend to remain stable over time;
- The gender gap persists;
- During the pandemic, necessity-driven entrepreneurs have increased, while opportunity-driven have decreased slightly, but remain comparatively high;
- The business environment is perceived as more challenging. Far fewer people declare that there are good opportunities to start a business compared to the pre-pandemic. Entrepreneurs think that starting a business is becoming more difficult and that growth prospects for businesses are deteriorating;
- There are signs of recovery, with a rebound in entrepreneurial intentions and established entrepreneurship;
- Entrepreneurial intentions and nascent entrepreneurs are comparatively high in Luxembourg;
- Luxembourg's entrepreneurs are satisfied with the government response to the pandemic, and perceive that obstacles to entrepreneurship have eased over time;
- There are signs of dynamism as entrepreneurs perceive the emergence of new opportunities.

Table 1.1 summarises selected key GEM indicators, their trends compared to the 2019 benchmark, and Luxembourg's rank among European countries participating in GEM.

Table 1.1: Dashboard of key GEM indicators

	Luxembourg		Europe		Luxembourg's Rank		
	2022	2019	2022	2019	2022	2019	Change
1. Perceptions							
Good business opportunities	52.4	58.0	50.1	54.3	7^{th}	5^{th}	🟡
Knowledge and skills	50.0	48.5	50.6	51.1	6^{th}	11^{th}	🟢
Fear of failure	44.1	45.6	45.5	39.4	9^{th}	4^{th}	🟢
2. Activities							
Nascent	13.7	15.1	10.3	11.0	3^{th}	3^{th}	🟡
TEA	6.9	10.2	8.7	9.4	10^{th}	5^{th}	🔴
EBO	5.2	4.7	7.2	8.2	11^{th}	13^{th}	🟡
3. Motivations							
Opportunity-driven TEA	55.8	60.5	42.6	45.2	2^{nd}	1^{nd}	🟡
Necessity-driven TEA	46.5	38.3	55.6	46.3	11^{nd}	11^{nd}	🟡
4. Exit and future intentions							
Discontinued business	2.7	2.3	2.4	1.9	6^{th}	5^{th}	🟡
Future entrepreneurial intentions	19.1	18.4	14.6	16.2	4^{th}	4^{th}	🟡

Source: 2022 and 2019 GEM Global APS data. Note: all figures are expressed in percentage of the adult population, except for opportunity-driven and necessity-driven which are expressed in percentage of TEA. The column "Rank" reports Luxembourg's position out the 13 European countries for which GEM data are available for both years. The column "Change" reports whether Luxembourg's position in the ranking is "better" (green dot), stable (yellow) or "worse" (red) in 2022 compared with 2019. A green (red) dot is assigned when Luxembourg gains (loses) more than two ranks. Annual variations equal or below two ranks are assigned a yellow dot. For all indicators, moving up in the ranking is seen as an improvement, except for fear of failure, necessity-driven TEA, and business discontinuation. This is done to facilitate the reading of the table, even if there is no consensus on the optimal level of these indicators.

2 The GEM research approach

Entrepreneurial activities are essential drivers of job creation, and contribute to generating and diffusing new technologies, thus indirectly fostering productivity gains and overall economic activity (Carree and A. R. Thurik, 2010). As a result, entrepreneurship is widely regarded as a key ingredient of economic prosperity, and is the target of numerous policy initiatives around the world. (According to Bai et al., 2022, between 2010 and 2019, worldwide governments' entrepreneurial finance programs had an average cumulative annual budget of 156 billion US dollars.) In this context, the Global Entrepreneurship Monitor (GEM) project was established in 1999 at the London Business School (UK) and Babson College (US) to collect data and study entrepreneurship, with the goal of assessing outcomes and impact on economic development, and identifying the conditions for thriving entrepreneurs. Based on qualitative and quantitative surveys conducted by national teams in many countries, GEM provides a harmonised dataset at annual frequency, which enables researchers and analysts to investigate entrepreneurial activities adopting a cross-national perspective. Since its inception, the GEM project has grown from a consortium of 10 participating countries to involving researchers from over 120 different countries. GEM is now regarded as a prominent longitudinal study of entrepreneurship. Based on 49 participating countries in 2022, the consortium published its 24th annual global report (GEM, 2023).

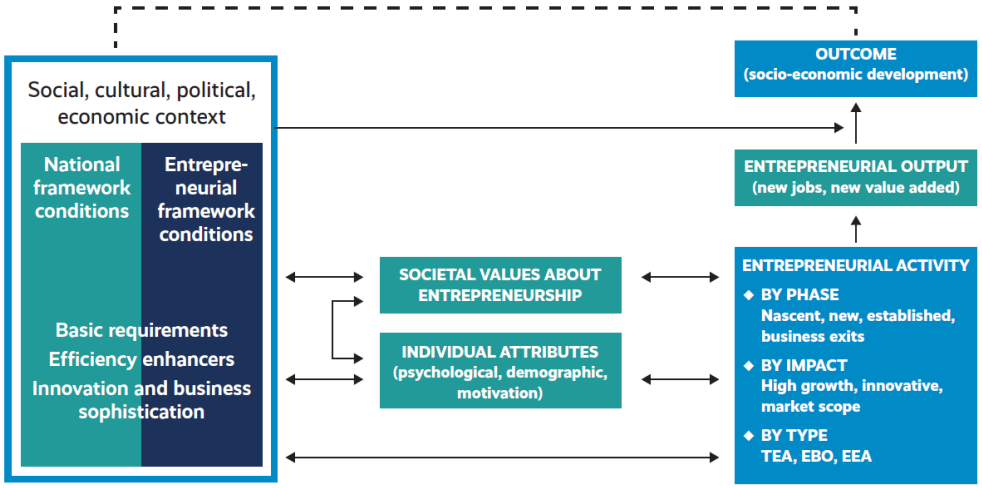
Luxembourg joined the GEM project in 2013. Since then, the two GEM Surveys - the Adult Population Survey (APS) and the National Experts Survey (NES) - have been administered on samples of the country's residents and panels of experts every year. The 10th APS and NES Luxembourg surveys, whose results are documented in this report, have been conducted in May and June 2022, respectively on a sample of 2,023 individuals, and by interviewing 36 experts.

This chapter presents the GEM conceptual framework, which underpins the data collection and the analysis of this report, and provides a general description of the surveys and GEM main indicators. The framework comprises a definition of entrepreneurship, and a set of multi-directional relations between the entrepreneurial endeavour and its context. Entrepreneurship itself is seen as a cycle rather than a constant activity of an individual.

2.1 The GEM conceptual framework

GEM defines entrepreneurial activity as "any attempt at new venture or new business creation, such as self-employment, a new business organization or the expansion of an existing business, by an individual, a team of individuals, or an established business" (Bosma et al., 2020, p.22). Entrepreneurial activity, however, should not be regarded as a purely individual endeavour. One of the main features of the GEM conceptual framework is that entrepreneurial activity does not take place in a vacuum, but rather within the specific context of a given environment, with its own social, cultural and economic characteristics. Entrepreneurial activity is then jointly determined by the interaction between traits and characteristics of entrepreneurs and the overall "environment". In turn, entrepreneurial outcomes affect firm and job creation, innovation, and ultimately economic growth. The GEM conceptual framework outlined in Figure 2.1 portrays the relationship between entrepreneurship and its local, regional and national environment. To provide a comprehensive account of entrepreneurial activity and the context in which it takes place, GEM administers two surveys: the Adult Population Survey (APS) which captures the attitudes, behaviours and expectations of individual adults, and the National Expert Survey (NES) which focuses on the entrepreneurial context (see Section 2.2).

Figure 2.1: The GEM Conceptual Framework



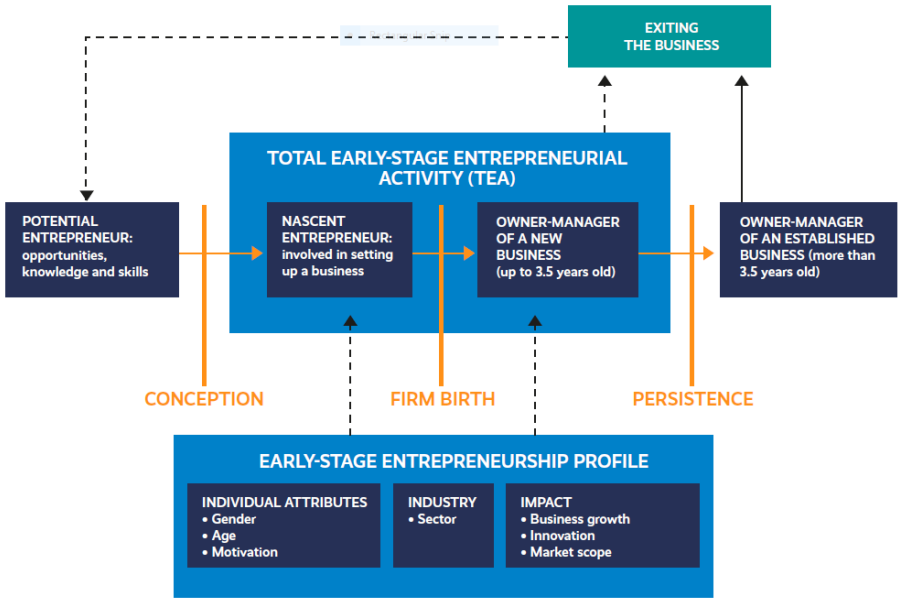
Source: Bosma et al., 2020.

An additional feature of the GEM framework is that entrepreneurship is described as a "cycle" - "*from conception of entrepreneurial opportunities to its maturity or, alternatively to its demise*" (GEM, 2018b, p. 21). GEM surveys are shaped by this framework, and are designed to track people along the entrepreneurship process to provide indicators of entrepreneurial activities. To this end, every person engaged in any activity related to the creation of a new business is regarded as having an impact

on the national level of entrepreneurship. Figure 2.2 depicts the entrepreneurial process, and the corresponding operational definitions adopted by GEM for each stage of the process. Individuals along the various stages of the entrepreneurial process are characterized as follows: i) "potential entrepreneurs" are those who plan to start a new business in the next three years; ii) "nascent entrepreneurs" are those individuals involved in setting up a new business, and who have paid wages (to employers or to themselves) for less than three months; iii) "new entrepreneurs" are owner-managers of firms that have paid wages for a period of time between 3 and 42 months; iv) "established entrepreneurs" are owner-managers of firms that have paid wages for a period longer than 42 months.

The most important indicator produced by GEM is Total Early-Stage Entrepreneurial Activity (TEA). TEA measures the proportion of the working-age adult population actively engaged in starting or running a new business. Specifically, TEA is the sum of "nascent entrepreneurs" and "new entrepreneurs". In other words, TEA reflects the level of entrepreneurial dynamism in a country and represents an overall entrepreneurship rate. Another important indicator is the level of Established Business Ownership (EBO), or the percentage of adults owning and managing an established business, defined earlier 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. 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.

Figure 2.2: Entrepreneurial phases and GEM entrepreneurship indicators



Source: Bosma et al., 2020.

GEM collects information on individuals' entrepreneurial attitudes, activities and aspirations over all the phases of the entrepreneurship process. The focus on individuals differentiates GEM from other statistical sources, in particular from official statistics such as business registers and business surveys. Official records are collected at the firm-level and, as such, they neither measure entrepreneurship *per se* (although they are linked to it) nor capture attitudes and perceptions of entrepreneurs and potential entrepreneurs. Another limitation of official firm-level data is that they are not fully comparable across countries, because of the differences in countries' laws and institutions (e.g. mandatory incorporation with different turnover thresholds). Moreover, business registers do not record informal business activities and informal investment which might be relevant to assess entrepreneurship rates across countries (Marchese, 2015).

2.2 GEM surveys

The conceptual features of the GEM framework are reflected in the two surveys that are administered annually.

2.2.1 Adult population survey (APS)

The APS is a survey addressed in each country to the population that is between 18 and 65 years old. Each of the participating countries conducts the survey by interviewing a representative sample of at least 2,000 individuals (2,023 individuals in 2022). The field work takes place during the spring/summer of each year. The basic questionnaire is common to all countries participating in the consortium. The questionnaire comprises core questions and modules on special topics, the latter varying in principle every year. The core questions of the APS enquire about individual attitudes and perceptions on whether it is easy to start a business, whether there are good business opportunities, and whether fear of failure is an obstacle. Additional questions focus on whether that person is actively starting a new business or running an established business and what their motivations and ambitions are. Hence, the APS provides a comprehensive depiction of all phases of the entrepreneurial process.

The special modules of the APS have been focusing on topics such as immigrant entrepreneurs in 2012 (Xavier et al., 2013), subjective well-being in 2013 (Amorós and Bosma, 2013), family entrepreneurship, etc. Because of the relevance of immigration and well-being to Luxembourg, these modules have been retained in the national questionnaire ever since. In 2018, additional Luxembourg specific questions have been included in the questionnaire. They concern barriers and

enablers, entrepreneurial policies, and entrepreneurs' perception on such issues. A special module was administered to monitor entrepreneurial dynamics during COVID in 2020, 2021 and 2022. The 2022 module comprises the following eleven blocks of questions:

1. Nascent entrepreneurs;
2. Owner-managers;
3. Potential and discontinuing entrepreneurs;
4. Informal investors;
5. Employment and entrepreneurial employee activity;
6. Coronavirus pandemic (Special topic 2020-2022);
7. Entrepreneurship programs (Luxembourg specific questions);
8. Barriers and enablers (Luxembourg specific questions);
9. Individual perceptions: health; trust; well-being; job satisfaction (Luxembourg specific questions);
10. Immigration (Luxembourg specific questions);
11. Demographics of respondents.

To ensure consistency, the international GEM data team supervises the data collection process. During the field work, raw data are sent regularly to the GEM data team for quality checks. The observations are weighted to ensure that the joint distribution of the gender, age, education and immigration status of the respondents is equal to the distribution of the reference population as recorded in official registers.

Once collected at the country level, national records are harmonized to enable meaningful international comparisons of results. Indeed, a prominent goal of GEM is to collect comparable data to explore cross-country differences in the motivations of entrepreneurs, and to link these differences to job creation rates and economic growth.

2.2.2 National experts survey (NES)

The national experts' survey (NES) provides insights into the entrepreneurial start-up environment in each country. National experts provide information regarding nine Entrepreneurial Framework Conditions that influence entrepreneurial activities. They range from the ease of access to finance to social support for entrepreneurship, and from the adequacy of entrepreneurial education to the availability and cost of essential business services. Each of these aspects is evaluated in the NES by a group of four or more national experts, summing up to a total of at least 36 experts per country.

2.2.3 GEM surveys and the pandemic

Since 2020, the APS has been extended to include questions on COVID-19, specifically the effects of the pandemic on the ease (or difficulty) of starting a business, on growth expectations, and about the adequacy of government responses to the pandemic's economic impact. Additionally, NES national experts have been asked since to evaluate the response of both governments and entrepreneurs to the challenges brought about by the pandemic. The goal is to gauge, with some timeliness, the impact of the pandemic on entrepreneurial activities. What is more, the availability of comparable key GEM indicators on entrepreneurial activity over time provides reference points to aid this analysis.

In December 2020, GEM Luxembourg released the first report on how entrepreneurial activities in the country have been affected by the pandemic (Peroni et al., 2020). This analysis was extended in the 2021 report to include cross-country comparisons, exploiting Global GEM data on participating European countries (Peroni et al., 2021). Those previous reports documented the impact of the severe economic shock on entrepreneurship. Luxembourg saw a contraction of TEA activities and entrepreneurial intentions, accompanied by pessimistic views on business opportunities and the growth prospects of businesses. This was a generalised decline. At the same time, Luxembourg's entrepreneurs envisioned new opportunities, the share of opportunity-driven entrepreneurs remained stable, and the number of business closures was stable.

The current report exploits the entire Luxembourg GEM dataset, since its inception to the latest available observations collected in 2022, including the COVID special modules, and cross-country data from the global consortium. (The report uses APS data for Luxembourg and 13 European countries, namely Croatia, Cyprus, Germany, Greece, the Netherlands, Norway, Poland, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom.)[1] Before moving on to present the results, it is important to consider the following caveat when interpreting the data. Throughout the period of analysis, key variables display changes. Some of these variations might reflect structural changes affecting entrepreneurship, others might be the consequences of the pandemic, or other economic shocks, or the effect of randomness, due to sampling across a large population. Whenever possible, appropriate statistical techniques are employed to assess the significance of changes.

[1] Additionally, NES includes Italy and Latvia, whereas APS data are not available for these two countries.

3 10 years of entrepreneurship in Luxembourg

This chapter describes the evolution of entrepreneurship in Luxembourg over time, using data from the 2013 – 2022 waves of the GEM Adult Population Survey (APS). Additionally, data from the APS 2020-2022 special modules on COVID-19 provide insights on the effects of the pandemic on entrepreneurship. Section 3.1 presents the evolution of GEM's key indicators of entrepreneurial intensity. Section 3.2 reports on perceptions of business opportunities, and use the COVID special module to examine how entrepreneurs perceived (changes in) overall business conditions during the pandemic. The following sections focus on early stage entrepreneurship (TEA), one of GEM's key indicators. Section 3.3 studies how GEM indicators vary according to certain population characteristics (e.g. gender, education), and gauges whether the current crises has affected some groups more than others. Next, Section 3.4 describes changes in entrepreneurial motivations. Section 3.5 and Section 3.6 present data from a module of questions specific to Luxembourg on, respectively, perceived barriers to entrepreneurship, and on how entrepreneurs view Luxembourg's policy response to the pandemic. Finally, section 3.7 presents data sourced from the Luxembourg's business register and STATEC's business demography. These data provide additional insights on Luxembourg business dynamism.

Data show a persistent slowdown in early stage entrepreneurial activity (TEA) in the years since 2019 - years characterised by the outbreak of the COVID pandemic and growing economic uncertainties. In contrast, entrepreneurial intentions, and the number of established entrepreneurs rebounded to pre-pandemic levels, while the share of individuals trying to start a business is recovering. Also, the slowdown in early entrepreneurship is found across socio-demographic groups, but seems somewhat more pronounced in groups that have sustained the entrepreneurial dynamics in the past, namely foreign nationals and individuals with higher education levels. Another characteristics of Luxembourg's entrepreneurship, the gender gap, persists. The general perception is one of a more challenging business environment. Significantly fewer people than in the years before the pandemic declare that there are good opportunities to start a business. Entrepreneurs also think that starting a business is becoming more difficult and growth prospects are deteriorating. At the same time, they perceive the emergence of new opportunities. Overall, the individual features, attitudes an traits of entrepreneurs in Luxembourg have remained

stable over time. As expected, necessity-driven entrepreneurs have increased, while opportunity-driven entrepreneurs have decreased slightly during the pandemic. Luxembourg's specific module shows that entrepreneurs in the country are satisfied with the government aides and measures put in place to support businesses during the pandemic. What is more, entrepreneurs report a decline in obstacles to their activities, so that there is a general improvement in the Luxembourg-specific ecosystem.

3.1 Entrepreneurship over time

This section describes how entrepreneurship in Luxembourg has changed over time in the last ten years, focusing on key indicators of entrepreneurship. We use the GEM framework to guide this analysis. The framework highlights that entrepreneurship is a *process* (e.g. Van der Zwan et al., 2010), whereby entrepreneurs move through the following stages (see Chapter 2 for more details):

1. Potential entrepreneur: expecting to start a new business within the next three years;
2. Nascent entrepreneur: involved in setting up a business;
3. New entrepreneur: owner-manager of a firm younger than 42 months that has paid wages during the last three months;
4. Established entrepreneur: owner-manager of a firm that has paid wages for over 42 months.
5. Discontinued entrepreneur: owner-manager who has exited a business in the past 12 months.

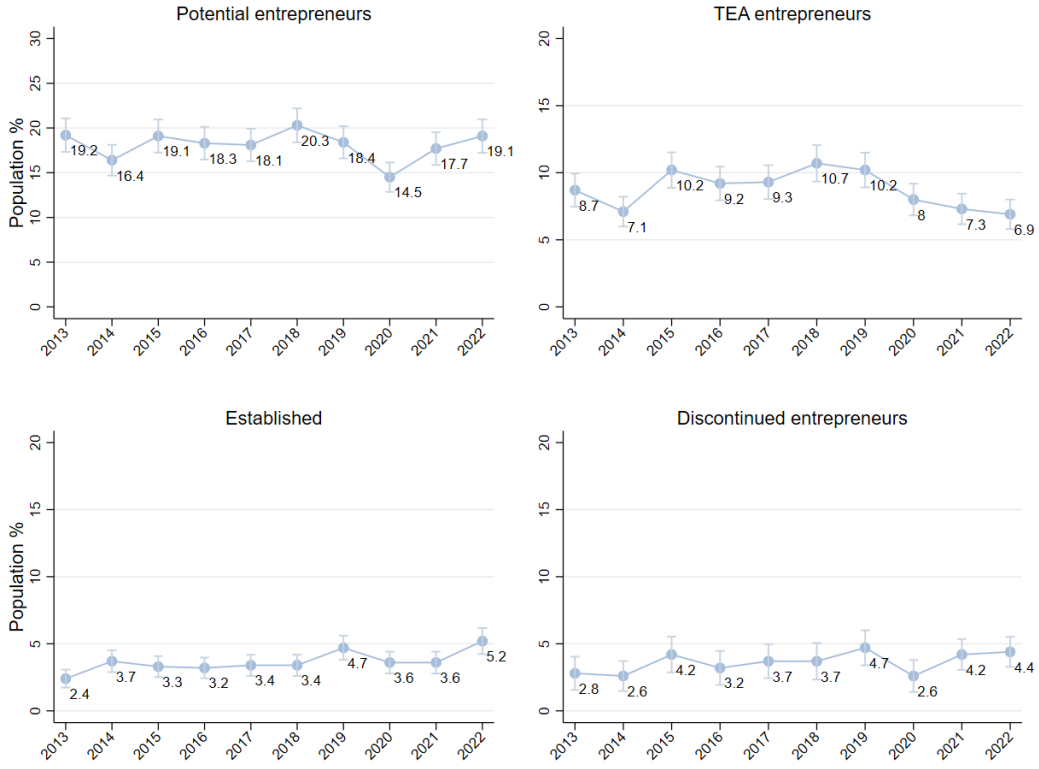
As in an obstacle race, every entrepreneur moves through the stages: at each stage, they can either leave, or continue to the next one in their entrepreneurial "journey".

Figure 3.1 presents the indicators of entrepreneurship in Luxembourg from 2013 to 2022. One can see the shares of **potential entrepreneurs** (top left panel), **TEA (Total Early-stage entrepreneurial Activity)** (top right), **established entrepreneurs** (bottom left) and **discontinued businesses** (bottom right). TEA, a key indicator of the intensity of entrepreneurship, combines information on nascent and new entrepreneurs (that is, stages 2 and 3 of the entrepreneurship process). All indicators are calculated as percentage shares of the total population. The data suggest that the pandemic had an adverse effect on entrepreneurship. One can see that the TEA rate has been experiencing a downward trajectory since 2020, the year of the pandemic outbreak. Both shares of potential and established entrepreneurs decreased on impact, while the share of discontinued business has increased after an initial slowdown, possibly due to government interventions and/or lag effects.

Nevertheless, data for 2022 show signs of recovery in entrepreneurial activity. The shares of potential entrepreneurs and established entrepreneurs have increased in the last two years, with both indicators re-aligning to pre-pandemic levels.

Recent years have been characterised by economic shocks, from the COVID-19 pandemic, to emerging geopolitical tensions, rising energy prices and inflation, and the worsening of credit conditions. Economic shocks represent a threat to

Figure 3.1: Key Indicators of entrepreneurship (2013 – 2022).



Source: 2013 – 2022 GEM Luxembourg APS data.

entrepreneurs and existing ventures, but also raise concerns about entrepreneurial endeavours that would have emerged in the absence of those shocks. This so-called "missing generations of firms" can adversely impact future entrepreneurship and, thus, aggregate economic performance (Sedlacek and Sterk, 2020; Benedetti Fasil et al., 2020; OECD, 2020).

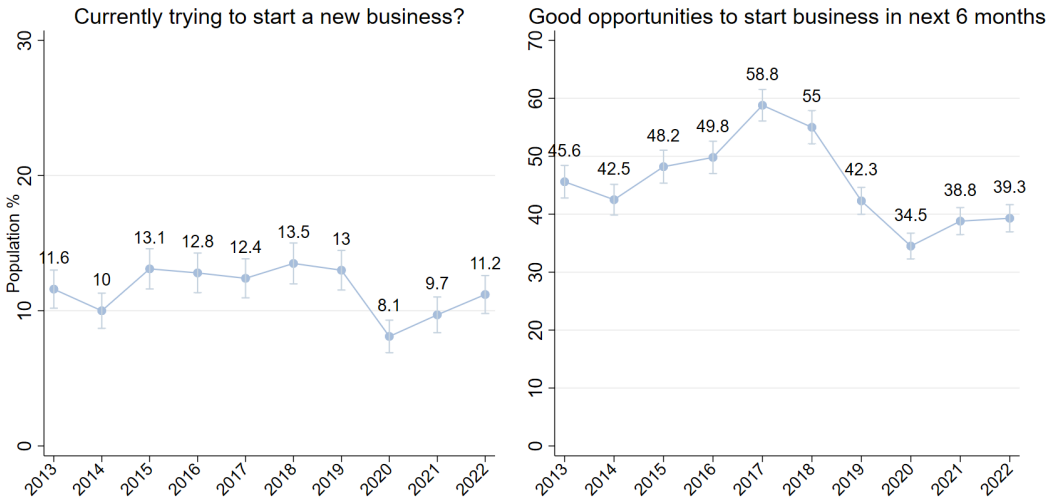
Insights on this aspect can be drawn from the indicators capturing the **emergence of new entrepreneurs**, such as the share of individuals who intend to start a business (i.e. the GEM's potential entrepreneurs), and those that are currently trying to start a business.

The previous section showed that entrepreneurial intentions suffered from the pandemic's impact, but have subsequently recovered (figure 3.1, top left panel). The share of individuals that are **currently trying to start a business** has also decreased on impact. It is recovering, albeit it has not reached pre-pandemic levels. This can be seen in Figure 3.2 (left panel): this indicator, stable until 2019, shows a significant decline afterwords, from 13% in 2019 to 8.1% in 2020, followed by a rebound to 11.2% in 2022.[1]

[1] The share of individuals currently trying to start a business is linked to the share of "nascent entrepreneurs", a component of TEA. Nascent entrepreneurs are those that are currently trying to

As TEA is composed by those individuals that are either starting (nascent entrepreneurs) or running a new business, data suggests that the persistent decline in TEA observed in Luxembourg could be driven, at least partly, by the fall in the share of individuals trying to set up new business, reflecting the drop in nascent entrepreneurship detected in previous years.

Figure 3.2: Trying to set up a business and opportunities to start a business (2013-2022) .



Source: 2013 – 2022 GEM Luxembourg APS data.

setting up a new business, and have paid wages (to employers or themselves) for less than three months.

3.2 Perceptions of the business environment

"Sentiments" and expectations are important in economics. Among factors contributing to entrepreneurial activities, an overall perception of favourable business conditions can play a significant role in fostering entrepreneurship endeavours. Thus, the emergence of new entrepreneurs and start-ups is also related to perceptions of business opportunities. This "sentiment" can provide valuable information for assessing the evolution of early entrepreneurship and the impact of the pandemic.

Figure 3.2 (right panel) documents that, after a positive trend that lasted several years, the share of respondents declaring to perceive **good opportunities to start a business** has dramatically declined in recent years. In 2017, approximately 58.3% of individuals perceived good opportunities to start a business in Luxembourg. This figure had declined to 34.5% in 2020. Data show an improvement in 2021 and 2022, although perceptions of business conditions seem overall less favourable compared to the pre-pandemic levels.

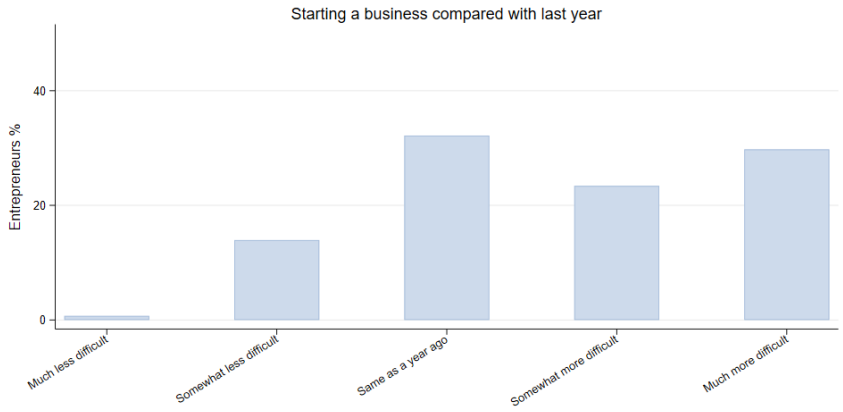
How do (new and established) entrepreneurs perceive their business environment during COVID?[2] Economic shocks, plausibly, make starting a business more difficult. They can also affect the growth of newly established businesses. Indeed, prior research has found that economic downturns generally hamper the growth of young and small firms (Fort et al., 2013; Bartz and Winkler, 2016).

In 2022, about 53% of entrepreneurs reported that setting up a business was more challenging compared to the previous year (see Figure 3.3). This contrasts with the 43% and 64% reported in, respectively, the 2021 and 2020 survey waves. This plausibly reflects the impact of the pandemic outbreak (2020) and the increasing economic uncertainty related to inflationary and geopolitical tensions (2022).

On **business growth expectations**, approximately 41% of respondents expected their businesses to grow less compared to 2021. Around 24% reported no substantial change, while 35% had higher growth expectations (see Figure 3.4). This suggests some improvement compared to the data collected in 2021, when 40% of respondents expected lower growth, 30% no significant change, and 30% higher growth Peroni et al., 2020. What is more, figure 3.4 shows that, in 2022, approximately 54% of entrepreneurs agreed that the COVID-19 pandemic had provided them with **new business opportunities** to pursue. This supports the notion that economic shocks represent both a challenge and an opportunity.

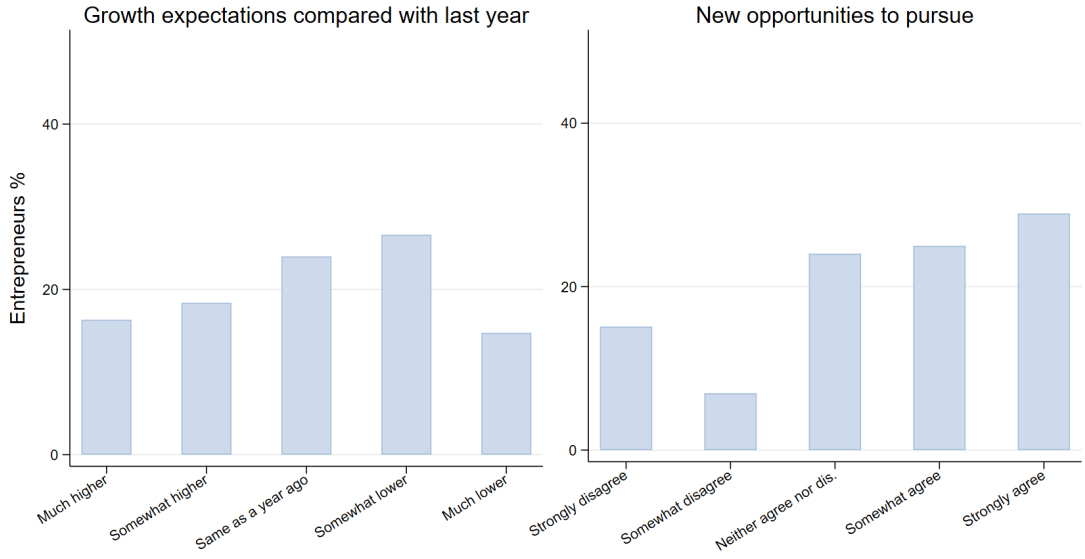
[2] The questions in the reminder of this section are administered to a subsample of individuals that declare to be running a new or established business.

Figure 3.3: Difficulty of starting a business.



Source: 2022 GEM Luxembourg APS data.

Figure 3.4: Change in growth expectations and new opportunities to pursue.



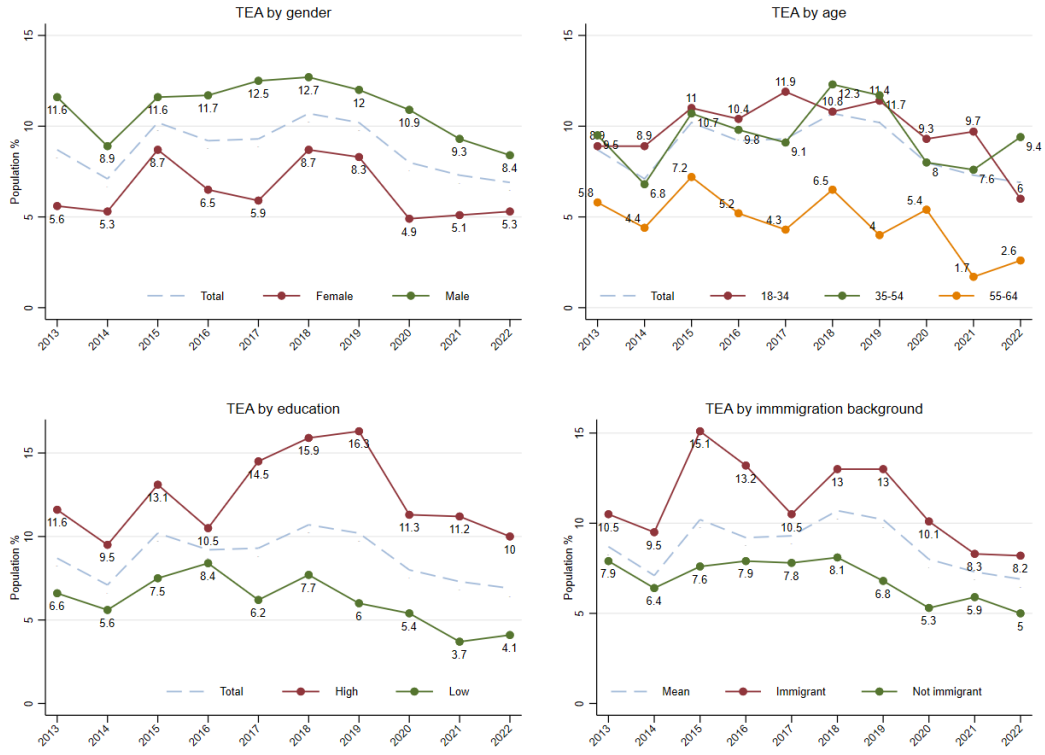
Source: 2022 GEM Luxembourg APS data.

3.3 Characteristics of Luxembourg's entrepreneurs

Aggregate GEM data show that early entrepreneurship has been declining in Luxembourg since 2018. What follows presents the evolution of TEA according to several individual characteristics of entrepreneurs (i.e. socio-demographic factors). This allows us to study how entrepreneurial endeavours vary across population groups. It also allows us to check whether the decline experienced during the pandemic is especially severe for certain groups. Data reveals the persistent **gender gap** in Luxembourg, and the marked slowdown in two important categories of early entrepreneurs: those with higher education and with an immigration background.

Figure 3.5 shows the evolution of TEA by gender (top left panel), age (top right), education (bottom left), income and immigration background, and compares it to the aggregate TEA (dashed line).

Figure 3.5: TEA: gender, age, education and income level (2013 – 2022).



Source: 2013 – 2022 GEM Luxembourg APS data. Notes: high education is defined as obtaining at least a tertiary education degree; immigrants are those residents who were not born in Luxembourg.

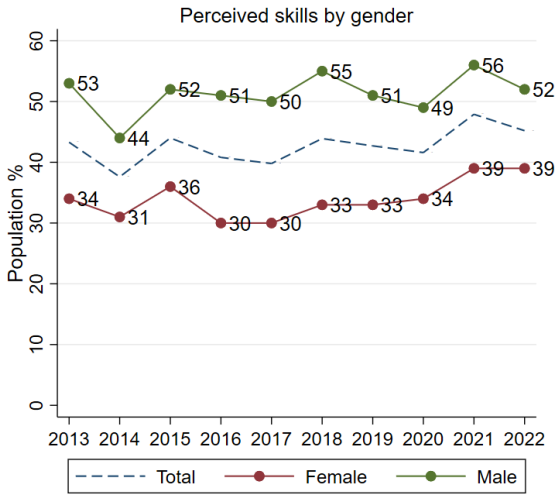
The descriptive evidence shows the existence of a statistically significant entrepreneurship gender gap in Luxembourg. Over the period, male respondents have consistently reported a higher TEA than female respondents over the period. Trends have been similar, with two exceptions. Firstly, women TEA has decreased in 2016 and

2017. Secondly, during the pandemic TEA has been decreasing in both groups, but with different patterns. As a result, in 2022 the gender gap narrowed slightly, as the percentage of women engaged in TEA increased from 5.1% to 5.3%, while the percentage of men decreased from 9.3% to 8.4%.

There are various factors that can account for the observed gap, including cultural norms. One possible explanation of the gender gap is "self-efficacy", which refers to an individual's belief in their ability to perform the necessary behaviors (Wilson et al., 2007). Figure 3.6 illustrates that women consistently perceive themselves as having fewer entrepreneurial skills than men, which provides support to the self-efficacy view. In 2022, 39% of women reported having the knowledge, skills, and experience required to start a new business, compared to 52.5% of men.

The entrepreneurship gender gap has been observed in all GEM countries (Elam et al., 2021). It has also been found in studies that use alternative indicators of entrepreneurship, such as self-employment and sole-proprietorship (Halabisky, 2018; OECD and European Union, 2018). Reports by the OECD (OECD and European Commission, 2021) document that in Luxembourg there are more self-employed men than women.

Figure 3.6: Perceived entrepreneurial skills among women and men (2013 – 2022).



Source: 2013 – 2022 GEM Luxembourg APS data.

TEA also differs across age groups. Typically, TEA tends to be higher among younger individuals. This can be seen throughout the period. In 2022, the gap between the group 18-34 and 55-64 slightly narrowed, due to a decrease in early entrepreneurship for the youngest group (6%, down from 9.7 recorded in 2021), while older individuals showed a slight increase (from 1.7 to 2.6%). The TEA rate for the 35-54 years old increased to 9.4%, which followed a period of decrease during the pandemic.

The lower left panel in Figure 3.5 depicts TEA for individuals that have been grouped according to their education level.[3] Over the period, TEA has been always higher among individuals with higher level of education. This is consistent with previous findings of a positive effect of education on the decision to start a business (Block et al., 2013). After 2019, we observe a decrease in TEA for both groups of individuals. TEA has been declining more markedly in the highly educated group, decreasing from its peak of 16.3% in 2019 to a 10% in 2022. There is a slight increase in TEA for individuals with lower education levels.

The lower right panel in Figure 3.5 shows that immigrants' TEA is higher than the natives' throughout the period. The last data point, 2022, recorded a TEA rate for immigrants of 8.2%, compared to 5% for natives. This trend highlights the contribution of immigrants to the entrepreneurial landscape in Luxembourg. Diverse backgrounds, motivation, and a greater entrepreneurial willingness, particularly among highly educated immigrants, plausibly contribute to this pattern. Noticeably, previous studies highlighted immigrants' higher propensity for entrepreneurship, but also the lower success rates that immigrants exhibit in the subsequent stages of entrepreneurship Peroni et al., 2016. One also observes a steeper decline in TEA among immigrants, which fell from 13% in 2019 to 8.2% in 2022. In contrast, and albeit lower, the TEA rate among natives has remained relatively stable, decreasing from 6.3% to 5% during the same period.

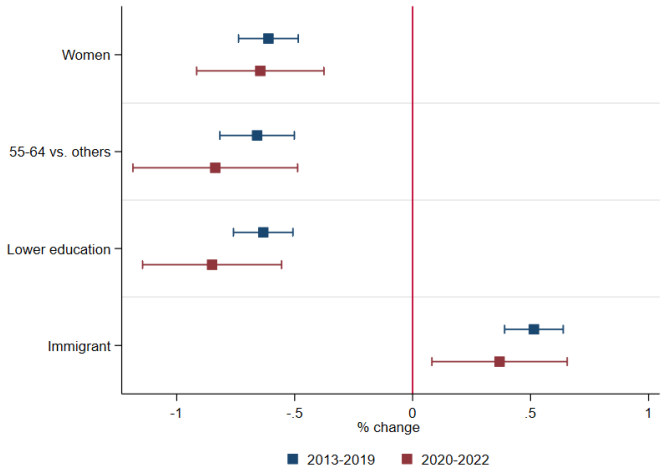
[3] High education refers to those individuals who have obtained at least a tertiary degree, that is, a bachelor degree or higher.

The determinants of entrepreneurship

Are the differences in TEA across groups, identified in the descriptive analysis of this chapter, a robust feature of the data? The analysis presented in this exhibit tests the statistical significance of the TEA differences across groups using regression analysis. Specifically, we estimate a regression model that allows us to check whether the TEA gender gap, immigration status, education and age effects still hold when accounting for the effect of the other characteristics.

Figure 3.7 shows that gender, immigration status, age and education are strong and significant predictors of being a TEA entrepreneur. This holds for both periods considered, that is, 2013 – 2019, and 2020 – 2022.

Figure 3.7: Drivers of TEA entrepreneurship (2013 – 2022).



Source: GEM Luxembourg APS data 2013 —2022. Legend: Results are from the estimation of a logit regression model with robust standard errors. The squares indicate point estimates and bars 90% confidence intervals. Points estimates are interpreted as follows. A coefficient of minus 50 percent associated to women indicates that women are 50 percent less likely to engage in TEA than men. The number of observations is 13 362. The model has been estimated separately for two periods, namely 2013 – 2019 (confidence intervals and point estimates in blue), and the pandemic years (2020 – 2022, red) which yields similar results. Confidence intervals are larger in the second period due to fewer observations.

3.4 Entrepreneurial motivations

GEM data allows us to explore entrepreneurial motivations, specifically to differentiate between opportunity-driven and necessity-driven entrepreneurship, to capture qualitative aspects of entrepreneurship. **Opportunity-driven entrepreneurs** are those individuals engaging in entrepreneurial activities because they see a profitable business opportunity. Necessity-driven entrepreneurs are individuals who establish new ventures due to a lack of paid employment opportunities. These types of entrepreneurship typically behave differently along the business cycle (R. Thurik, 2014), with necessity entrepreneurship behaving anticyclical and opportunity entrepreneurship being procyclical. In other words, economic downturns are usually characterized by an increase in necessity-driven entrepreneurs (Fairlie and Fossen, 2019). Necessity-driven entrepreneurship is seen as less desirable than opportunity-driven entrepreneurship. This is because the literature shows that opportunity-driven entrepreneurs create firms that tend to have higher growth prospects and create more jobs than necessity-driven entrepreneurs (Fairlie and Fossen, 2019; Schoar, 2010).

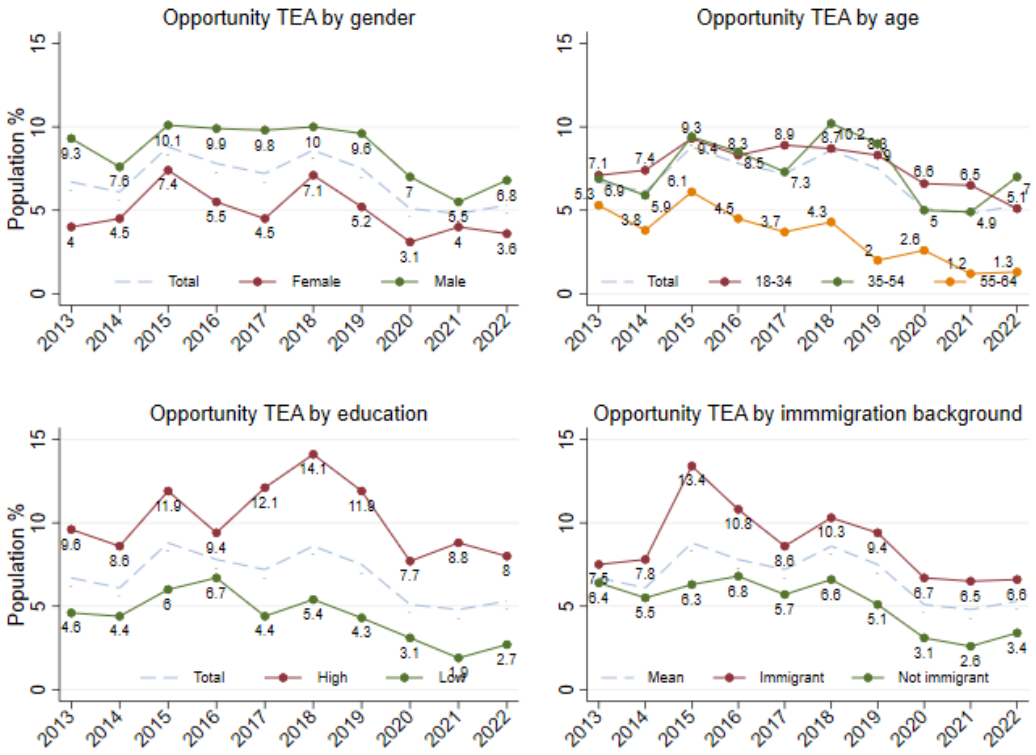
GEM captures opportunity-driven entrepreneurship by asking entrepreneurs whether they set up a firm because they wanted "to make a difference in the world". Necessity-driven entrepreneurs are those that declare they engage in entrepreneurship due to a lack of alternative job opportunities.

Figure 3.8 shows that opportunity-driven TEA followed a similar pattern than overall TEA over the 2013-2022 period. To gain a better understanding of the characteristics of opportunity-driven TEA entrepreneurs, we examine their profile across observable socio-demographic factors, taking the same approach as in Figure 3.5. Interestingly, the main patterns remain in terms of gender, age, education, and immigration background (see Figure 3.8). Opportunity TEA is lower among women and people aged 55-64, and higher among higher-educated individuals and immigrants. [4]

The current crisis confirms patterns observed in other countries during previous downturns (Bosma and Levie, 2010; Fairlie and Desai, 2021; Fairlie, 2013). Early evidence provides some support for the idea that the pandemic might have created new opportunities for entrepreneurs, for example in response to changing demand or customer preferences. Data for France, Netherlands and the US show that new businesses were mostly created in the wholesale and retail sector, with a large proportion being online retailers (Buffington et al., 2021; Fareed and Overvest, 2021). This is consistent with an ongoing push towards remote interactions between consumers

[4] Results from the econometric analysis for TEA opportunity-driven, not reported for reasons of space, confirm the robustness of these features.

Figure 3.8: Opportunity driven TEA entrepreneurs by gender, age, and education (2013 – 2022).

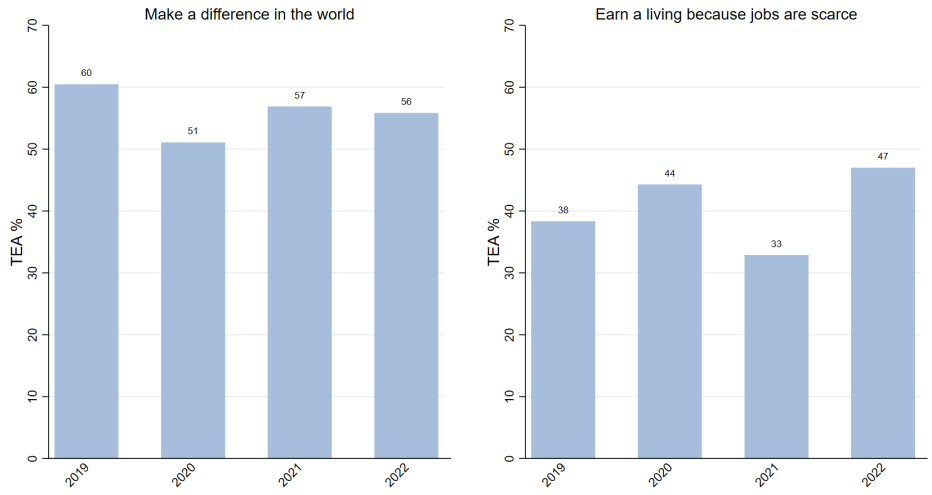


Source: 2013 – 2022 GEM Luxembourg APS data. Notes: there is a break in the data in 2019. In the period from 2013 to 2019, opportunity TEA is defined as the share of TEA entrepreneurs who are pulled towards entrepreneurship by business opportunities and driven by a desire for independence or to increase their income. Starting from 2019 onward, the definition of opportunity TEA includes TEA entrepreneurs who are motivated by a desire to make a difference in the world or to build great wealth or achieve a very high income. High education is defined as obtaining at least a tertiary education degree; immigrants are residents not born in Luxembourg.

and businesses, which the pandemic seems to have amplified. On the other hand, past recessions saw an increase in business creation attributable to entrepreneurship by necessity (Fairlie, 2013). Limited opportunities in paid employment may trigger a surge in necessity entrepreneurship. Data for the US, for example, show that, during 2020, there was an increase in necessity-driven entrepreneurship and a decrease in opportunity-driven entrepreneurship (Fairlie and Desai, 2021).

Figure 3.9 compares shares of necessity- and opportunity-driven entrepreneurs for 2022 and 2019 in Luxembourg. (The respondents are TEA entrepreneurs.) In 2022, the share of early stage opportunity-driven entrepreneurs had dropped by 4 points, compared to 2019. Conversely, the rate of early-stage entrepreneurs due to a lack of job opportunities had risen from 38% in 2019 to 47%. These results suggest that the pandemic has prompted changes in the quality, as well as in the intensity, of entrepreneurship.

Figure 3.9: Entrepreneurial motivations (2019 – 2022).



Source: 2019 – 2022 GEM Luxembourg APS data.

3.5 Barriers to entrepreneurship

Since 2016, seven dedicated questions ask APS respondents to assess **barriers and enablers** of **Luxembourg's entrepreneurial ecosystem**. Respondents are asked to measure their agreement with the following statements:[5]

- I can easily access funding for launching and running my company.
- I have time to launch a new company.
- I can easily access needed information to start my company.
- Dedicated training programs to start a new company are available and adequate
- I can easily access potential customers.
- I can easily access office spaces that are affordable.
- Qualified and affordable human resources, needed for launching and running a new company, are available.

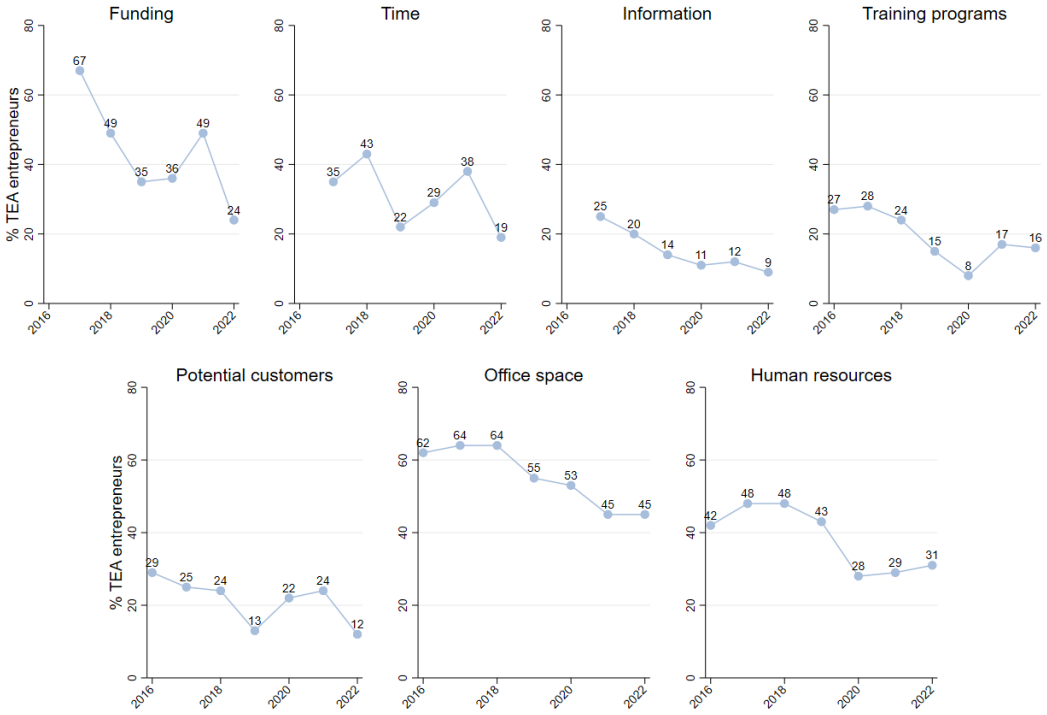
This information is valuable because it contributes to understanding what hampers, or favours, entrepreneurial activity in Luxembourg. Furthermore, given the context, it is interesting to examine whether APS respondents have changed their view on barriers/enablers over time.

Figure 3.10 illustrates the evolution of perceived barriers to entrepreneurship during 2016-2022, according to TEA entrepreneurs. (The shares refer to those entrepreneurs that strongly disagree or disagree with the corresponding statements, so that higher percentages represents a more negative evaluation of the specific factor.) The first noticeable aspect is that all barriers, with possibly one exception, feature a downward trend, indicating that entrepreneurs have been viewing these factors as less problematic over time. Among the obstacles whose relative importance has been decreasing over time, we find: access to funding, access to information, time, availability of training programs, all exhibiting a steep decline. Over the period, the primary concern for entrepreneurs is office space, with around 45% of entrepreneurs at least somewhat disagree to having easy access to affordable office spaces (2022), followed by the availability of human resources.

The decline in perceived obstacles to entrepreneurship has persisted in 2022 across various variables. This indicates that, so far, the COVID-19 pandemic has not led to significant changes in the barriers as perceived by entrepreneurs in their business activities. For example the difficulties to find adequate office space declined during the pandemic, plausibly due to the diffusion of working from home practices.

[5] Answers ranges on a scale from 1 (i.e. completely agree) to 5 (i.e. completely disagree).

Figure 3.10: Barriers according to entrepreneurs (2016 – 2022).



Source: 2016 – 2022 GEM Luxembourg APS data. Notes: proportion of TEA entrepreneurs that strongly disagree or disagree to the statement: I can easily access..

Respondents report an improvement in access to funding in 2022. While this might seem surprising, the survey was conducted in the early summer of 2022, when financial conditions remained largely favourable. (Credit conditions have started deteriorating in the second half of the year, signalled by increases in the interest rates.) Future survey waves will allow us to better assess the evolution of the availability of funding for entrepreneurs.

The results show that entrepreneurs in Luxembourg are mainly concerned by the availability of office space and of adequate human resources.

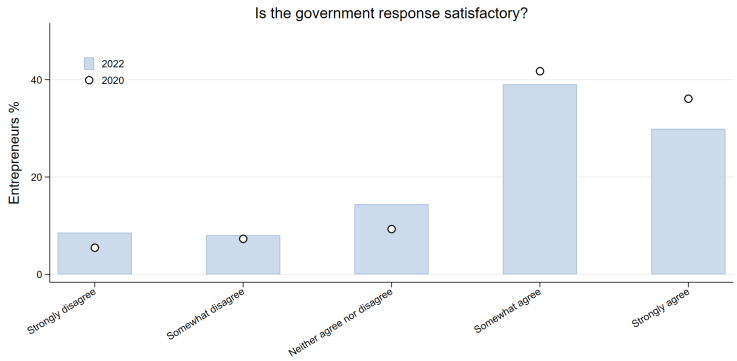
These findings are in line with those of the Access to Finance of Enterprises (SAFE) survey conducted by the European Central Bank in September/October 2022 (ECB, 2022). According to SAFE, entrepreneurs in Luxembourg reported that their primary concerns were the lack of skilled labour and the rise in input costs, with access to finance ranking among the least-reported concerns. Thus, entrepreneurs in Luxembourg continue to face specific challenges related to the offer of skilled labour and increasing input costs. One caveat is that these figures refer to resident

entrepreneurs only. Non-resident entrepreneurs might face greater difficulties and might have different views on barriers.[6]

3.6 Entrepreneurs and the government response to the pandemic

The government has taken steps to address the adverse effects of the COVID-19 pandemic and subsequent energy crises on the economy. Various measures have been implemented to support the private sector, aiming to assist businesses in overcoming financial challenges and avoiding insolvency. These measures particularly target younger and smaller firms, with a specific focus on providing extraordinary provisions to support innovative start-ups.[7] Furthermore, support measures have been implemented to assist companies in their energy transition efforts and the decarbonization of their activities. Initiatives such as Solidaritéits Pak and Solidaritéits Pak 2.0 have been introduced to facilitate this transition.[8]

Figure 3.11: Government response to the economic consequences of the pandemic.



Source: 2020 – 2022 GEM Luxembourg APS data.

Although we lack specific data on the perception of measures addressing the energy and inflation crisis by entrepreneurs, the Global Entrepreneurship Monitor (GEM) has inquired about the effectiveness of government responses to the economic consequences of the coronavirus outbreak. The data reveal a generally positive

[6] Cross-border entrepreneurs are not included in the GEM sample. However, the European Commission, based on IGSS data, documents that, in November 2022, approximately, 20% of the self-employed were cross-border workers (5966 over a total 29383) (EU Commision, 2023).

[7] In Luxembourg, a comprehensive list of the measures supporting innovative businesses during the pandemic can be found at https://meco.gouvernement.lu/en/dossiers/2020/coronoavirus-entreprises.html or https://www.startupluxembourg.com/support-measures-startups

[8] More information on Solidaritéits Pak is available at https://gouvernement.lu/dam-assets/documents/actualites/2022/03-mars/31-tripartite-accord/Accord-Tripartite-Solidariteitspak.pdf, and Solidaritéits Pak 2.0 at https://gouvernement.lu/dam-assets/documents/actualites/2022/09-septembre/28-tripartite/skm-c36822092814330.pdf

appreciation of government efforts in addressing the pandemic, with a slight decrease in satisfaction observed over time. In 2022, approximately 63% of respondents agreed that the government's response was satisfactory, compared to 79% in 2020 (Figure 3.11).

3.7 Business dynamism and entrepreneurship

The main purpose of GEM is to gather information on entrepreneurs and their environment, so the surveys are conducted on individuals. The information on the firms created by entrepreneurs is more limited. Entrepreneurship, however, is strictly related to business dynamism. (Business dynamism is a term that refers to the birth, growth, decline and closure of firms, and the associated impact on employment.)[9] Thus, this section presents evidence on aspects of Luxembourg's firm dynamics from additional data sources, namely the Luxembourg Business Register and STATEC's Business Demography. The goal is to complement GEM data with information based on firm-level data, and to provide further insights on the evolution of entrepreneurship in Luxembourg. The associated caveat is that the datasets considered are not directly comparable to GEM due to differences in the unit of observations and coverage.

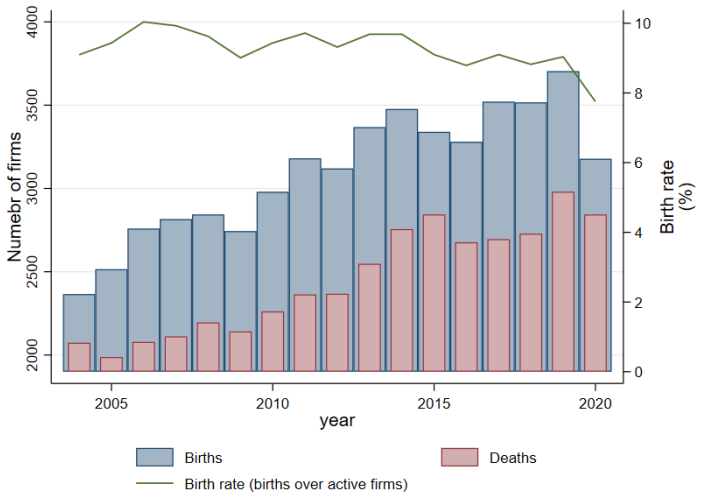
The Luxembourg Business Register (LBR) is an administrative source that provides information on the registrations of new businesses. Data are available at monthly frequency and are timely. The registrations of new businesses, however, can be influenced by various factors, including events such as mergers, takeovers, and internal restructuring, which can be not related to entrepreneurship. Moreover, appearances and disappearances of businesses in registers are not easily comparable across countries due to differences in legal and administrative requirements, including mandatory incorporation thresholds (OECD, 2011). Business demographies (BD) typically address these limitations, as they are comparable across countries and exclude non-entrepreneurial events (e.g., mergers or breakups) (STATEC, 2023a). They are compiled annually by STATEC adopting the methodological indications of the Eurostat-OECD Manual on Business Demography Statistics (Eurostat and OECD, 2007), and provide information on the number of active firms in the business economy, and aspects such as firms' entry, survival, and growth. Luxembourg's BD data are available from 2004 to 2020 (see STATEC, 2021, for more details). Despite offering greater accuracy in measuring genuine business creation, one limitation of BD data is that they are available with a considerable lag. What follows discusses evidence from Luxembourg's BD and business register.

[9] Typical indicators of business dynamism are rates of entry and exits of businesses, and related rates of job creation and destruction. One can see, for example, the business dynamism pages of the ONS, UK, or Eurostat.

3.7.1 Business demography

Business Demography data suggests a slowdown in business dynamism in Luxembourg in recent years. Figure 3.12 shows that both firms entry and exit increased over the period 2004-2020, and that the creation of new firms outnumbered closures. It also shows a slow-down in entry and exit, captured by a decrease in the birth rate of firms.[10] In 2020, the latest available year of BD data, the creation of new firms experienced a sizeable slowdown. As a consequence, firm birth rate, measured as the birth of new firms over existing firms, lowered to 7.8% in the same year, the lowest value on record.

Figure 3.12: Business demography in Luxembourg (2004 – 2020).



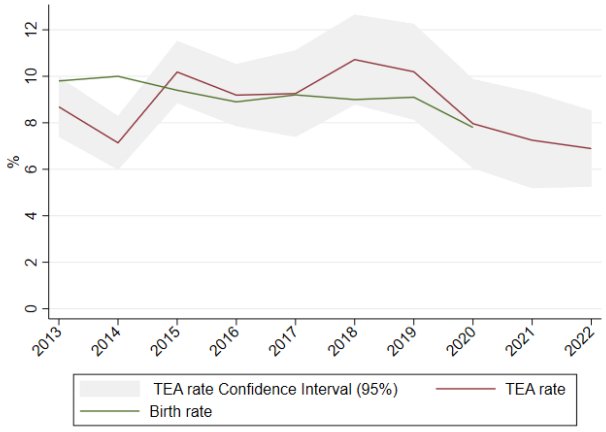
Source: STATEC business demography 2004 – 2020.

Figure 3.13 plots the firm birth rate (green line) and Total Early-stage Entrepreneurial Activity (TEA) rate (red line). The shaded area represents the confidence interval for TEA, that is, a range of values within which the true TEA rate is likely to fall in the population. (For instance, in the most recent available data for 2020, the TEA rate was 8% with confidence intervals ranging from 6% to 10%).[11] The data show a certain alignment of the two indicators, suggesting that the data provide consistent information. The series' trends are consistent, with the exception of 2014 and 2018. For the latest available year of BD, 2020, the decreasing birth rate is consistent with the observed decrease in TEA.

[10] The number of active firms increased during the period, reaching approximately 41,000 in 2020 (STATEC, 2023c).

[11] A confidence interval is a statistical tool to measure uncertainty when estimating population parameters using a sample instead of the entire population. Confidence intervals are crucial for understanding the reliability and precision of survey data, including the GEM survey.

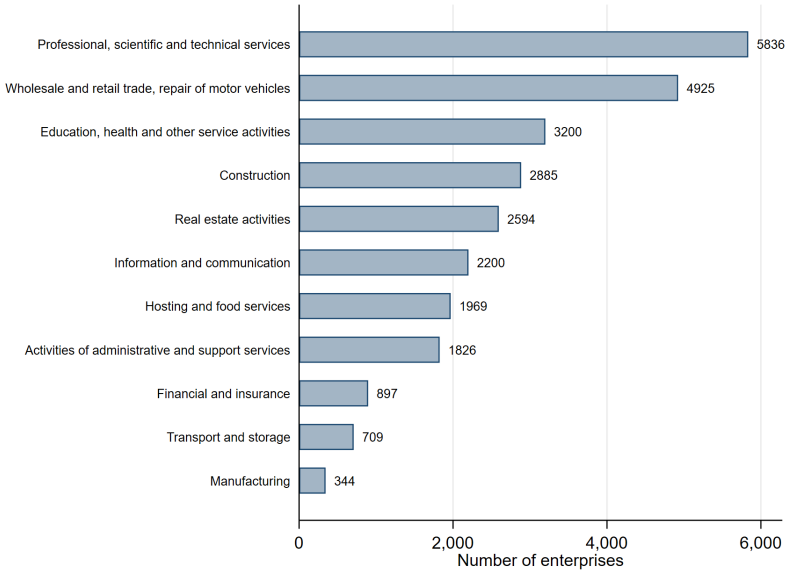
Figure 3.13: Birth rate and TEA in Luxembourg (2004 – 2020).



Source: STATEC business demography 2004 – 2020.

An advantage of BD data is that it provides information on the type and characteristics of newly created firms. Figure 3.14 presents the total number of newly created firms by industry, or group of economic activity over the period 2013–2020. One can see that the majority of new firms have been created in professional, scientific, and technical services. Manufacturing had the lowest number of newly created firms, but their size was on average higher than the size of new firms in other groups of economic activities.[12]

Figure 3.14: Firm creation by industry (2013 – 2020).

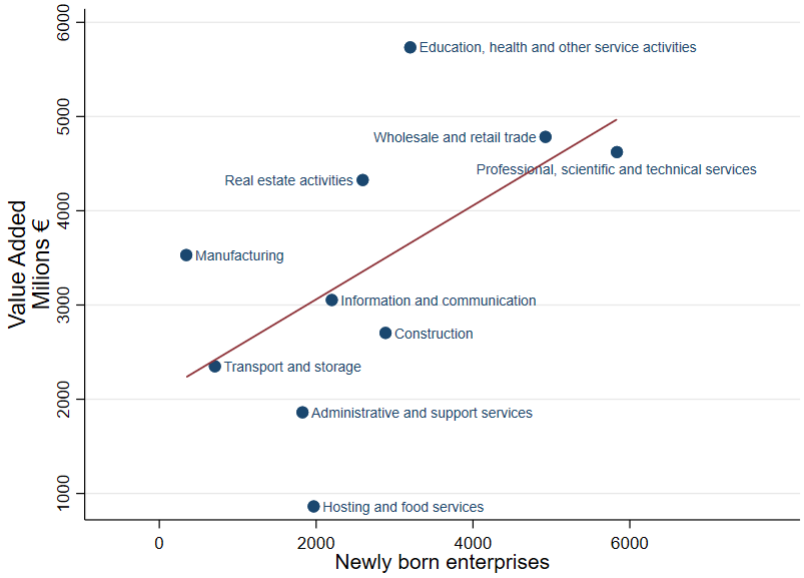


Source: STATEC business demography and national accounts. Total number of firms created, 2013–2020. Manufacturing also includes electricity, gas and water (NACE codes D and E).

[12] In 2019, the average workforce of new manufacturing firms was 42 employees (STATEC, 2021).

Figure 3.15 presents a scatterplot and the statistical association (red line) of firm creation versus value added for the various industries. Overall, firm creation tends to be higher in high-value-added industries. Professional, scientific, and technical services, education, health, and other services, which largely belong to the category of knowledge-based services (Eurostat, 2023), are characterized by both high value-added and a large number of new enterprise births. Typically, sustained firm creation in high value added industries, as well as in knowledge intensive industries, is desirable because these firms are effective in fostering innovation rates and productivity growth (e.g Audretsch and Fritsch, 1994; Hertog, 2000; OECD, 2023b).

Figure 3.15: Firm creation and value-added (2013 – 2020).



Source: STATEC business demography 2013 – 2020 and national accounts. Each point represents a pair of observations on value added - number of newly created firm in the corresponding industry. Value added figures are yearly averages. Figures for newly created firms are total over the period. Manufacturing includes electricity, gas and water (NACE codes D and E). Data for the financial industry is not available.

As previously mentioned, the Business Demography data in Luxembourg offers the most reliable information regarding business creation. However, this data is not available in a timely manner (at the time of writing, the latest available observation was for 2020.). To provide information on the most recent developments, the following section presents the latest data obtained from the business register.

3.7.2 Business registrations and bankruptcies

The GEM survey was conducted during the summer of 2022. To have a broader picture, and to assess the robustness of trends highlighted by GEM data, as well as the effect of the pandemic on business dynamism, we contrast information from GEM to data from the Business Register. BR data provide timely indicators of business dynamism, as observations on deletions and registrations are collected monthly and are made available with relative timeliness. What is more, new business creation rates have been found to positively correlate with GEM indicators capturing early-stage entrepreneurial activity (Marcotte, 2013), thus providing an additional indicator for monitoring new entrepreneurial activities. We first report on firm exit and then on business creation.

Firm exit is regarded as an important indicator of business dynamism and of the overall conditions of entrepreneurial ecosystems. Data on bankruptcies provide a timely indicator of firm exit. The Ministry of Justice, STATEC, and the LBR have initiated a project to regularly release bankruptcy statistics (Ministère de la Justice and STATEC, 2020).

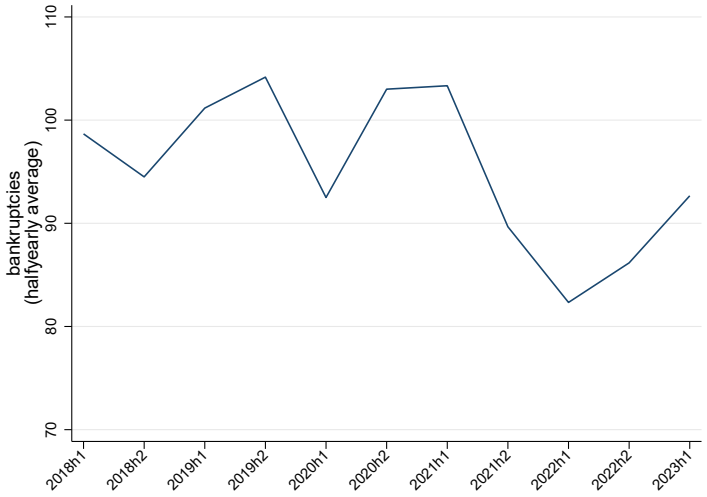
Figure 3.16 presents the time series evolution of bankruptcies in Luxembourg from 2018 to 2023. The series features wide variations. One can see that the number of bankruptcies decreased at the pandemic onset (first semester 2020), and decreased even more markedly between the second half of 2021 and first half of 2022. Bankruptcies show signs of an increase at the end of 2022 – beginning of 2023. Based on the latest available information at the time of writing (STATEC, 2023b), a total of 287 companies were declared bankrupt in the first quarter of 2023, reflecting a 5% rise compared to the same period in 2022. Regarding the industry breakdown, STATEC reports that the construction sector witnessed 58 bankruptcies, followed by trade with 55 bankruptcies, and Horesca (hotels, restaurants, and catering) with 38 bankruptcies.

The bankruptcy rate (that is, the number of exit over the total population of active firms), compiled by STATEC, stood at 1.9% for the year 2022.

These figures are consistent with the GEM discontinuation rate of 4.4% for the year 2022, which includes bankruptcies as well as selling and voluntary closures. (This was shown in Figure 3.1.)

Figure 3.17 reports the average number of business registrations from the LBR. After a slight decrease in the first half of 2020, Luxembourg's registrations of new businesses show a remarkable increase and a peak in the second half of 2021 (on

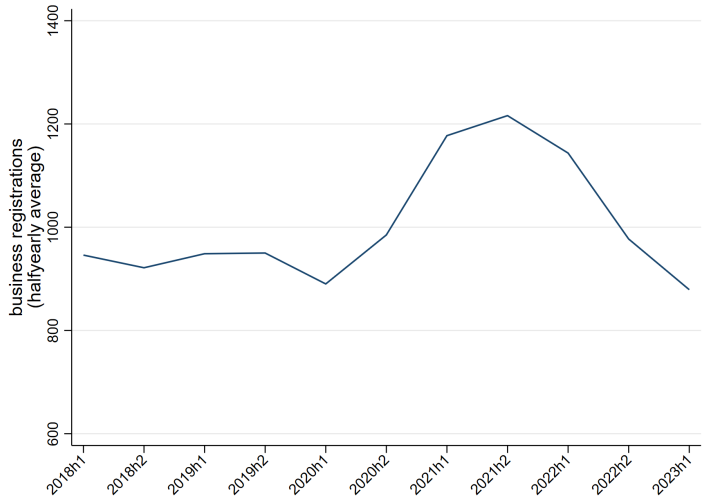
Figure 3.16: Monthly bankruptcies (2018 – 2023).



Source: STATEC, LBR, and the Statistical Service of the Ministry of Justice (STATEC, 2023b).The "h" in the horizontal labels denotes semesters. Figures are half-year averages on monthly observations.

average 1200 registration each month). Currently, data indicate a slowdown in registration to pre-pandemic level (950 registrations).

Figure 3.17: Monthly business registrations (2018 – 2023).



Source: Luxembourg Business Register. The "h" in the horizontal labels denotes semesters. Figures are half-year averages on monthly observations.

3.7.3 Business registrations across countries

In 2020, the OECD collected business register data for selected countries and observed that the initial coronavirus outbreak and subsequent lockdowns hampered the start of new businesses during the first semester of 2020 across many countries. The same data for 2021 showed that the firm entry had broadly recovered from the COVID-19 shock, albeit at an uneven pace (OECD, 2021b). This seems to be consistent with what was observed for Luxembourg. As Luxembourg was not included in the OECD publications, we have re-elaborated the LBR data presented in Figure 3.17 to compare the country's firm entry with entry in selected OECD countries. (We use the latest available observations, that is, the year 2022 for the OECD countries and years 2022 and first half 2023 for Luxembourg.) Specifically, we compare monthly data for 2022 and 2023 to the 2019 benchmark, and provide cumulative business creation figures. (Note that data points in Figure 3.17 are half-year averages.)

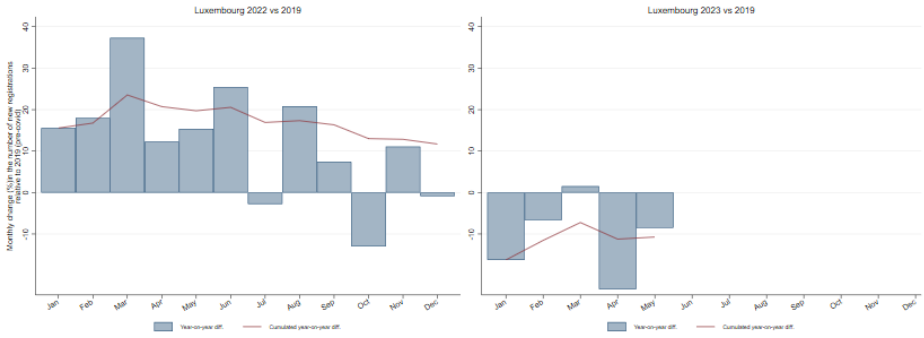
Figure 3.18 presents the year-on-year percentage changes in monthly registrations of new business, and an indicator of changes in cumulative registrations compiled from the LBR. The data show that the country's monthly business registrations during 2022 (barplot) were higher than in 2019, with the exceptions of three months, namely July, October, and December. (This is consistent with the slowdown detected in the second half of 2022 in the half-yearly data.) One can also see a positive trend in the number of registrations (continuous red line) up to March 2023, followed by a decrease afterwards, which signals a slow-down in business dynamics. The situation is reversed, however, at the beginning of 2023, where data signal fewer creations compared to those of 2019.[13]

How does this compare to other countries? (Here, the comparison refers only to the year 2022, the latest available observation for the OECD countries.) Based on the OECD data (OECD, 2023a), Figure 3.19 reports the year-on-year percentage differences in monthly business registrations between 2019 and 2022 for selected countries. Overall, there are signs of recovery but cross-countries variations are considerable. The evolution of business creation in Luxembourg is comparable to France, while Germany has a similar trend but lower creations. Conversely, while Sweden and the Netherlands recovered, Italy continued to suffer very strong contractions in business entry in 2022. Spain and Germany show large fluctuations

[13] The following example illustrates how figures presented in chart 3.18 have been compiled. Suppose that 1000 registrations are observed in January and February 2019, for a cumulated total of 2000. In contrast, in 2023, there were 700 registrations in January and 800 in February, for a cumulated total of 1500. The red solid line represents the percentage difference in the cumulative (since January) number of registrations for the corresponding months of the different year. This equals -25% ((1500-2000)/2000)*100) The year-on-year percentage change for February (the barplots) are calculated instead by comparing the number of registrations in February 2023 to the registrations in February 2019, which gives -20% ((800-1000)/1000)*100.

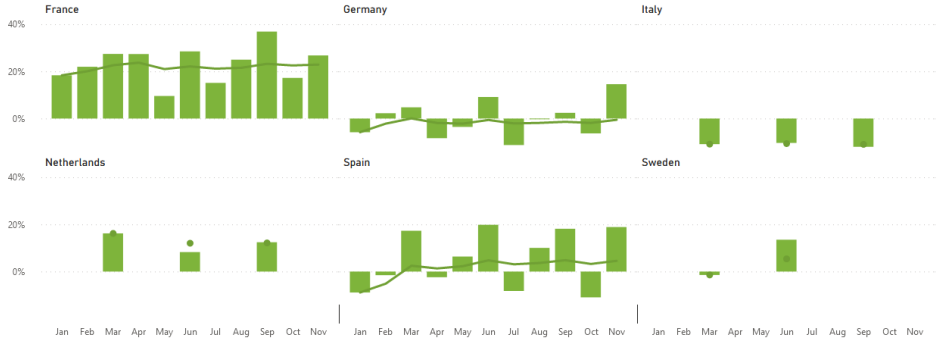
in the data. Overall, data suggest a slow-down in Luxembourg's business dynamism. BD data reveal a decline in entry, which started well before the pandemic outbreak. Trends during the pandemic are more difficult to assess. Bankruptcy statistics indicate a slow-down in exit. At the same time, after an initial decrease at the pandemic onset, the LBR show an increase in business registrations during the pandemic. This effect is also found in other countries, and is at odds with what was observed in past recessions, when business entry declined persistently after downturns (Dinlersoz et al., 2021). This is plausibly due to the characteristics of the pandemic shock. It is also plausible that governments' support measures might have affected indicators of business dynamism, but one would expect these effects to be temporary. The latest LBR observations signal that business entry is slowing down in Luxembourg in the first half of 2023. New data will be needed to assess which trend will prevail/persist in the second half of 2023.

Figure 3.18: Changes in business registrations in Luxembourg (2022 – 2023 vs 2019).



Source: monthly filings statistics from LBR. The bars indicate year-on-year percentage differences in monthly business registrations for 2022 on 2019 (left panel), and for 2023 on 2019 (right panel). The continuous line represents smoothed changes in registrations (from January to each month of 2022, or 2023) relative to the same period of 2019.

Figure 3.19: Changes in business registrations in selected European countries (2022 vs 2019).



Sources: (OECD, 2023a), OECD calculations based on official sources: INSEE (France); DESTATIS (Germany); LBR (Luxembourg); Movimprese (Italy); INE (Spain), Sweden, Statistics Sweden (Sweden). Bars indicate year-on-year percentage differences in business registrations (monthly data, quarterly data for Italy). The continuous lines represent smoothed changes in registrations registrations (from January to each month or quarter of 2022) relative to the same period of 2019.

4 Entrepreneurship: a cross-country perspective

This chapter presents a comparative analysis of entrepreneurship in Luxembourg based on global GEM data. The analysis covers Luxembourg and the other European countries participating in both the 2019 and 2022 waves of the APS. These data allow us to describe how Luxembourg's entrepreneurship compares to other countries, and provide additional insights on the country's recent entrepreneurial trends. The analysis considers the various stages of the entrepreneurship process, from potential to established entrepreneurship. Sections 4.1 focuses on the initial stages of entrepreneurship, illustrating comparative changes in entrepreneurial intentions and nascent entrepreneurship. Section 4.2 reports on perceptions of the business environment and attitudes towards risk. Next, section 4.3 presents the GEM indicators of entrepreneurial intensity, namely TEA and EBO. Section 4.4 reports changes in entrepreneurial motivations, while Section 4.5 reports on entrepreneurs' expectations on growth and perceived opportunities. Sections 4.6 documents entrepreneurial exits. The last section presents the entrepreneurs' perceptions of governments' responses to the pandemic (Section 4.7).

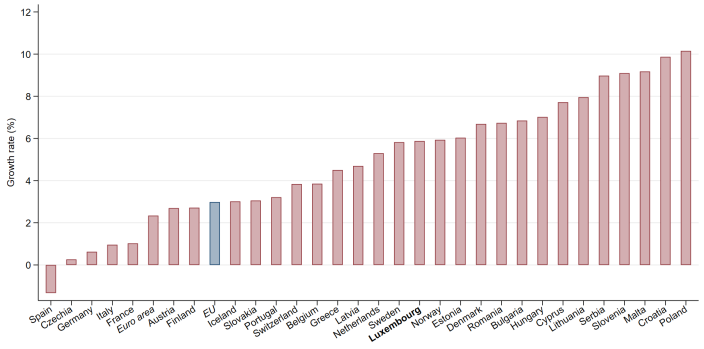
Overall, entrepreneurship indicators have deteriorated across Europe. While intentions and nascent entrepreneurship are increasing in Luxembourg and are comparatively high, the country's TEA has deteriorated considerably both compared to the 2019 benchmark and to other countries. Luxembourg's perceptions of the business environment and risk are in line with those of other countries. In contrast, entrepreneurs seem to perceive the economic outlook as challenging, and are possibly more pessimistic than their European counterparts. At the same time, they perceive the pandemic crisis as a time of opportunities, and more so than entrepreneurs in the other countries. As for features of entrepreneurship, Luxembourg has a much higher share of opportunity-driven entrepreneurs. Entrepreneurs in Luxembourg also rate particularly favourably the government's response to the pandemic crisis.

Exhibit: the economic outlook

Figure 4.1 shows growth rates of Gross Domestic Product (GDP) for the period 2019 – 2022 in EU-27 and EEA countries. On average, countries' GDP grew by about 3 % over the period. Luxembourg's economy, which weathered well the pandemic, grew by 6 %. These figures, however, mask considerable variations across countries — ranging from the negative growth of Spain to the 10% growth of Poland and Croatia — and over time. Indeed, the onset of the coronavirus pandemic caused a sudden worldwide economic shock. In 2020, GDP was, on average, 6.2% lower than the previous year in European countries. In the following two years, the sustained economic recovery has been accompanied by increases in energy prices and inflationary pressures. The overall economic outlook is now one characterised by considerable uncertainty.

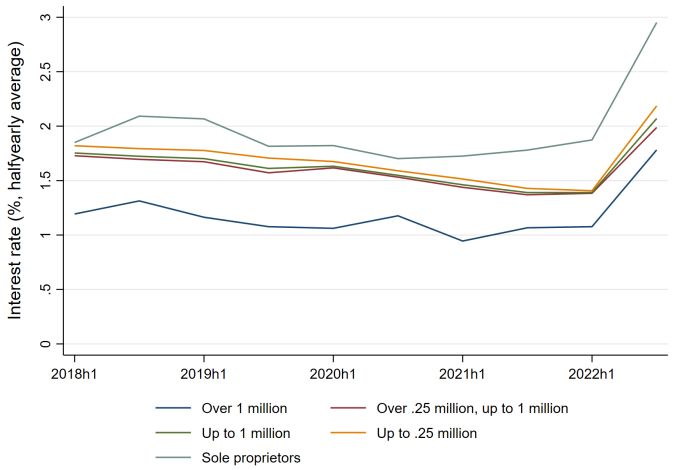
Inflationary pressures have led to a rise in interest rates. This typically affects the entire structure of interest rates and, as a result, also firms' financing conditions. Interest rates on loans are an important economic indicator for entrepreneurship, because they affect the cost of business investment and associated borrowing. Figure 4.2 presents the evolution of interest rates from 2018 to 2022, and one can see the spike in interest rates which marked the second half of 2022.

Figure 4.1: Real GDP growth rate in EU-27 and EEA countries (2019 – 2022).



Source: authors' calculations on Eurostat, 2022 data. Figures are cumulative growth rates, computed by comparing 2022 GDP levels to those of 2019. The average is computed as a weighted average of all countries considered. The graph does not include the 35% cumulative growth registered by Ireland between 2019 and 2022. This omission is due to the fact that the substantial growth primarily stems from the activity of multinational companies through net exports (EU Commission, 2023), including large IT and pharmaceutical multinational firms(Reid, 2023). The presence of such activity poses challenges in comparing domestic economic activities across different countries.

Figure 4.2: Interest rate on loans by amount of the loans (2018 – 2022).



Source: European Central Bank 2018-2022. The "h" in the horizontal labels denotes semesters. Figures are half-year averages.

4.1 Entrepreneurial intentions and nascent entrepreneurship

Crises can affect the entire entrepreneurship cycle, from entry to exit, in different ways. At entry, they might lead to a generation of missing entrepreneurs, but also contribute to new business opportunities. The previous chapter also showed that different types of entrepreneurship follow different patterns along the business cycle. Hence, the overall effect of crises on entrepreneurship is complex and difficult to assess. What follows attempts to assess the state of entrepreneurship in Luxembourg in a comparative perspective, with special attention to the effect of COVID-19 crisis. (The charts in the remainder of this chapter compare the indicators of interest for the years 2022 and 2019. They cover Luxembourg and 13 other European countries for which observations are available for both years; averages refer to this group of countries.)

We first present indicators for the initial stages of entrepreneurship, as these stages are crucial for a healthy entrepreneurial dynamism.

GEM produces several indicators that help assessing the evolution of entrepreneurial intentions and entry. They can provide information on two important concerns — the missing generation of entrepreneurs[1] and the decline in the number of start-ups[2] — with potentially vast economic consequences. Potential entrepreneurs are those respondents that declare having entrepreneurial intentions. Nascent entrepreneurship captures entrepreneurial entry.[3]

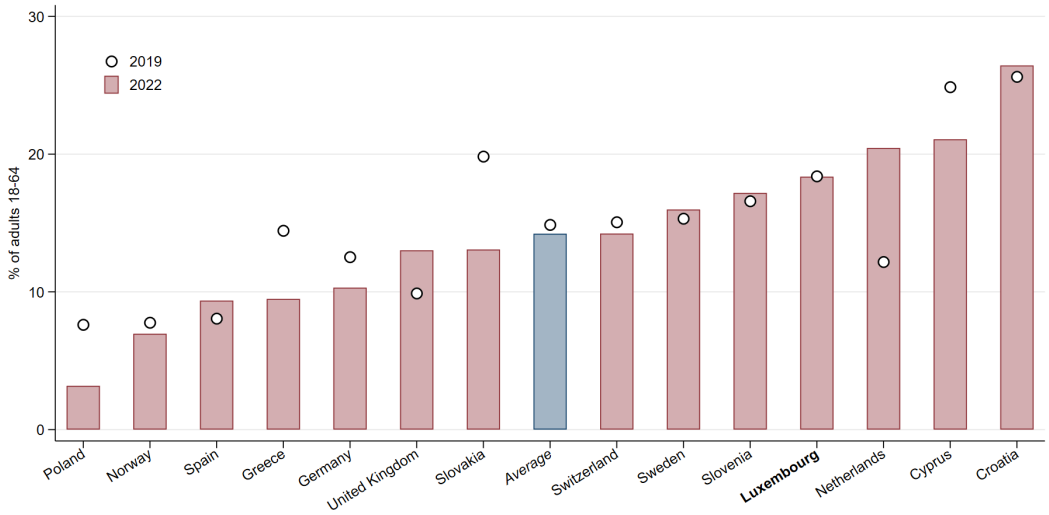
Luxembourg GEM data show that the share of **potential entrepreneurs** reached the lowest point since data collection began in 2020, but had broadly recovered by 2022 (see Section 3.1). Figure 4.3 provides additional information, showing that overall, there has been a decrease in **entrepreneurial intentions**, with wide variations across countries. Luxembourg's share of potential entrepreneurs is relatively high and above average.

[1] The missing generation of entrepreneurs refer to those who would have started a business if the pandemic had not happened.

[2] According to Sedlacek and Sterk (2020), the decline in the number of start-ups observed during the pandemic could result in more than 1,5 million job losses in the US. Similarly, the OECD (2020) argues that a reduced number of start-ups has long-term implications in terms of aggregate employment. In particular, a 20% drop in the number of start-ups leads to an employment decline of 0.7% of aggregate employment 3 years after the shock, and still of 0.5% 14 years after.

[3] The share of "nascent entrepreneurs" is a component of TEA. Nascent entrepreneurs are those that are currently trying to setting up a new business, and have paid wages (to employers or themselves) for less than three months. See also Section 3.1.

Figure 4.3: Potential entrepreneurs in Europe.



Source: 2022 and 2019 GEM Global APS data. Percentage share of adults (population of 18-64 years of age) that declare having entrepreneurial intentions.

Global GEM data reveal that one of the consequences of the COVID-19 pandemic was a reduction in the number of nascent entrepreneurs and in the creation of new businesses (GEM, 2023).

According to Global GEM data, on average the share of individuals who are classified as **nascent entrepreneurs** in 2022 was slightly lower than in 2019, but cross-country variations were considerable. This is shown in Figure 4.4. In Luxembourg, the share of adults starting a business has decreased over the period, but this figure is still well above the European average (13%).[4]

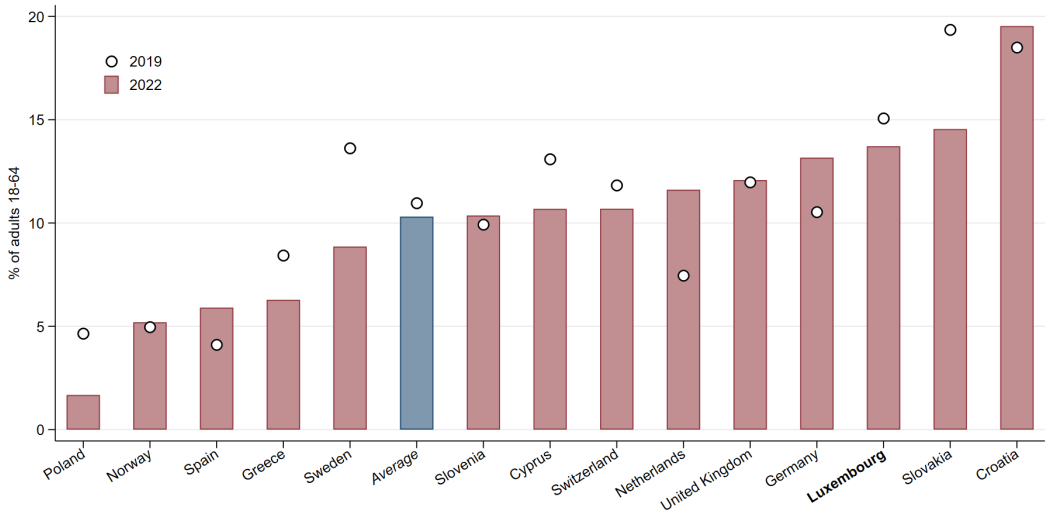
4.2 Perceptions and attitudes towards risk

It is plausible that entrepreneurial intentions and entry patterns reflect the changes in the economic outlook, the crises, and the increased uncertainty faced by businesses, also through changes in expectations and perceptions of the business environment. Thus, this section examines GEM Global data on perceived opportunities. We also look at personality traits and attitudes, as the interaction of these variables with perceptions and context affect individuals' decisions to engage in entrepreneurship.

The decision on whether to become an entrepreneur is influenced by the interaction of personality traits, attitudes and perceptions of the surrounding environment (e.g. Boyd and Vozikis, 1994). Perceived business opportunities, attitude towards risks,

[4] It also represents a considerable improvement from the all-time low of 9 % recorded in 2020, signalling a recovery.

Figure 4.4: Nascent entrepreneurs in Europe.



Source: 2022 and 2019 GEM Global APS data. Percentage share of adults (population of 18-64 years of age) that are currently trying to start a new business.

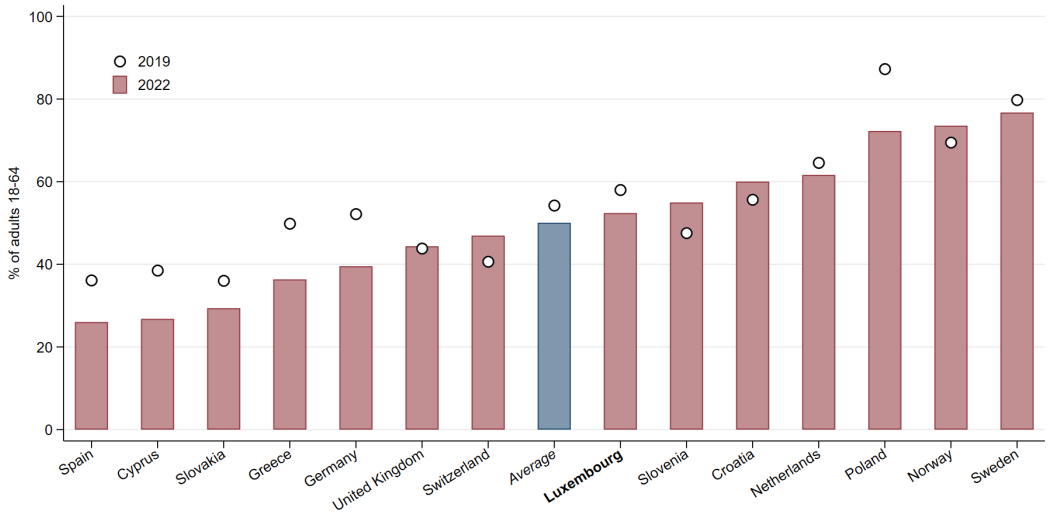
and confidence in one's abilities are among the factors that affect entrepreneurial entry. Individuals' perceptions of the business environment are affected by changes of the overall economic outlook, while personality traits are typically more stable over time. The perception of favourable conditions and business opportunities may lead to an increase in entrepreneurial intentions (Linan, 2008). Conversely, the perception of a negative economic outlook may discourage those intentions and, as a result, the creation of new businesses (Koellinger and Thurick, 2012). Turning the intentions of pursuing entrepreneurial activities into practice, however, also requires the confidence in one's abilities, as well as overcoming fears about the possible failure of the new venture.

The GEM APS includes specific questions to survey these aspects. Specifically, it asks respondents whether they agree that there are good opportunities to start a business. It also asks adults whether they have the skills to start a new business, and if they would not start a new business for fear it might fail.

Figure 4.5 presents the share of individuals agreeing that there are **good business opportunities** in 2022 and 2019 across 14 European countries. Results show that, on average, this share dropped from 51% in 2019 to 45% in 2022. In 9 out of the 14 European economies, including Luxembourg, the share of individuals that perceived good opportunities to start a business declined over the period. Luxembourg figures are close to average.[5]

[5] Numbers for Luxembourg differ from the ones reported in Chapter 3, figure 3.2, due to different computation strategies adopted by the consortium for compiling the global dataset. Specifically, Global GEM considers only four categories of responses, rather than the five of Luxembourg's dataset, which includes the neutral category in a 1-5 Likert scale.

Figure 4.5: Good opportunities to start a business in next 6 months.



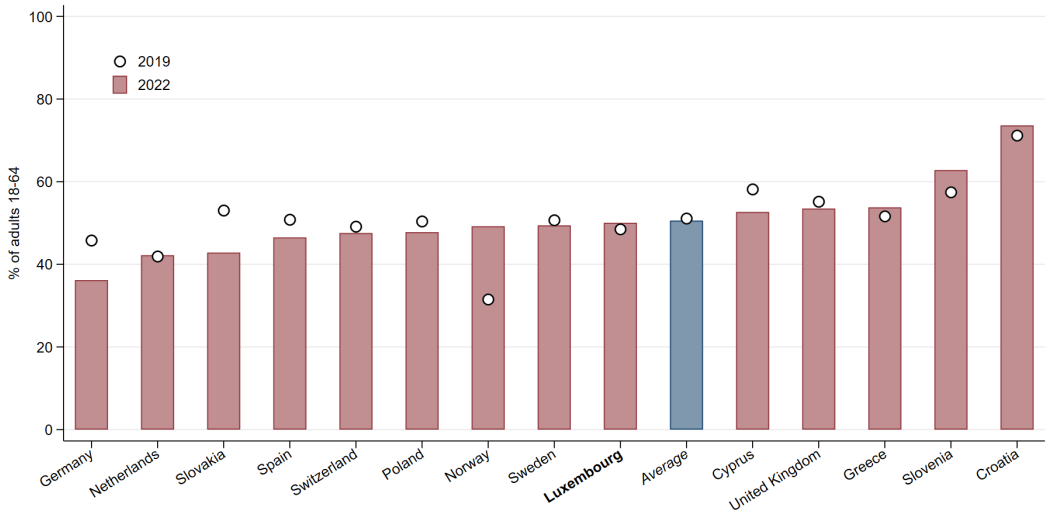
Source: 2022 and 2019 GEM Global APS data. Percentage share of adults (population of 18-64 years of age) that strongly agree or somewhat agree with the statement "There are good opportunities to start a business in next 6 months".

Figure 4.6 reports the share of the adult population that declare possessing the **required knowledge, skills, and experience to start a business**. As expected, the share of adults who report to have the required skills to engage in entrepreneurship remained stable over the period. In Luxembourg, this share is in line with the cross-country average, and is close to 50 % of respondents.

Figure 4.7 shows the share of the adult population who sees good opportunities, but does not start a business for fear it might fail. One can see an overall increase in **fear of failure** over the period. Luxembourg shows little variation between 2019 and 2022, with values in line with the average in 2022. Fear of failure in the country is just above 40%.

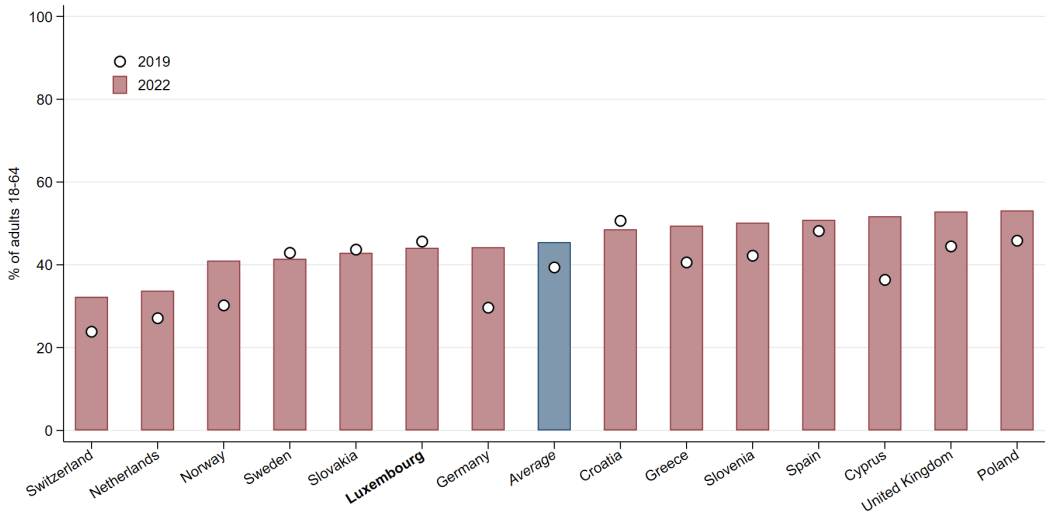
Despite the pandemic, the data do not reveal any persistent changes in self-perceived skills or in fear of failure. This result is perhaps surprising, in light of a scenario which looked challenging for entrepreneurs. It is plausible that government aids and measures to support the economy contributed to mitigating the fear of failure, at least during the period when the surveys were carried out. A possible alternative, or complementary, explanation is that some respondents might have envisaged new opportunities. Additionally, self-perceptions and fears are related to personality and behavioral traits that typically do not vary considerably from year to year.

Figure 4.6: You personally have the knowledge, skills, and experience required to start a business.



Source: 2022 and 2019 GEM Global APS data. Share of adults (population of 18-64 years of age) that strongly agree or somewhat agree with the statement.

Figure 4.7: You see good opportunities, but would not start a business for fear it might fail.



Source: 2022 and 2019 GEM Global APS data. Share of adults (population of 18-64 years of age) that strongly agree or somewhat agree with the statement.

4.3 Early Stage Entrepreneurial activity (TEA) in Europe

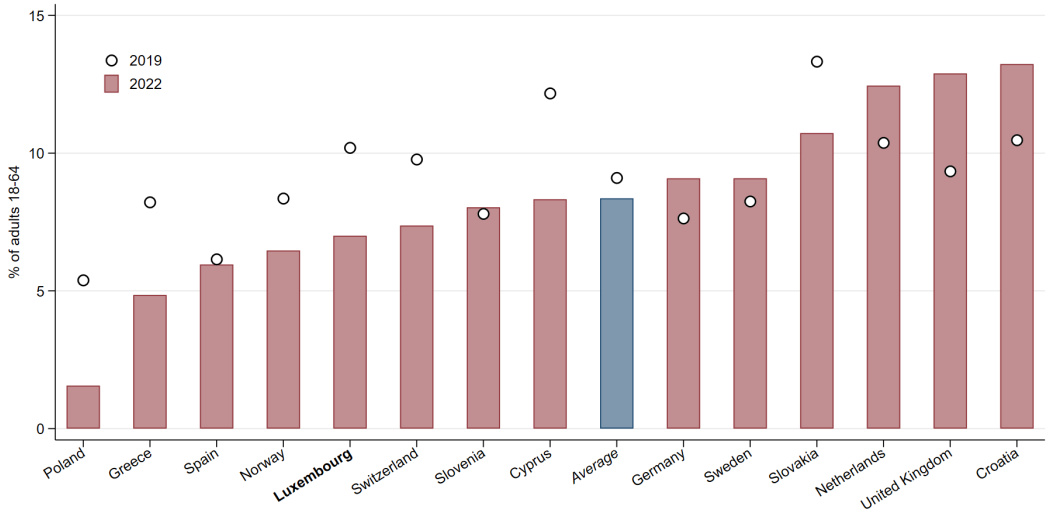
The GEM framework features two key indicators capturing the intensity of entrepreneurial activities in a country (see Section 2.1):

1. **Total early-stage Entrepreneurial Activity (TEA)**: individuals involved in setting up a business or running a firm younger than 42 months that has paid wages during the last three months, measured as a percentage of the adult population;

2. Established Business Ownership (EBO): owner-manager of firm older than 42 months that has paid wages during the last three months, measured as a percentage of the adult population.

Previous reports highlighted a generalised reduction in TEA during the pandemic. In other words, the share of adults starting or running a new business largely declined across countries. The latest wave of data allows us to gauge whether this feature persisted, or whether there has been a rebound in entrepreneurial activity. Figure 4.8 compares TEA levels in the years 2022 and 2019 across countries. In 2022, TEA is still lower than in 2019. This reflects lower — at times substantially lower — TEAs in 7 out of the 14 European countries. Luxembourg belongs to this group of economies, featuring a large drop in TEA over the pandemic years. Comparatively, the country's TEA is below average in 2022 (it was higher in 2019).

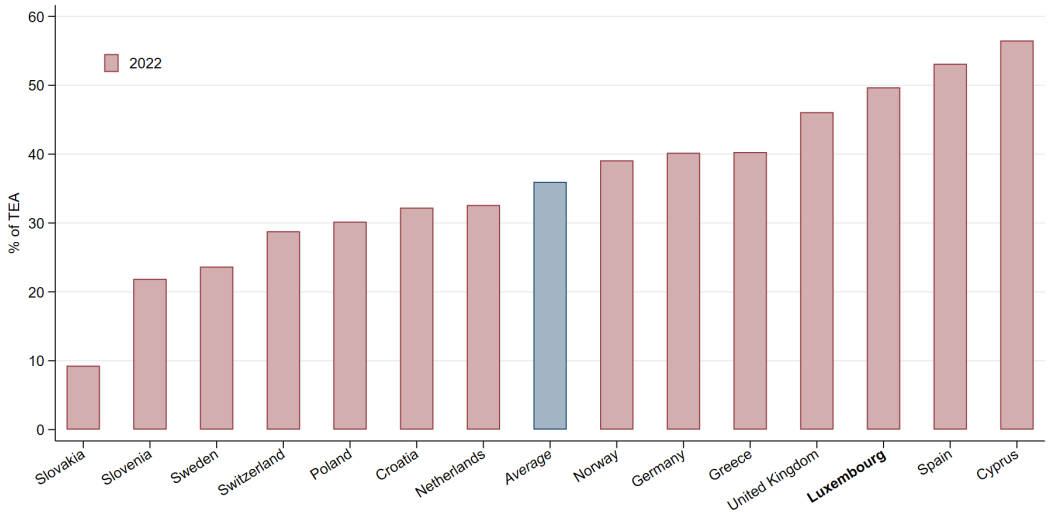
Figure 4.8: Total Early-stage Entrepreneurial Activity (TEA) in Europe.



Source: 2022 and 2019 GEM Global APS data. Percentage share of adults (population of 18-64 years of age).

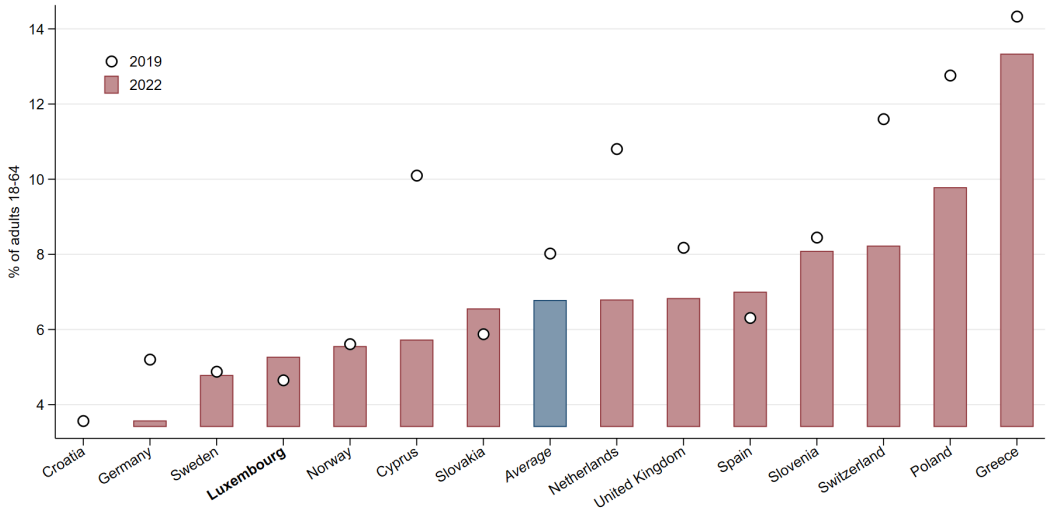
On average, about 30% of the early-stage entrepreneurs surveyed by GEM reported that **setting up a business was harder in 2022** than it was in the previous year (Figure 4.9). In Luxembourg, the perceived difficulties in starting up were above average, with 50% of TEA entrepreneurs declaring that starting a business was more challenging in 2022 than in 2021.

Figure 4.9: Starting a business is more difficult compared to a year ago (% of TEA)



Source: 2022 and 2019 GEM Global APS data.

Figure 4.10: Established Business Ownership (EBO).



Source: 2022 and 2019 GEM Global APS data. Percentage share of adults (population of 18-64 years of age).

Figure 4.10 reports the level of EBO for 2022 and the 2019 benchmark. In a majority of countries, data show that the share of adults **running an established business** decreased. This decrease was of considerable magnitude in several countries. This is reflected in an average EBO of just above 6 %, lower than the 8 % recorded in 2019 for the same group of countries. The 2022 data show that, while some economies recovered, notably Norway, others such as Switzerland, and the Netherlands con-

firmed their substantial fall in EBO. Luxembourg, which has traditionally featured a low level of EBO and is below average (GEM, 2018a), sees a slight improvement compared to the pre-pandemic year.

Overall, when compared with the the other European countries, the reduction in TEA looks considerable for Luxembourg. EBO, however, shows a small improvement: albeit still one of the weakest rates of established businesses in GEM's Europe, it is at an all-time high for Luxembourg in 2022 (see Chapter 3).

4.4 Entrepreneurial motivations: necessity and opportunity-driven entrepreneurs

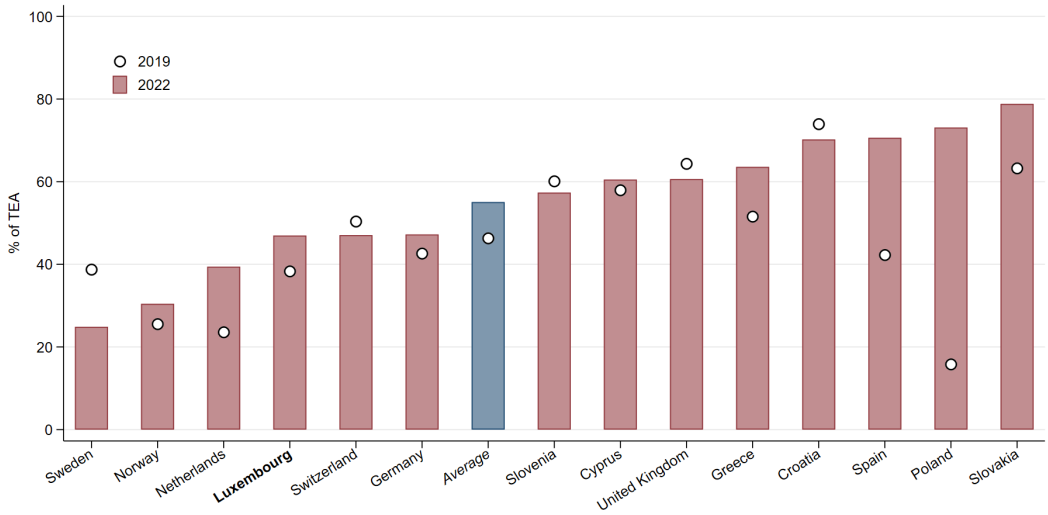
In the previous sections, we documented an overall reduction in entrepreneurial activities compared to the pre-pandemic benchmark. This section explores the distinction between opportunity-driven versus necessity-driven entrepreneurship using the cross-country dataset. Recall that the former refers to people engaging in entrepreneurial activity due to the emergence of business opportunities, whereas the latter refers to individuals that are "forced" to choose entrepreneurship because of the inability to find paid employment (see also Section 3.4). As discussed in the previous chapter, the distinction opportunity vs. necessity (between entrepreneurs with high vs low growth prospects) helps us capture differences and changes in the composition and quality of entrepreneurship.

To investigate this, the GEM APS asked those individuals starting or running a new business whether they started this activity to make a difference in the world (a proxy for opportunity-driven entrepreneurs), or because there were fewer job opportunities (i.e. necessity-driven entrepreneurs).

Figure 4.11 shows the percentage of those starting or running a new business who agree that their motivation is "to earn a living because jobs are scarse" during 2019 and 2022. As expected, across Europe by 2022 on average 55 % of business were now created for necessity compared to 46 % previously. (Some countries experienced a dramatic increase in necessity-drive entrepreneurship, while in other countries the increase was moderate.) Necessity-driven entrepreneurship moderately increased in Luxembourg as well, moving from 38% to 47%. (This was up from the 44% recorded in 2020.) Luxembourg has one of the lowest shares of **necessity-driven entrepreneurship** (47% against an average of 55%).

Opportunity-driven entrepreneurship featured a moderate decrease, on average from 45 to just above 42 % in 2022. Almost all countries featured either a moderate

Figure 4.11: Motivation is “to earn a living because jobs are scarse” (% of TEA).



Source: 2022 and 2019 GEM Global APS data. Figures are percentage share of TEA entrepreneurs.

decline or a stable share of individuals setting up a firm to make a difference in the world in 2020 (Figure 4.12). Luxembourg, which typically features a very high share of opportunity-driven entrepreneurship in cross-country comparison, saw a moderate overall decline, from 60.5% to 56%. Notwithstanding, Luxembourg still features a very high share of opportunity-driven entrepreneurship (56% against an average of 42%).

Overall, the data confirm the patterns observed during downturns, with a growth in necessity-driven entrepreneurship (Bosma and Levie, 2010), and suggest that the pandemic has led to a deterioration in entrepreneurial activity not only in terms of volume, but also in terms of composition and "quality".

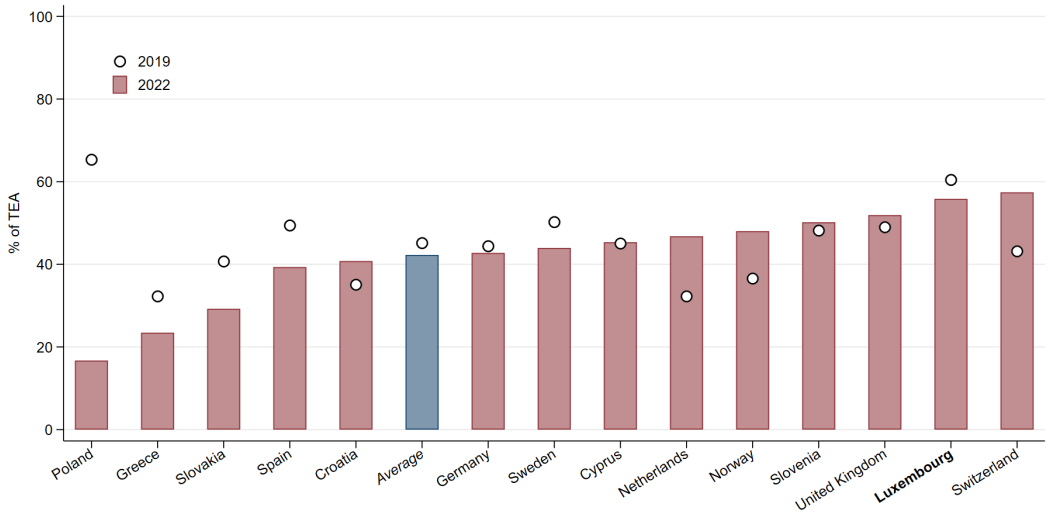
4.5 Growth expectations and new opportunities

Economic downturns generally hamper the growth of young and small entrepreneurial firms (Fort et al., 2013; Bartz and Winkler, 2016).[6] Crisis, however, might also represent a force of “creative destruction”, from which innovation and business opportunities emerge.

The pandemic has represented a considerable challenge for entrepreneurship: GEM data shows that it made it more difficult for entrepreneurs to start and run a business. This section looks at whether the pandemic negatively affected future

[6] Recent research for Belgium confirms that during the pandemic young business growth was more severely affected than that of older firms (Konings and Yergabulova, 2021).

Figure 4.12: Motivation is "to make a difference in the world" (% of TEA).



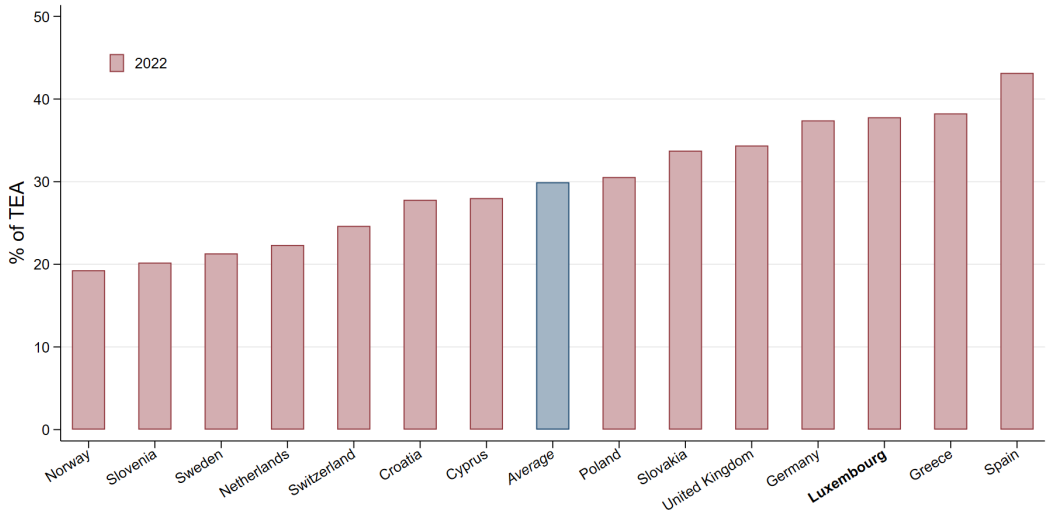
Source: 2022and 2019 GEM Global APS data.

growth prospects for both new and established businesses, or whether it has created new opportunities.

To examine the effects of COVID-19 on the future expectations of entrepreneurs, GEM enquired about their **expectations on future business growth**. Figures 4.13 and 4.14 report the share of TEA and EBO respondents that declared to have lower growth expectations compared to the past. Data reveal that a considerable proportion of entrepreneurs had lower growth expectations in 2022 than the previous year. About one third of both TEA (30%) and EBO (36%) entrepreneurs had lower growth expectations than the previous year. (This, however, represents a considerable improvement compared to the pandemic onset, 2020, when 50% of EBOs saw bleak growth prospects.) In Luxembourg, the shares of both TEA entrepreneurs and EBOs reporting lower growth expectations was higher than the European average.

As said above, recessions are often regarded as times of "creative destruction" characterized by the emergence of successful entrepreneurs and innovative start-ups. Disney, Microsoft, Oracle, Hewlett-Packard, and, more recently, Airbnb, Dropbox, Pinterest, Uber, and WhatsApp, were all founded during economic downturns. An additional example is Alibaba's Taobao founded during the SARS pandemic in China. In the short-term, the pandemic has resulted in the introduction of several radical innovations in tele-medicine, remote personal care, home delivery, food processing, teleworking, online education, and contact tracing (OECD, 2020). In the long-term, the COVID-19 outbreak may provide opportunities for those entrepreneurs that are

Figure 4.13: Growth expectations are lower than one year ago (% of TEA).



Source: 2022 GEM Global APS data.

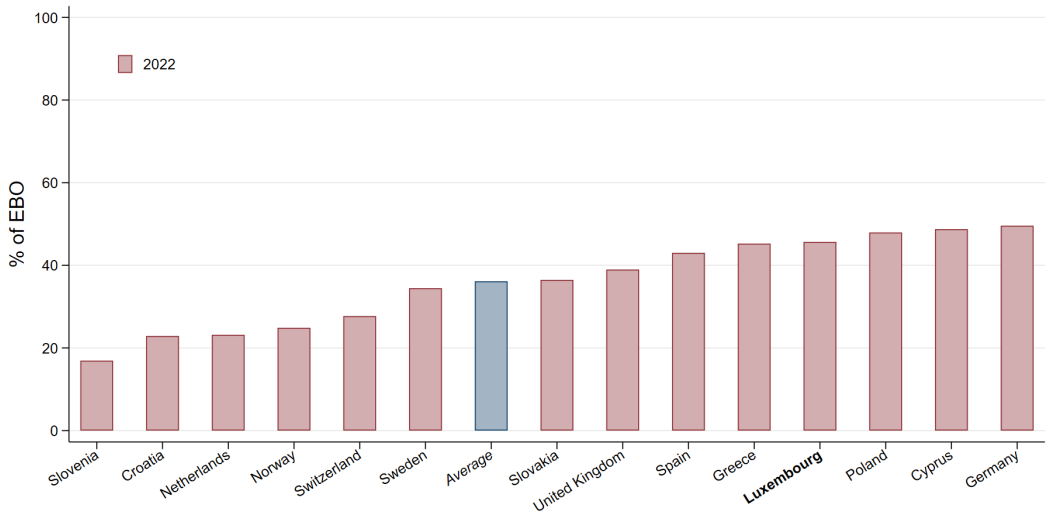
able to anticipate permanent changes involving, for example, demand for remote working, e-commerce, education and health services.[7]

Thus, the GEM APS asked TEA and EBOs entrepreneurs whether the coronavirus pandemic had provided new business opportunities they intend to pursue, or that they are currently pursuing. Answers are reported, respectively, in figures 4.15 and 4.16. On average, 40% of TEA entrepreneurs, and 30 % of EBOs agreed that the pandemic provided new opportunities to pursue.[8] Results for Luxembourg are striking, with about 50 % of entrepreneurs answering that the pandemic represented an opportunity for businesses. This supports the view that the current crisis represents a challenge but also an opportunity, at least potentially.

[7] Start-ups can help address the challenges presented by the economic, health and societal effects linked to the pandemic. For these reasons, the European Innovation Council of the European Commission has created a specific R&D grant call for start-ups with technologies related to treating, testing, monitoring or other aspects of the COVID-19 outbreak. In Luxembourg, the government has implemented specific measures to leverage start-ups' talent and innovative capabilities such as the Startup vs COVID-19 or Hack the Crisis (e.g. see `https://www.startupluxembourg.com/support-measures-startups`).

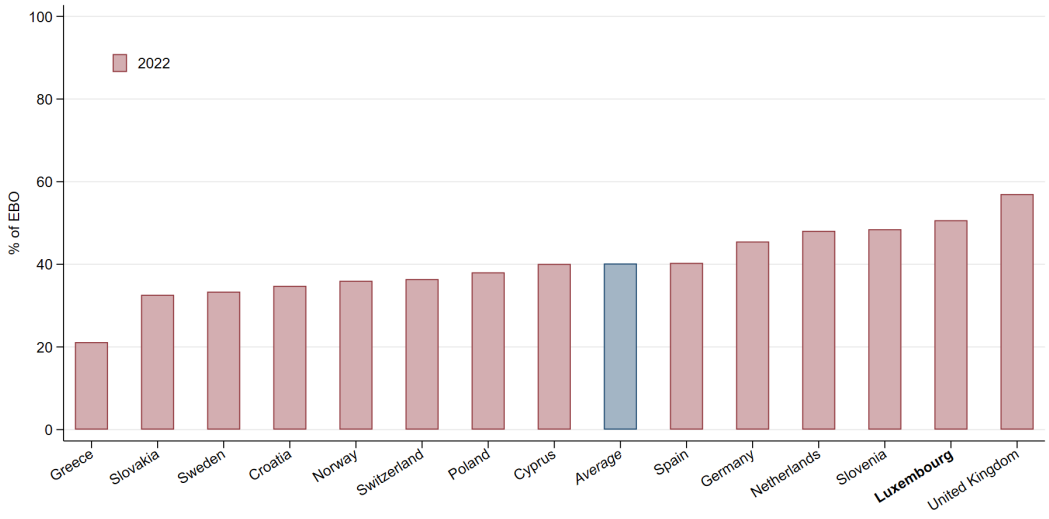
[8] A possible reason for the discrepancy in views between established business owners and start-up owners, also observed in global GEM data, could be that the latter have a more prudent view as opposed to early-stage entrepreneurs who might be inclined to be more optimistic about the future (GEM, 2023).

Figure 4.14: Growth expectations are lower than one year ago (% of EBO).



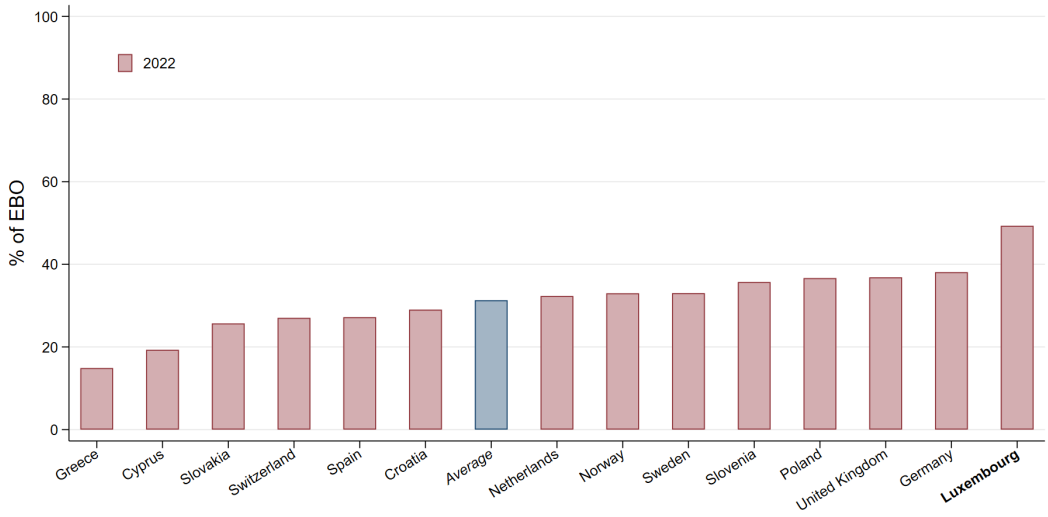
Source: 2022 GEM Global APS data.

Figure 4.15: New opportunities thanks to the pandemic (% of TEA).



Source: 2022 GEM Global APS data.

Figure 4.16: New opportunities thanks to the pandemic (% of EBO).



Source: 2022 GEM Global APS data.

4.6 Entrepreneurial exit

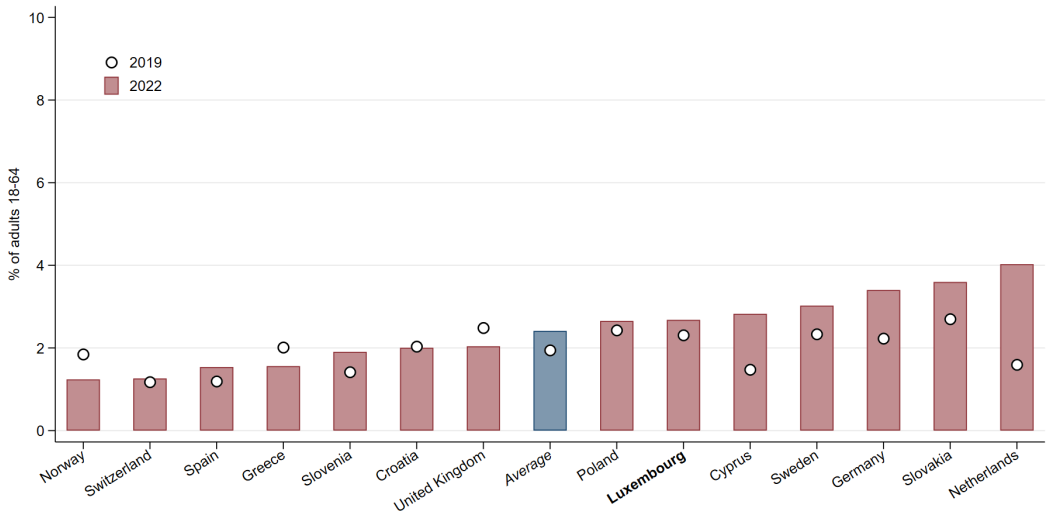
During the pandemic, government economic policy interventions have been rapid and unprecedented. They have allowed firms to access resources to stay afloat and avoid bankruptcy. In many advanced economies, rapid government interventions have financed job support programs to assist workers and to temporarily halt bankruptcy procedures – providing lifelines to keep firms alive through the crisis, at a time when premature bankruptcy could have worsened the recession (Muro, 2020). The implementation of these interventions avoided a surge in business closures due to the severe contraction of economic activity during the first half of 2020 (Demmou et al., 2021).[9] Questions were raised on what would happen once extraordinary interventions would be phased out, and/or whether government interventions were disrupting business dynamics (for example, the debate on zombie firms). In this section we examine the recent evolution of business exits.

The GEM APS asked all respondents if, in the last 12 months, they have discontinued or quit a business they owned and managed. The results, plotted in Figure 4.17, show an overall increase in discontinued businesses in 2022 compared to 2019, with a few exceptions. Luxembourg saw a small increase in the share of discontinued businesses, comparable to the average.

To better understand the impact of the pandemic on closures, the GEM APS asked those respondents who discontinued a business if this was due to the COVID-19 crisis. In Luxembourg, only 5 % of those that discontinued a business declared to have done so due to the pandemic in 2022, the second lowest share among the countries considered. On average, about 16 % of those who discontinued a business reported to have done so because of the pandemic (see Figure 4.18). Data, however, reveal a considerable heterogeneity across countries, going from the 3.7% reported in Sweden to the 58% observed for Poland. This confirms previous findings, that is, for Luxembourg the coronavirus crisis did not appear as a central determinant of business closures.

[9] Gourinchas et al. (2020) using data from seventeen countries estimated that, absent government support, the failure rate of SMEs would have increased by 9.1 percentage points, representing 4.6 percent of private sector employment. According to Ebeke et al. (2021), the absence of a surge in business exits during 2020 might also be linked to the fact that businesses in advanced economies entered the COVID-19 pandemic in a much better shape in terms of corporate profitability, levels of indebtedness, and presence of initial cash buffers as compared to the Great Recession, when business exits spiked. Moreover, the closure of courts during the lockdowns and change in bankruptcy laws might also have played an important role in keeping bankruptcies low – at least for the time being (Fareed and Overvest, 2021).

Figure 4.17: Share of adults discontinuing a business in the last 12 months (% of adults 18-64).



Source: 2022 and 2019 GEM Global APS data.

4.7 Governments' response to the pandemic

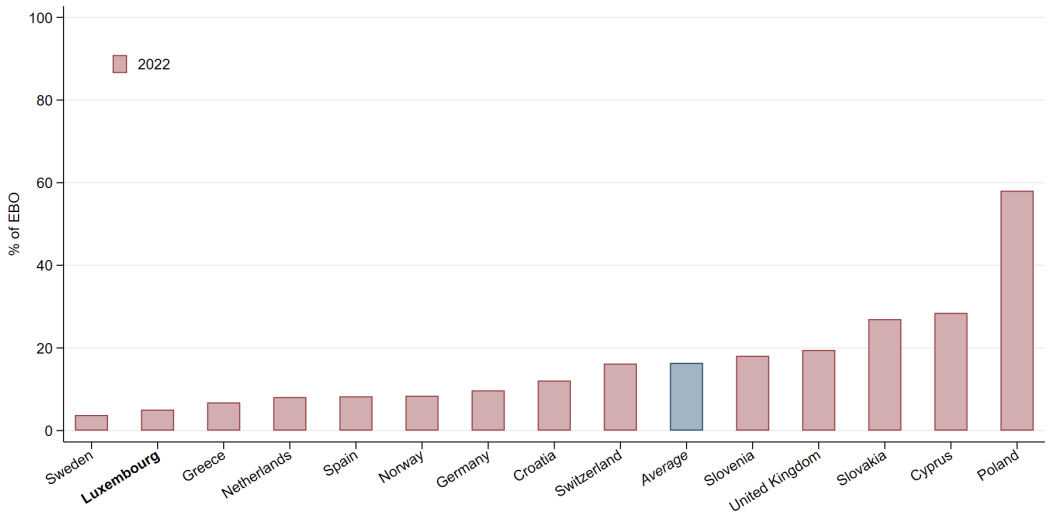
During the pandemic, governments worldwide have put in place a wide range of stimulus and support measures to mitigate the unprecedented challenges to the business economy. Support measures for entrepreneurs and small businesses were initially focused on providing emergency liquidity support in various forms, and on safeguarding employment, but were gradually accompanied by more structural and broader recovery packages (OECD, 2021a).

In Luxembourg, the government's response included measures to address possible firms' cash shortages and prevent insolvency. Policy measures were also aimed at supporting innovative start-ups with extraordinary provisions. Additional programs were tailored to innovative business developing solutions against the COVID-19 pandemic through R&D grants.[10]

Throughout the pandemic, GEM has asked entrepreneurs whether the government effectively responded to the economic consequences of the coronavirus. While we do not survey each individual measure, data indicate an overall positive appreciation of

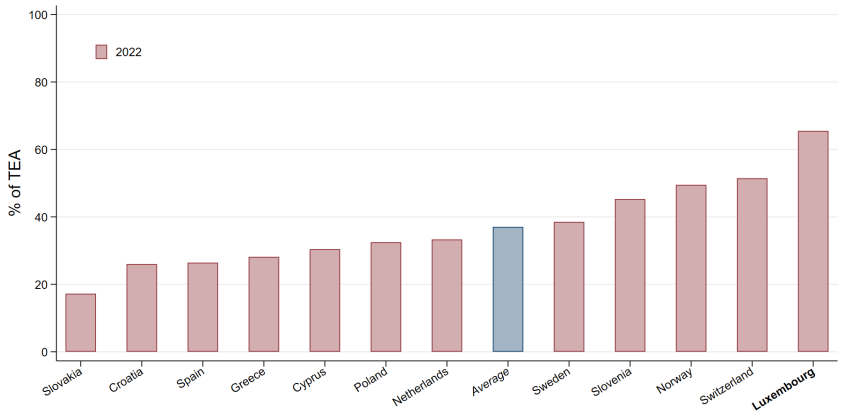
[10] A comprehensive list of measures adopted in Luxembourg to help start-ups navigate the COVID-19 pandemic is available here: `https://www.cc.lu/en/covid19/business-support/complete-list/`. Additionally, the government set up schemes to alleviate the liquidity situation of businesses and self-employed individuals, expanded the short-time working scheme ("chômage partiel") to all companies, and facilitated extraordinary leave for those parents having to look after their children following school closures. A list of initial policy measures adopted in Luxembourg and other OECD countries to help businesses in response to the pandemic is available here: `https://www.oecd.org/coronavirus/policy-responses/coronavirus-covid-19-sme-policy-responses-04440101#section-d1e18288`.

Figure 4.18: Business discontinued due to the pandemic (% of those who discontinued a business).



Source: 2022 GEM Global APS data.

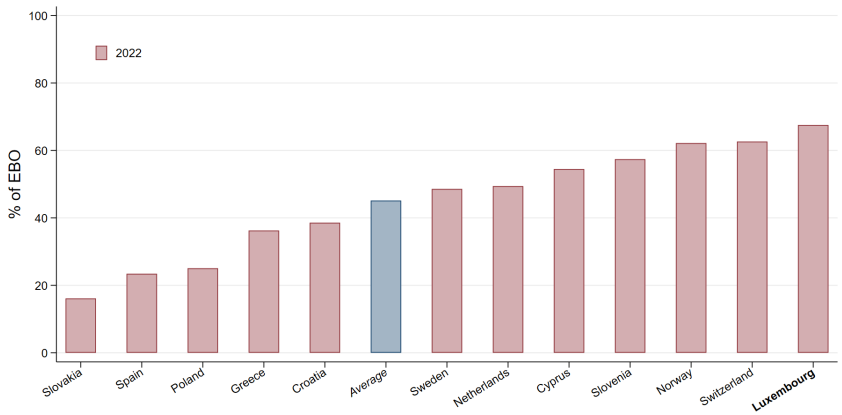
Figure 4.19: Government response to the economic consequences of the pandemic (% of TEA)



Source: 2022 GEM Global APS data. Data for Germany and the United kingdom are not available.

government efforts in tackling the pandemic. Around 65% of early-stage entrepreneurs agreed that the response was indeed satisfactory (Figure 4.19). Established business owners reported similar levels of satisfaction (Figure 4.20). Comparatively, Luxembourg scoresfirst, with the highest share of satisfied entrepreneurs in the group of countries considered.

Figure 4.20: Government response to the economic consequences of the pandemic (% of EBO)



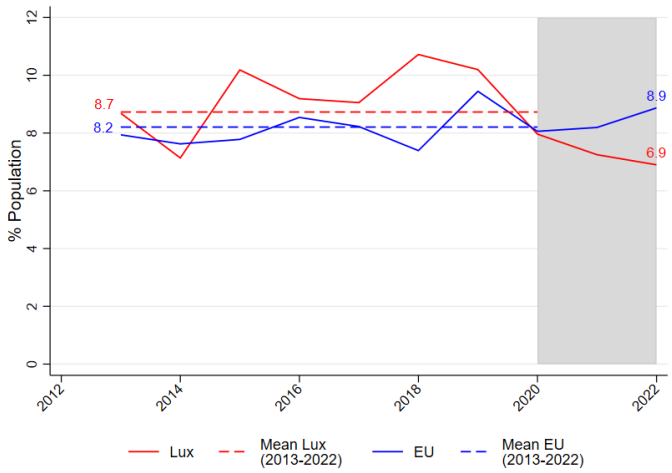
Source: 2022 GEM Global APS data. Data for Germany and the United kingdom are not available.

Exhibit: Entrepreneurship in Luxembourg and European average (2013 – 2022)

This exhibit analyses the comparative evolution of entrepreneurial intensity in Luxembourg and European countries over the period 2013-2023. It compares the rates of potential, TEA, established, and discontinued entrepreneurs for Luxembourg to the European averages of the same indicators.

Figure 4.21 reveals that Luxembourg has consistently exhibited a higher TEA rate than other European countries. From 2013 to 2020 the country's TEA has been sustained, reflected in a period-average TEA of 8.7%, compared to the 8.2% for Europe. However, since 2019 and more markedly since the pandemic outbreak, Luxembourg's TEA has been declining. In contrast, European countries TEA has rebounded during the same period. The figures in the chart indicate a favourable entrepreneurial environment for Luxembourg, but also suggest a potential shift in entrepreneurial dynamics, with Luxembourg facing challenges in sustaining its levels of entrepreneurial activity.

Figure 4.21: Rate of TEA entrepreneurs in Luxembourg and Europe (2013 – 2022).

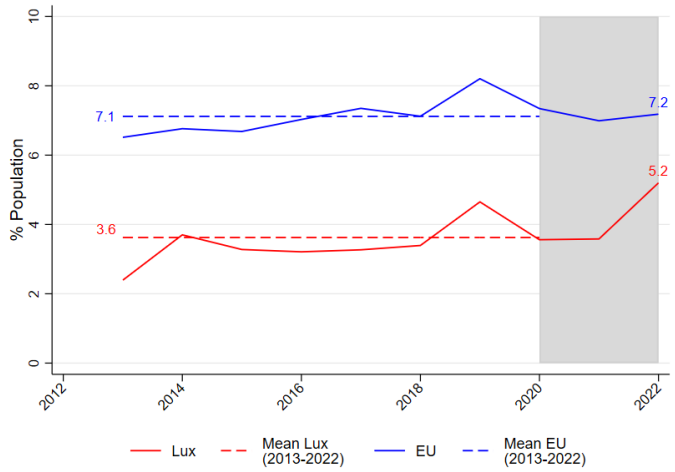


Source: 2013 – 2022 GEM Luxembourg and global APS data. EU refers to the entire set of European countries participating in GEM in a given year.

Figure 4.22 shows that Luxembourg has a lower proportion of established businesses (3.6 %) compared to the EU average (7.1%) over the entire period. This gap might indicate that the transition from early-stage ventures to established

companies can be generally difficult. The 2022 data indicate an increase in the rate of established business for Luxembourg (5.2%), with a partial catch-up towards the EU average.

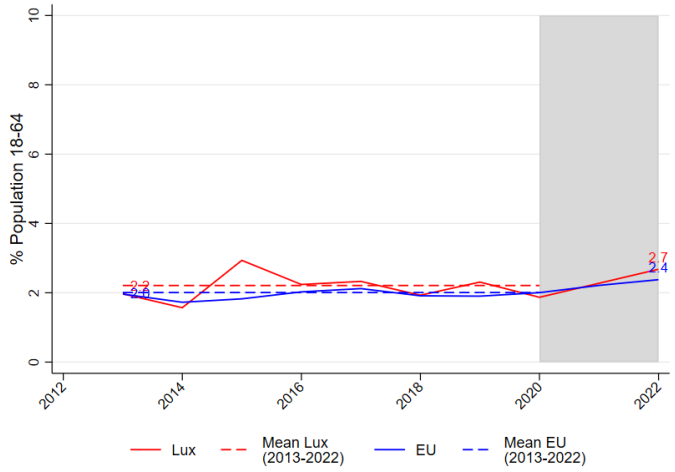
Figure 4.22: Rate of established entrepreneurs in Luxembourg and Europe (2013 – 2022).



Source: 2013 – 2022 GEM Luxembourg and global APS data.

Figure 4.23 documents that the proportion of entrepreneurs discontinuing their businesses is relatively stable and comparable between Luxembourg and European countries.

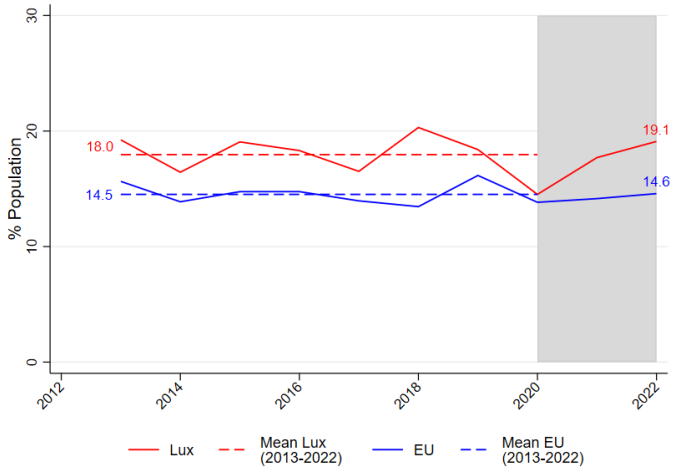
Figure 4.23: Rate of discontinued entrepreneurs in Luxembourg and Europe (2013 – 2022).



While the continued decline in TEA is worrisome, expectations about starting a business in Luxembourg contribute to a more favourable outlook. Entrepren-

eurial intentions have been consistently higher than the European average, and are rebounding, as depicted in Figure 4.24.

Figure 4.24: Rate of potential entrepreneurs in Luxembourg and Europe (2013 – 2022).



Source: 2013 – 2022 GEM Luxembourg and global APS data.

5

Entrepreneurial framework conditions: the NES survey

The GEM research project places emphasis on the social, cultural and economic context as a factor which contributes to shaping and fostering entrepreneurship. This section provides an assessment of the entrepreneurial environment characterizing Luxembourg in a cross-country perspective. We use data collected through the National Expert Survey (NES) (see Chapter 2 for a more detailed description).

GEM assesses the national contexts using a set of Entrepreneurship Framework Conditions (EFCs), which comprise factors that have been shown to be connected with a thriving entrepreneurship. These EFCs are listed in Table 5.1. The GEM NES interviews at least 36 national experts (four per EFC) for each economy every year. Each expert completes the NES questionnaire, which includes an assessment of the extent to which the statements about the EFCs are - on an 11-point Likert scale - completely untrue (0) to completely true (10). Then, the assessments are pooled and converted into an overall score for each EFC at the country level. This provides 13 overall scores evaluating the sufficiency of each framework condition for a given country, with a score of five representing "just sufficient". It should be noted, however, that, as the qualitative assessments are themselves context-dependent, cross-country comparisons of NES results should be interpreted cautiously. (In other words, national experts may have different views of sufficiency in various countries.)

In 2018, GEM introduced the National Entrepreneurship Context Index (NECI), to summarise the average state of an economy's environment for entrepreneurship. The NECI score is the arithmetic mean of that economy's EFCs scores, hence, it is measured on a Likert scale from 0 to 10. Figure 5.1 reports the NECI scores for 16 European countries for the years 2019-2020. The NECI score reveals that only a small set of countries met the sufficient threshold of 5 points. This includes Luxembourg, along with the Netherlands, Switzerland, Latvia, Norway, Germany and Sweden. This indicates the presence of some degree of heterogeneity in the quality of the environment for entrepreneurship. On average, the NECI scores did not reveal any substantial difference between 2019 and 2022, with very few countries exhibiting a clear drop (i.e. Spain, Switzerland).

Table 5.1: GEM's entrepreneurship context: Entrepreneurial Framework Conditions (EFCs)

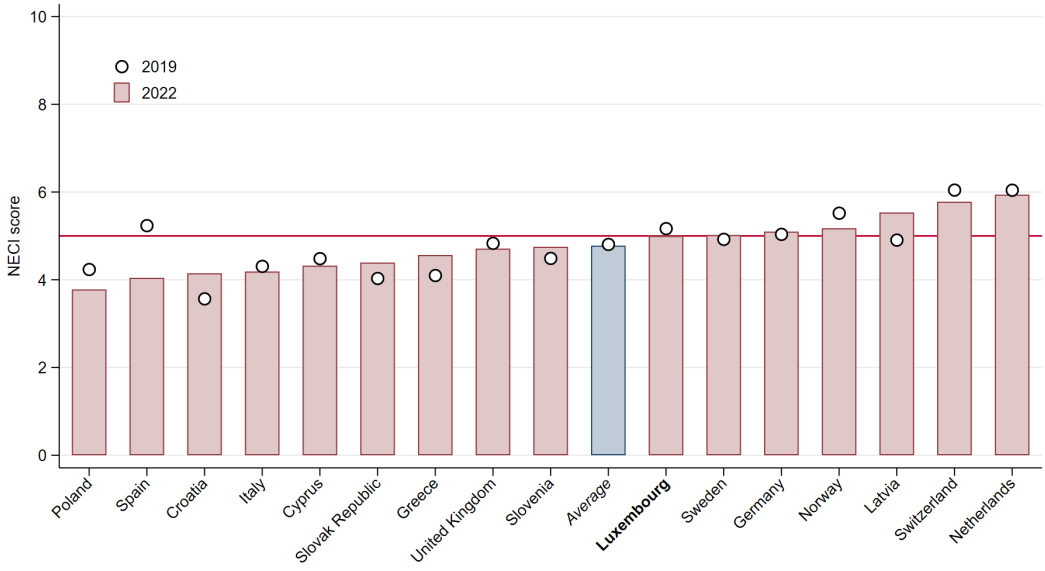
1.1	**Entrepreneurial Finance:** Sufficient funds are available to new start-ups, from informal investment and bank loans to government grants and venture capital
1.2	**Ease of Access to Entrepreneurial Finance** Funds are easy to access through bank loans, informal investment and and venture capital
2.1	**Government policy: support and relevance** Government policies promote entrepreneurship and support those starting a new business venture
2.2	**Government policy: taxes and bureaucracy** Business taxes and fees are affordable for the new enterprise. Rules and regulations are easy to manage, without undue burden on the new business.
3	**Government entrepreneurship programs** Quality support programs are available to the new entrepreneur at local, regional and national level
4.1	**Entrepreneurial education at school** School are introducing ideas of entrepreneurship and instilling students with entrepreneurial values such as enquiry, opportunity recognition and creativity
4.2	**Entrepreneurial education post-school** Colleges, universities and business schools offer effective courses in entrepreneurial subjects, alongside practical training in how to start a business
5.	**Research and development transfer** Research findings, including from universities and research centres, can readily be translated into commercial ventures
6.	**Commercial and professional infrastructure** There are sufficient affordable professional services such as lawyers and accountants to support the new venture, within a framework of property rights
7.1	**Ease of entry: market dynamics** There are free, open and growing markets where no large businesses control entry or prices
7.2	**Ease of entry: market burdens and regulations** Regulations facilitate, rather than restrict, entry
8.	**Physical infrastructure** Physical infrastructure (such as roads), Internet access and speed, the cost and availability of physical spaces is adequate and accessible to entrepreneurs
9	**Social and cultural norms** National culture encourages and celebrates entrepreneurship, including through the provision of role models and mentors, as well as social support for risk-taking

Source: 2013 – 2022 GEM Luxembourg and global APS data.

Figure 5.2 lists the scores obtained for the different components of the EFCs in Luxembourg, from highest (infrastructures) to lowest (internal markets), and compares them with the European average. The areas in which Luxembourg performed better than the average are a majority, and include government entrepreneurship programs and policies, R&D transfer, entrepreneurial education at school and taxes and bureaucracy. Conversely, the areas in which Luxembourg has scores below average are infrastructures, both physical and services (despite receiving the highest score in the country) and commercial and professional, and access to entrepreneurial finance. Overall, the scores assigned by the national experts in Luxembourg did not vary substantially in 2022 compared to those given in the past (GEM, 2018a).

In response to the pandemic, GEM introduced questions with the aim to understand the national experts' assessment of the reaction of government and entrepreneurs

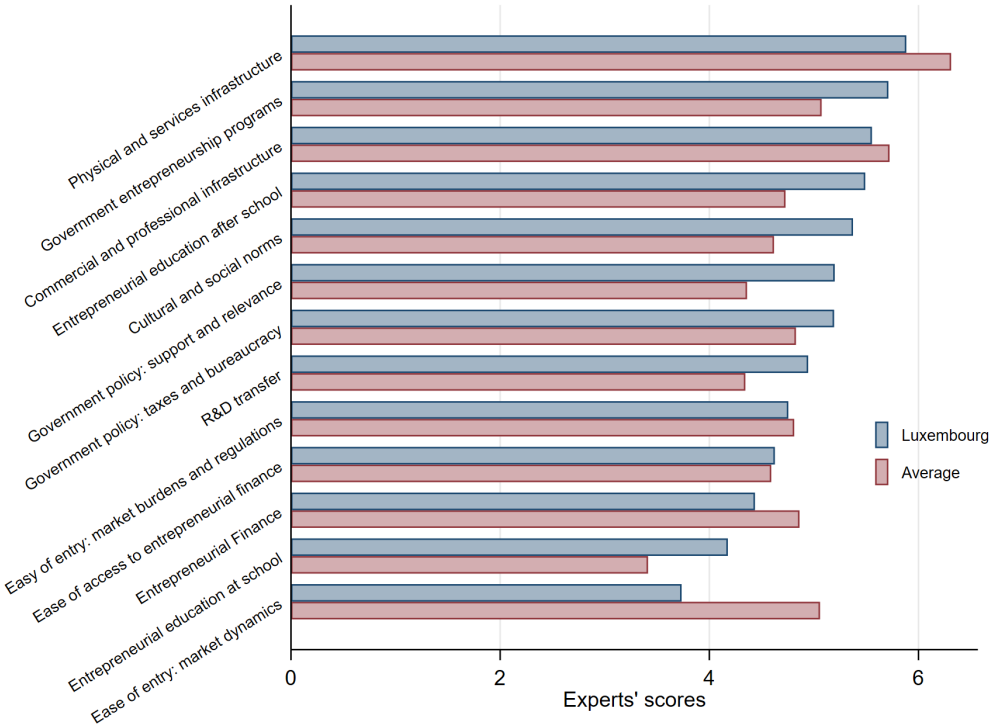
Figure 5.1: National Entrepreneurship Context Index.



Source: 2022 and 2019 GEM Global NES data.

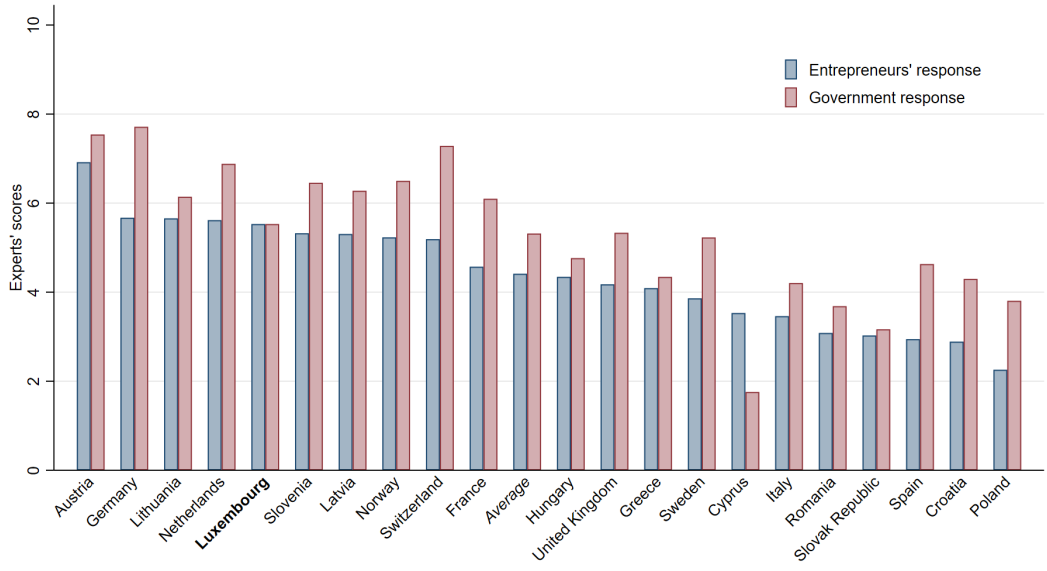
to the spread of COVID-19. Two new blocks of questions were introduced in NES in 2020. The first block of questions focused on whether entrepreneurs were introducing new ways of doing business, promoting working from home, adjusting their products and services, or identifying new opportunities. The second block, on government responses, asked whether governments policies and measures were effective in helping businesses to adjust, avoiding the loss of firms, protecting workers and customers, and whether governments were increasing digital delivery of regulations. Figure 5.3 shows results (6.5 vs 5.3). A majority of government responses are above sufficiency and in certain countries the experts' evaluation is especially high. In this latter group of countries, we find Luxembourg.

Figure 5.2: Experts' scores on Entrepreneurial Framework Conditions.



Source: 2022 and 2019 GEM Global NES data.

Figure 5.3: Experts' assessment of responses to the pandemic.



Source: 2022 GEM Global NES data.

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