

Global Entrepreneurship Monitor Luxembourg 2017/2018



Global Entrepreneurship Monitor
Luxembourg 2017/2018

This report was possible thanks to the generous support of:



COPYRIGHT © 2019 STATEC ISBN 978-2-87988-141-6 Published by the Institut national de la statistique et des études économiques du Grand-Duché du Luxembourg (STATEC), 13, rue Erasme, L-2013, Luxembourg. **AUTHORS:** Chiara Peroni (STATEC), Cesare A.F. Riillo (STATEC Research).

Please cite this work as follows: Peroni, C. and Riillo, C.A.F. (2019) *Global Entrepreneurship Monitor Luxembourg 2017/2018*. STATEC, Luxembourg.

Acknowledgements: Views and opinions expressed in this report are those of the author(s), and do not reflect those of STATEC and funding partners. The authors gratefully acknowledge the financial support of the Observatoire de la Compétitivité, Ministère de l'Economie, DG Compétitivité, Luxembourg, STATEC, the National Statistical Office of Luxembourg, the Ministry of the Economy, the Chamber of Commerce of the Grand Duchy of Luxembourg and the House of Entrepreneurship. The authors would like to thank 36 anonymous national experts for sharing their valuable knowledge on the Luxembourg entrepreneurial ecosystem. Thanks are due to Bruno Rodrigues, who prepared the codes and graphics while being employed at STATEC Research, and to Francesco Sarracino for the cover image. Thanks are also due to Charles-Henri DiMaria, Kelsey O'Connor, participants to STATEC's seminar series and colleagues at STATEC Research for useful comments. Authors are especially grateful to Laurent Solazzi, Luc Henzig, Guylaine Bouquet-Hanus for their support to this project.

Contents

1	Chapter 1: Introduction	8
2	Chapter 2: The GEM Research Project	9
2.1	The GEM conceptual model: taking context seriously!	10
2.2	Dynamic measures of entrepreneurship: When perceptions matter!	11
2.3	GEM surveys	12
2.3.1	Adult population survey (APS)	12
2.3.2	National experts survey (NES)	14
3	Chapter 3: Results from Adult Population Survey	15
3.1	Measuring entrepreneurship in Luxembourg over time	16
3.2	A profile of Luxembourg's entrepreneurs	19
3.3	New ventures: founders, size, activity, innovativeness and funding	24
3.3.1	Founders	24
3.3.2	Employment	25
3.3.3	Economic activity	27
3.3.4	Innovativeness	29
3.3.5	Funding	30
3.4	Entrepreneurship: a cross-country perspective	31
4	Chapter 4: Results from National Experts Survey	37
4.1	Barriers and enablers of entrepreneurship	39
5	Chapter 5: Special topics: policies, immigration and well-being	41
5.1	Policies	41
5.2	Immigration	44
5.3	Well-being	47
6	Chapter 6: Creative activities	51
7	Chapter 7: Conclusions	53
8	Annex: The characteristics of respondents	59

List of Figures

2.1	The GEM Conceptual Framework	11
2.2	The entrepreneurial process and GEM operational definitions	13
3.1	Total Early-Stage Entrepreneurial Activity (TEA) 2013-2017.	16
3.2	Entrepreneurship rates: all stages as <i>obstacle race</i> , 2013-2017. (Unit: percentage over total).	17
3.3	Total Early-Stage Entrepreneurial Activity (EEA) 2014-2017.	18
3.4	Potential entrepreneurs by gender, age and education level 2013-2017.	19
3.5	TEA entrepreneurs by gender, age and education level 2013-2017.	20
3.6	Established entrepreneurs by gender, age and education level 2013-2017.	21
3.7	Intrapreneurs by gender, age and education level 2013-2017.	21
3.8	Perceived entrepreneurial capabilities among the population in 2017: total and distributions.	22
3.9	Fear of failure among the population perceiving good opportunities to start a business in 2017: total and distributions.	23
3.10	Entrepreneurial motivations in 2017 (TEA): total and distributions.	24
3.11	Number of founders of TEA and Established businesses (2013-2017).	25
3.12	Employment of TEA ventures by size class (2017).	26
3.13	Employment of established ventures by size class (2017).	26
3.14	TEA by industry and entrepreneurs traits (2017).	28
3.15	Established by industry and entrepreneurs traits (2017).	28
3.16	Innovation of TEA and established (2013-2017).	29
3.17	Funding of start-ups in Luxembourg 2017.	30
3.18	TEA and opportunity driven TEA in the EU: country ranking (2017).	31
3.19	TEA by age and gender in Luxembourg and EU (2017).	32
3.20	Luxembourg and E.U. countries: Entrepreneurial intentions, skills and fear of failure in Luxembourg and EU (2017).	33
3.21	Societal perceptions of entrepreneurship In Luxembourg and EU (2017). (Unit: share of respondents in %.)	34
3.22	Entrepreneurial activities in Luxembourg and the EU (2017).	35
3.23	Entrepreneurial discontinuation in Luxembourg and the EU (2017).	36
4.1	Average expert scores for Luxembourg's EFCs (Likert scales of 9 points (1 = highly insufficient, 9 = highly sufficient), 2017	39
4.2	Assessment of barriers and enablers of Luxembourgish Entrepreneurial ecosystem by TEA status according to APS	40

LIST OF FIGURES

5.1	School trainings (2017). Note: entrepreneurs are: nascent, new and established entrepreneurs.	42
5.2	Training after leaving school (2017). Note: entrepreneurs are: nascent, new and established entrepreneurs.	43
5.3	Impact of government campaigns (2017). Note: entrepreneurs are: nascent, new and established entrepreneurs.	43
5.4	TEA rates by migration backgrounds (2013-2017).	45
5.5	Established business rates by immigration background (2013-2017).	45
5.6	Immigration background: Industry of TEA (2017) Note: Immigrants: First and second generation together	46
5.7	Immigration background: Industries in Established Businesses (2017) Note: Immigrants: First and second generation together	47
5.8	Subjective Well-Being by TEA (2013-2017).	48
5.9	Subjective well-being by gender (2013-2017).	49
5.10	Subjective well-being by age class (2013-2017).	50
6.1	Tinker in Luxembourg, 2017	52
6.2	Inventors in Luxembourg, 2017	52

List of Tables

4.1	The 9 GEM's Entrepreneurial Framework Conditions (EFC) that describe the entrepreneurial ecosystem	38
8.1	Unweighted distribution of respondents' traits	60

Executive summary

In recent years, governments have become increasingly active in designing policies to encourage and support entrepreneurial efforts. This is because entrepreneurship is widely recognised as a crucial source of job creation and economic growth. Moreover, theoretical and empirical studies have shown that entrepreneurship is an important contributor to innovation and technological progress, and a driver of productivity and ultimately of economic growth. In this context, the Global Entrepreneurship Monitor (GEM) initiative was launched to study entrepreneurship. GEM collects and analyses data to deepen the understanding of entrepreneurial activities and their link with countries' economic performances, to assess the evidence on links between entrepreneurship and growth, and to provide information needed to support policy actions. Data are collected on an annual basis and harmonised to enable international comparisons. The National Expert Survey collects experts' evaluations on the socio-economic context shaping entrepreneurship in the country. The Adult Population Survey provides information on the characteristics of individuals and their involvement in entrepreneurial activities over the different stages of venturing, from starting-up a business to running established firms. Barriers and enablers of the national entrepreneurial ecosystem, the link between policies and perception of entrepreneurship and creative activities are a special focus of this year's report. This GEM Luxembourg report 2017/2018 presents results from National Expert Survey and the Adult Population Survey collected in Luxembourg in 2017.

Main Results. The proportion of entrepreneurs relative to the total resident population in Luxembourg is high among European and innovation-driven countries. Early-stage entrepreneurial activity (TEA) is the key indicator produced by GEM and it measures the share of nascent entrepreneurs or new businesses' leaders in the country's adult population. Luxembourg's TEA, at 9.3 percent in 2017, shows an increasing trend since records began in 2013. The figure is also higher than the European average (8.3%).

Barriers and enablers. Both experts and the overall population regard infrastructure and governmental policies as the main strengths of the Luxembourg's system of entrepreneurship. In contrast, financing and resource availability — such as office space and qualified human resources — are perceived as the major barriers to entrepreneurship in Luxembourg.

Policies and entrepreneurship. GEM looked also at the impact of recently set up government schemes aimed at fostering entrepreneurship, both by raising public interest in entrepreneurial careers, and by providing training and funding to entrepreneurs. Were these policies effective? The initial evidence is encouraging. 13 percent of the whole population declared that their interest in entrepreneurship was increased by entrepreneurial policies. Training

programmes were popular among entrepreneurs, with one third of entrepreneurs declaring to have engaged in such training at secondary school, and nearly a half after leaving school. These figures were higher for entrepreneurs than for non-entrepreneurs, which suggests a positive *association* between entrepreneurial training and starting a new business.

Traits of entrepreneurs. Effective policies aiming to promote entrepreneurship require knowledge of motivations, fears and individual traits of entrepreneurs. The main traits of early stages entrepreneurs emerging from the GEM surveys are summarized and presented below:

Gender: In 2017, the share of early entrepreneurs among men (12.5%) was higher than the share of new entrepreneurs among women (5.9%). This difference is relatively stable over time.

Immigrant status: Immigration in the country is an important source of entrepreneurship. In particular, first generation immigrants (not born in Luxembourg) play a major role in entrepreneurial activity.

Mixed entrepreneurial motivations: Luxembourg entrepreneurs start new ventures to pursue business opportunities. However, necessity driven entrepreneurs are increasing over time. Opportunity driven entrepreneurship numbers are also high in a comparative perspective.

Satisfaction: In 2017, new entrepreneurs continue to report being more dissatisfied with their lives (14%) than other people (11%). However, these feelings of dissatisfaction decreased in 2017 compared to previous years. Notably, female entrepreneurs expressed higher satisfaction with their lives than previously reported.

Inventor/Bricoleur: The proportion of the population that spend leisure time to invent new items is more common among entrepreneurs (15%) than non-entrepreneurs (4%). Data show a positive association between inventive activities and starting a new business.

Early and small: 90% of new business (3-42 months) employ maximum 5 employees.

Chapter 1: Introduction

The Global Entrepreneurship Monitor (GEM) Luxembourg 2017/2018 is the 6th GEM country report to be released in Luxembourg. Since STATEC joined the GEM project in 2013, the GEM country report continues to provide unique information on entrepreneurial activities in Luxembourg. Over time, GEM Luxembourg has tracked entrepreneurship rates across the phases of the entrepreneurship process, reported on the motivations and individual traits of entrepreneurs and the attitudes of society towards entrepreneurial activities, and assessed their contribution to the overall economic environment. Moreover, GEM records have enabled researchers to establish links between entrepreneurship and the presence of migrants in Luxembourg, and to study well-being among entrepreneurs.

The GEM collects a rich dataset to deepen our understanding about entrepreneurship across time and countries. This report gives the main results from the 2017 waves of the GEM survey for Luxembourg and compares relevant aspects of entrepreneurship in Luxembourg. Chapter 2 presents the GEM framework of analysis, and describes features of the GEM dataset, which combine two surveys, namely the Adult population survey (APS) and the National Expert Survey (NES). Chapter 3 reports on entrepreneurial activities in Luxembourg from the 2017 wave of the APS, focusing on individual traits of entrepreneurs and characteristics of the new businesses, and tracks rates of entrepreneurship over time. Here, Luxembourg's results are compared to those for other EU countries. Chapter 4 presents NES results for the Luxembourg's institutional context, and barriers and enablers of the national entrepreneurial ecosystem. Chapter 5 reports on special topics of particular relevance to Luxembourg, namely immigration and subjective well-being. For the first time, GEM investigates creative activities, and the association between entrepreneurship policies and how entrepreneurship is perceived by Luxembourg's population. Chapter 7 summarises the results and concludes. The key findings of GEM Luxembourg 2017 are as follows:

- Luxembourg has high and stable over time rates of entrepreneurship;
- Infrastructure and favourable policies are the country's main strengths;
- Financing and resource availability are major barriers;
- Training programmes are popular among entrepreneurs;
- The typical entrepreneur starts new ventures to pursue a business opportunity;
- Men and immigrants are more likely to engage in entrepreneurship than women and non-immigrants; entrepreneurs are less satisfied with their lives than non-entrepreneurs;
- The majority of new ventures are small businesses - with 5 or fewer employees.

Chapter 2: The GEM Research Project

In recent years, governments have become increasingly active in encouraging and supporting entrepreneurship. Inter-governmental organisations have stepped up efforts on designing policies to foster entrepreneurship (e.g. OECD, 2017). This is because, since the seminal work of Schumpeter (1934), a growing body of empirical and theoretical evidence has shown that entrepreneurial activities are an important source of firms and job creation. Economists have also highlighted the links between entrepreneurship, innovation, and the diffusion of new technologies.

In this context, the Global Entrepreneurship Monitor (GEM) project was established in 1999 by academics at the London Business School (U.K.) and Babson College (U.S.) to study entrepreneurship, its outcomes and effects on economic development, and the conditions for thriving entrepreneurs. Based on surveys conducted by national teams in many countries world-wide, the consortium provides a harmonised dataset at annual frequency, which enables researchers and analysts to investigate entrepreneurial activities adopting a cross-national perspective. The main aims of these analysis are as follows: 1) provide basic indicators of entrepreneurship, comparable across countries and over time; 2) understand individual traits and motivations of entrepreneurs; 3) assess the attitudes of societies towards entrepreneurship; 4) identify factors which encourage or limit entrepreneurial activities; 5) derive policy implications, and assess policy effectiveness. The ultimate goal is to deepen the understanding of entrepreneurship and its link with countries' economic performance and growth.

Since its inception, the GEM project has grown from a consortium of ten participating countries to one involving more than 50 countries and a community of 400 researchers. GEM is now regarded as a prominent longitudinal study of entrepreneurship. In 2017, the consortium published its 19th annual report (GEM Global, 2018).

Luxembourg started participating in the project in 2013. Since then, the Adult Population Survey (APS) and the National Experts Survey (NES) have been administered to samples of the country's residents and panels of experts every year. This country report, the 6th to appear for Luxembourg, presents results from surveys administered during the summer of 2017. The APS was conducted on a sample of 2033 individuals, while the NES consisted of 36 interviews. The basic APS questionnaire is made up of a core questionnaire and special modules approved by the consortium on an annual basis. The 2017 special module investigates creative activities and inventiveness. In addition, the Luxembourg questionnaire includes country-specific questions on respondents' immigration background and well-being, the Luxembourg's ecosystem (e.g. barriers and enablers of entrepreneurship), and the influence of entrepreneurship policies on societal perceptions of entrepreneurs.

The remaining of this chapter describes in greater details the GEM conceptual framework and the two surveys included in the GEM dataset.

2.1 The GEM conceptual model: taking context seriously!

The GEM framework relies on two main ideas:

- entrepreneurship is better described as a “cycle” - *“from conception of entrepreneurial opportunities to its maturity or, alternatively to its demise”* (GEM Global, 2018, p. 21).
- entrepreneurial activities are shaped by the interactions of individuals with socio-cultural, economic and political context.

The GEM’s dataset collects observations on traits, attitudes and activities directly related to entrepreneurship. From these data, one can compute basic indicators of entrepreneurial activities, such as Total Early-stage Entrepreneurial Activity (TEA), the Social Entrepreneurial Activity (SEA) and the Employee Entrepreneurial Activity (EEA), which are available at the country level. The GEM framework views these indicators as resulting from the interaction between traits and characteristics of entrepreneurs and the overall “environment”. In turn, entrepreneurial outcomes affect firm and job creation, innovativeness, and ultimately economic growth. Such outcomes and effects can be quantified by resorting to data from official statistics or other surveys. One can see figure 2.1 for a depiction of the GEM framework.

The GEM framework describes the environmental context using two sets of measures at the national level:

1. The National framework conditions describe the social, cultural, political and economic context that impacts the advancement of societies as a whole. To describe the national frameworks, GEM adopts the World Economic Forum (World Economic Forum, 2017)’s twelve pillars of competitiveness. These are: institutions; infrastructure; macroeconomic stability; health and primary education; higher education and training; goods market efficiency; labour market efficiency; financial markets development; technological readiness; market size; business sophistication; innovation.
2. The Entrepreneurial Framework Conditions capture mainly policy and intangible and tangible capital endowments more directly related to entrepreneurship. This set of conditions includes: access to finance, entrepreneurship policies and programs; entrepreneurship education; research and development (R&D) transfer; commercial and legal infrastructure; internal market dynamics and entry regulation; physical infrastructure; cultural and social norms.

National and Entrepreneurial framework Conditions influence directly and indirectly the entrepreneurial activities and their outcomes. The indirect impacts are mediated by social attitudes towards entrepreneurship and individual characteristics of entrepreneurs. If society values entrepreneurship as a good career choice, if entrepreneurs have high societal status, and if media positively represents entrepreneurship, these views are likely to have a considerable impact on entrepreneurial activities. Individual attributes of people such as gender, age, self-perceptions (perceived capabilities, perceived opportunities, fear of failure), and those conditions that lead to the choice of starting a business (i.e., necessity- vs. opportunity-driven entrepreneurs) are also important drivers of entrepreneurship.

Overall, **the GEM model emphasises how the entrepreneurial process creates new jobs and value added, thus contributing to the socio-economic development.**

What's more, GEM unearths feedback effects between the socio-economic contexts, entrepreneurial activities, and their outcomes.

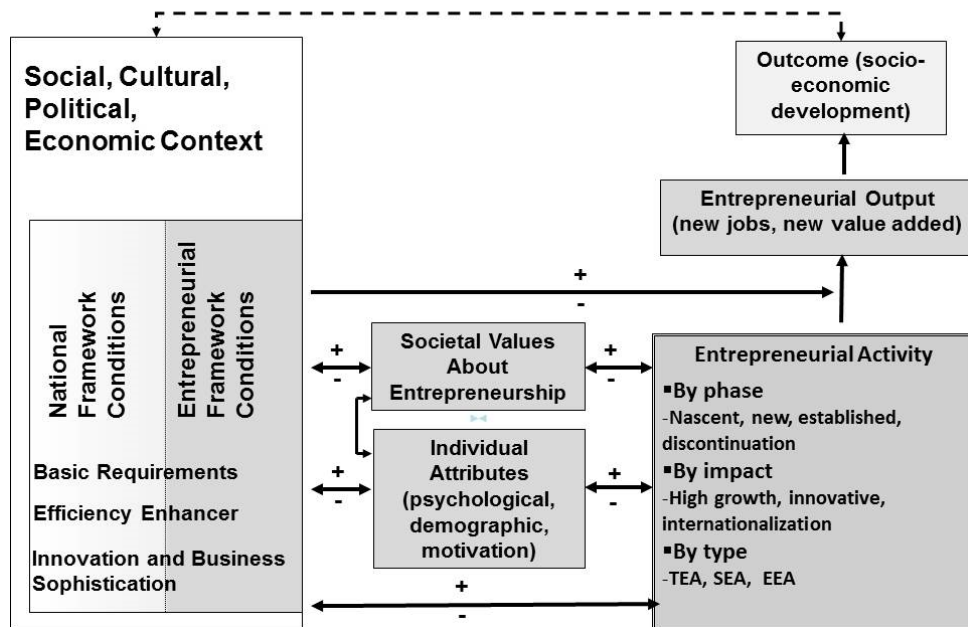


Figure 2.1: The GEM Conceptual Framework

2.2 Dynamic measures of entrepreneurship: When perceptions matter!

GEM regards entrepreneurship as a dynamic process. Figure 2.2 depicts the entrepreneurial process, and the corresponding operational definitions adopted by GEM for each phase of the process. The individuals at a particular stage of the entrepreneurial process are characterised as follows:

1. Potential entrepreneurs are those who plan to start a new business in the next three years;
2. Nascent entrepreneurs are those individuals involved in setting up a new business, and who have paid wages (to employers or to himself) for less than three months;
3. New entrepreneurs are owner-managers of firms that have paid wages for a period of time between 3 and 42 months;
4. Established entrepreneurs are owner-managers of firms that have paid wages for a period longer than 42 months.

GEM surveys are shaped by the GEM model, 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.

The most important indicator of entrepreneurship produced by GEM is TEA. TEA measures the share of respondents that are either nascent entrepreneurs or new businesses (stages 2 and 3). In other words, TEA reflects the level of entrepreneurial dynamism in a country and represents an overall entrepreneurship rate. Others indicators of entrepreneurship provide information on specific aspects of entrepreneurship. Among these, the Employee Entrepreneurial Activity (EEA) — also known as intrapreneurship — documents the proportion of employees within organizations who behave entrepreneurially. GEM collects information on individuals' entrepreneurial attitudes, activities and aspirations over all the phases of the entrepreneurship process. GEM seeks to "profile" potential entrepreneurs. People active at stages later than initial ones are interviewed about their motivations for starting a business. Perceptions and attitudes towards entrepreneurship are surveyed for the whole sample.

TEA measures the proportion of entrepreneurs in the population by implicitly assuming that the *quality* of all new ventures is the same. This is seldom the case: skills, motivation and expectations of a pizza maker are different from those of an IT start-up CEO. GEM makes an important distinction between *necessity-driven entrepreneurship* and *opportunity-driven entrepreneurship*. The first definition refers to individuals who are motivated primarily by a lack of other options for making a living, while the latter refers to those who are starting a business to take advantage of an opportunity. Opportunity-driven entrepreneurs are those individuals who wish to maintain or improve their income, or those who aim to increase their independence. Entrepreneurs can also be distinguished according to innovativeness, export orientation, and expected employment growth of their business.

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 (Driver et al., 2001).

2.3 GEM surveys

This section provides details concerning the surveys administered to Luxembourg's population.

2.3.1 Adult population survey (APS)

The APS is a survey addressed to the active population, that is, all people in a country who are between 18 and 65 years old. Each of the participating countries conducts the survey by interviewing a representative sample of at least 2000 individuals (2033 in Luxembourg). 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. Special modules were administered on immigrant entrepreneurs in 2012 (GEM Global, 2012), and on subjective well-being in 2013 (GEM Global,

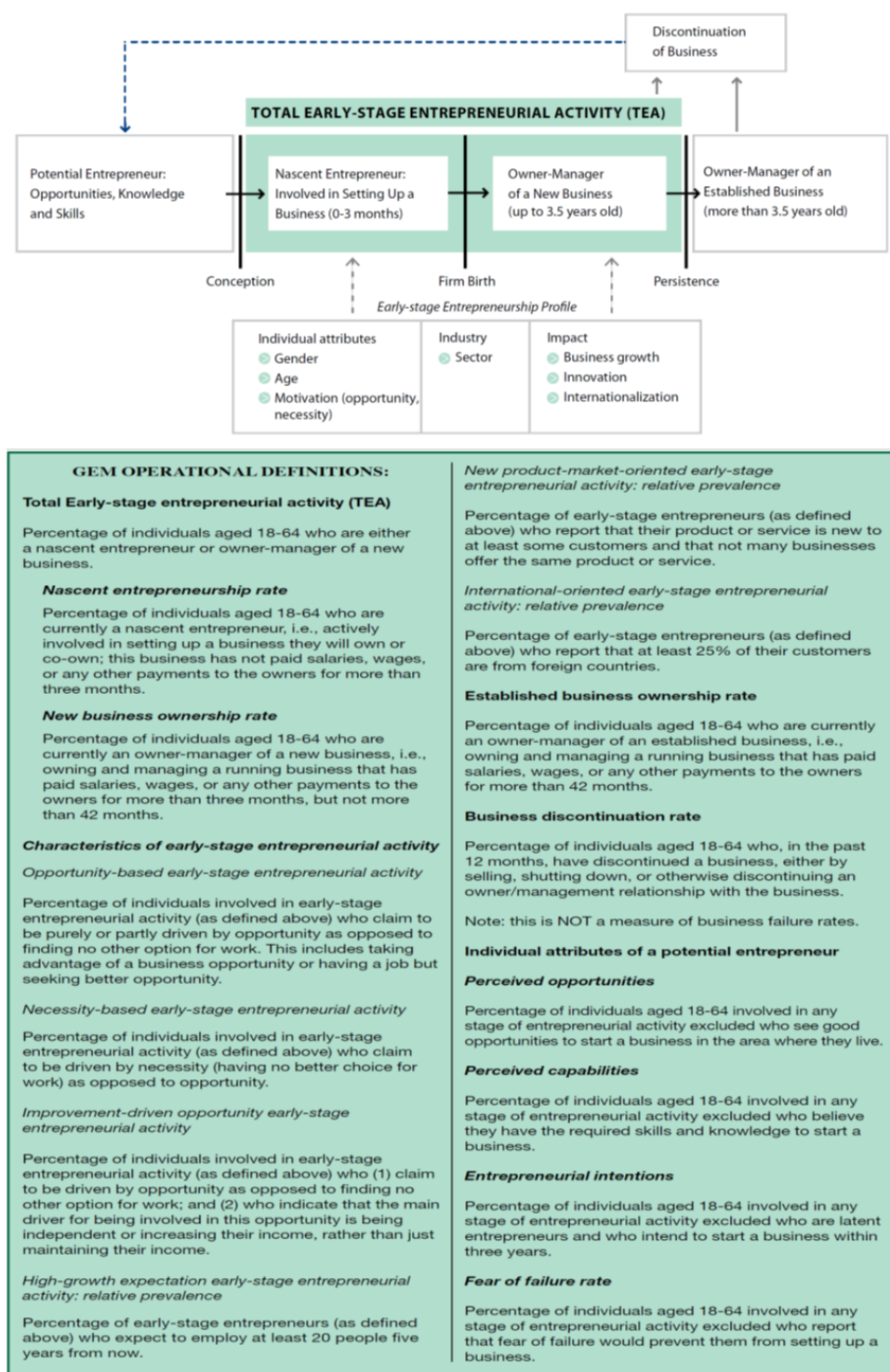


Figure 2.2: The entrepreneurial process and GEM operational definitions

2013a). Because of the relevance of these issues to Luxembourg, these modules have been included in the national questionnaire ever since. In 2017, other Luxembourg specific questions concern barriers and enablers, entrepreneurial policies, and creative activities in Luxembourg.

The questionnaire is made of eleven blocks of questions to collect information on the whole population and on different types of entrepreneurs. The blocks of questions collect data on the following topics:

1. Nascent entrepreneurs
2. Owner-managers
3. Potential and discontinuing entrepreneurs
4. Informal investors
5. Employment + entrepreneurial employee activity
6. Entrepreneurship policies (Luxembourg specific questions)
7. Barriers and enablers (Luxembourg specific questions)
8. Immigration (Luxembourg specific questions)
9. Well-being (Luxembourg specific questions)
10. Creative activities (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 and age 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 harmonised 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.

2.3.2 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 on the Entrepreneurial Framework Conditions that influence entrepreneurial activities. Four experts from each of the nine entrepreneurial framework condition categories are interviewed, summing up to a total of 36 experts per country. (The categories are listed in Table 4.1, in Section 4)

Chapter 3: Results from Luxembourg Adult Population Survey

This chapter reports on entrepreneurial activities in Luxembourg using information from the last wave of the APS. Previous waves are used for comparative purposes.

Section 3.1 presents measures of entrepreneurship in Luxembourg, focusing on the TEA and EEA indicator. Section 3.2 overviews the individual characteristics of entrepreneurs in Luxembourg. Section 3.3 analyses the characteristics of new ventures in Luxembourg. The section investigates ownership structure, types of activities in which new firms are created, ownership structure, and sources of funding for Luxembourgish start-ups. Finally, Section 3.4 compares Luxembourg data to those of other E.U. countries. Annex focuses on individual traits of respondents and compares characteristics of respondents with those of the overall resident population.

3.1 Measuring entrepreneurship in Luxembourg over time

Total Early Stage Entrepreneurship

TEA is the key indicator of entrepreneurship produced by GEM. TEA gives an overall rate of entrepreneurship comparable across States and over time. (TEA estimates the percentage of adult population that are setting up or running a business up to 3.5 years.) Figure 3.1 shows that in 2017 TEA was just over 9 percent in Luxembourg, slightly down from the two previous years, but higher than in 2013 and – statistically higher than – 2014.¹ Note that the average TEA rate in Europe was about 8 percent (GEM Global, 2018). **Results suggest that TEA in Luxembourg is stable around 9%.**

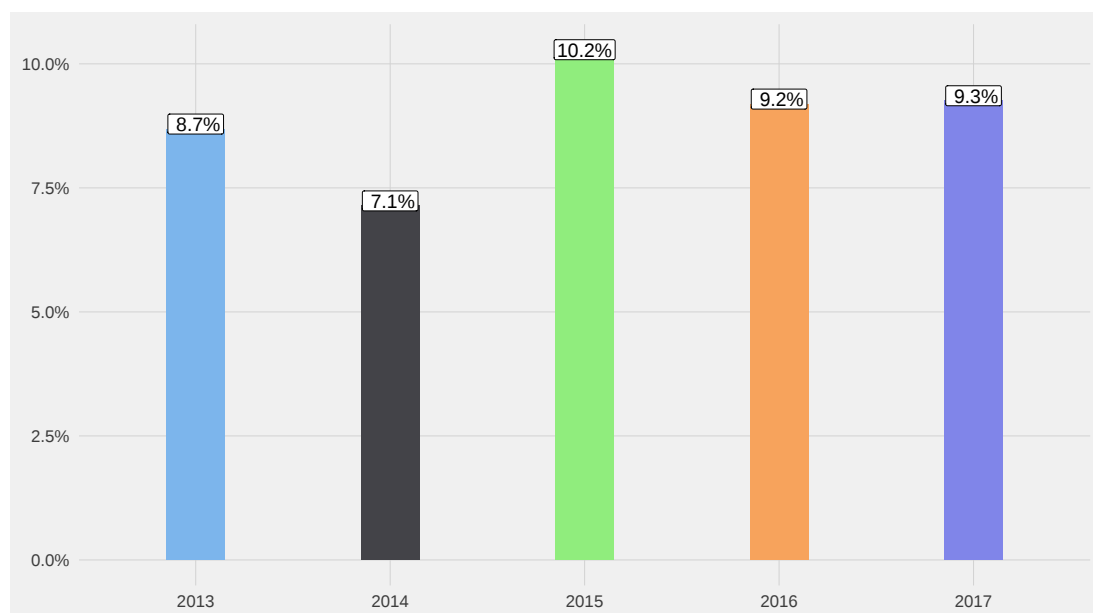


Figure 3.1: Total Early-Stage Entrepreneurial Activity (TEA) 2013-2017.

Entrepreneurial process

While TEA offers an indicator of entrepreneurial activity focusing on creation of new ventures, GEM emphasises that entrepreneurship is a *process* (e.g. van der Zwan et al., 2010). Below we briefly recall the status of entrepreneurs at each stage of the entrepreneurial process (see also Chapter 2):

1. Inactive;
2. Potential (expecting to start a new business within the next three years);
3. Nascent entrepreneur (involved in setting up a business);

¹Tests of statistical significance tell us whether we should interpret the differences in yearly records as systematic - true in the statistical sense - or "random". The only significant differences are found in TEA between 2017 and 2014.

4. New entrepreneur (owner-manager of firm younger than 42 months that pays wages during last three months);
5. Established entrepreneur (owner-manager of firm older than 42 months that pays wages during last three months).

As in an obstacle race, each entrepreneur passes through intermediate steps. At each stage, the entrepreneur can exit or proceed to the next stage of the process. Comparing TEA and the various entrepreneurship stages, one can see that TEA combines nascent entrepreneurship (the stage of setting up a new firm) and new entrepreneurship (the stage of owning-managing a new firm for up to 3.5 years). Figure 3.2 shows entrepreneurship rates in Luxembourg, from entrepreneurial intentions to established businesses over the total population (in percentage). One can see that, in 2017, nearly 21% of respondents declared themselves as potential entrepreneurs or already engaged in some form of entrepreneurial activity, 12% had engaged in some form of entrepreneurial activity (nascent, new or established), 6% were new entrepreneurs and about 3% ran established businesses.² These figures are similar to those for previous years, with the exception of potential entrepreneurs, whose number was significantly lower in 2017 than in previous years. **Statistical tests indicate that there are no statistically significant differences in entrepreneurship rates over the years in Luxembourg.**

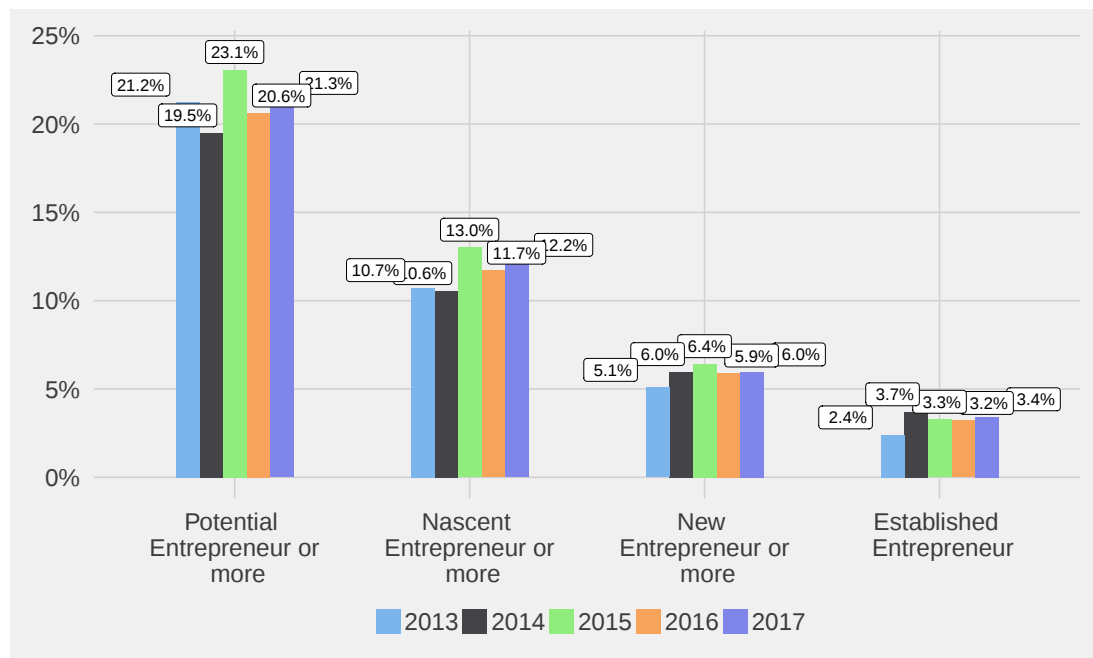


Figure 3.2: Entrepreneurship rates: all stages as *obstacle race*, 2013-2017. (Unit: percentage over total).

²Reading 3.2 from left to right, the percentage reported at each stage encompasses the percentages reported at the following stages. For example, "potential entrepreneurs or more" (21%) is the sum of 12% that are "nascent or more" (already engaged in some form of entrepreneurial activity) plus the 9% that expect to start a business. When looking at categories of engaged entrepreneurs, it is important to note that categories are not mutually exclusive. Certain individuals may be engaged in different phases of entrepreneurship at the same time.

Entrepreneurial Employee Activity

Traditionally, GEM has identified early entrepreneurship with the creation of start-ups (i.e. newly registered businesses). Recently, GEM has broadened this definition by also considering the entrepreneurial activities/behaviour of employees within organizations (GEM Global, 2013b). This type of entrepreneurship is known as entrepreneurial activities (Antoncic and Hisrich, 2001) — entrepreneurship within existing organizations — and is captured in GEM by the Entrepreneurial Employee Activity (EEA). EEA is defined as the percentage of individuals who are involved in entrepreneurial activities for their employees — such as setting up a business unit, a plant, a subsidiary, or developing new goods and services.

Figure 3.3 documents EEA in Luxembourg. (Data are available over the period 2014–2017.) One can see that about 7% of respondents are setting up a new business as part of their normal work as employees. This compares to a European average of 4.4 %; in neighbouring countries, such as Germany and France, EEA was, respectively, 5.7% and 3.9%. Notably, GEM Global (2018) found that EEA was as high as 5.5% in innovation driven economies, which suggests a link between firms’ and economies’ abilities to innovate. The EEA fluctuates around 7% in the period 2014-2017. If we define the sum of EEA (7.2%) and TEA (9.3%) as the *Gross Entrepreneurial Behaviour*, we can conclude that **in 2017 nearly 40% of the Gross Entrepreneurial Behaviour in Luxembourg is taking place in established firms**. Reading figures 3.3 and 3.1 together this pattern appears to be stable over time.

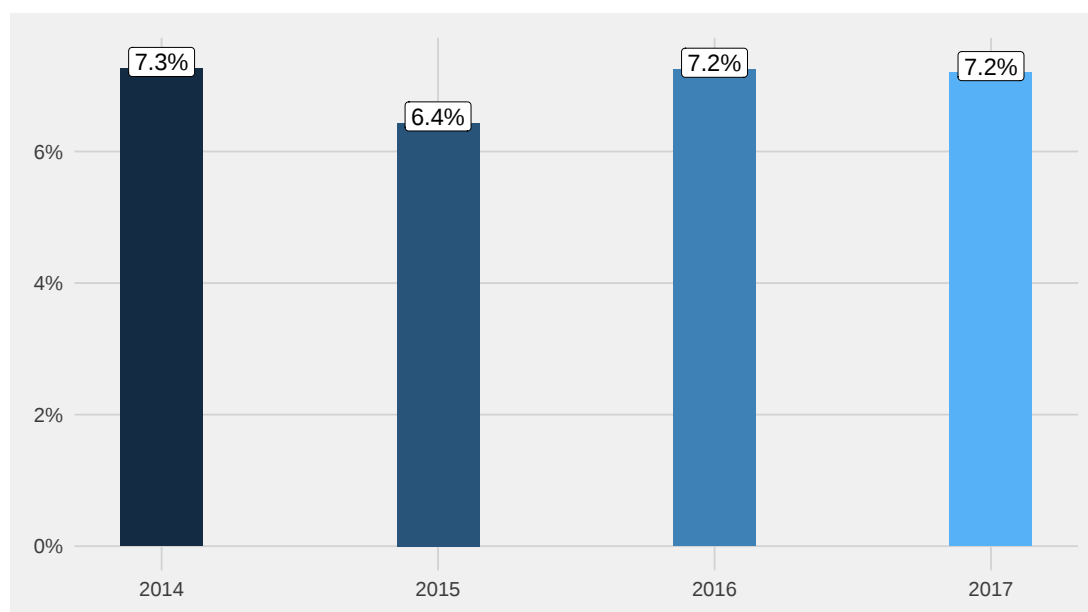


Figure 3.3: Total Early-Stage Entrepreneurial Activity (EEA) 2014-2017.

3.2 A profile of Luxembourg's entrepreneurs

This section presents a “profile” of Luxembourg's entrepreneurs, focusing on their characteristics at nascent, TEA and established stages of the entrepreneurial process. This information helps to identify individuals who are most likely to become successful entrepreneurs, but also highlights gaps and “missed opportunities”.

Potential entrepreneurs

Figure 3.4 presents the proportion of the population that are potential entrepreneurs (individuals that intend to start a business within 3 years), disaggregated by gender, age, education level.³ This data suggests the existence of an “entrepreneurship intentions” gap along these three dimensions which persists over time. Men 18-34 year olds and with better education are more likely to declare themselves as potential entrepreneurs. In 2017, 20% of male respondents declared that they intended to start a business compared to the 16% of women; 26% of 18-34 year olds compared to 8% 55-64 year olds. Among better educated individuals 22% expect to start a business compared to 16% among less educated individuals.

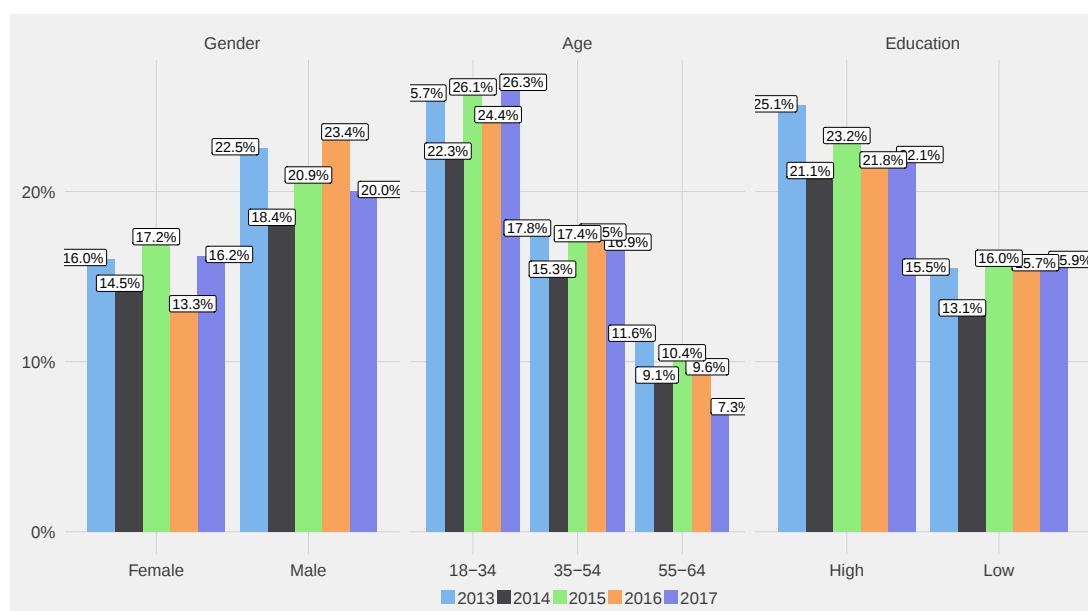


Figure 3.4: Potential entrepreneurs by gender, age and education level 2013-2017.

TEA

Figure 3.5 shows the distribution of TEA entrepreneurs by gender age and education. The data suggests the existence of an entrepreneurship gap along these three dimensions which persists over time. Indeed, 18-34 year old men with better education are more likely to declare themselves as TEA entrepreneurs. For example, in 2017, 12.5% of male respondents are setting up or running a business (up to 3.5 years) compared to the 5.9% of women; 11.9% of 18-34

³The High Education category includes individuals that successfully concluded short-cycle tertiary education, bachelor, master or doctoral studies defined according to the ISCED codes (UNESCO, 2011). The low education category includes primary, and secondary education

year old respondents are potential entrepreneurs compared to 4.3% 55-64 year olds. Among better educated individuals, 14.5% respond as TEA entrepreneurs compared to 6.2% among less educated individuals.

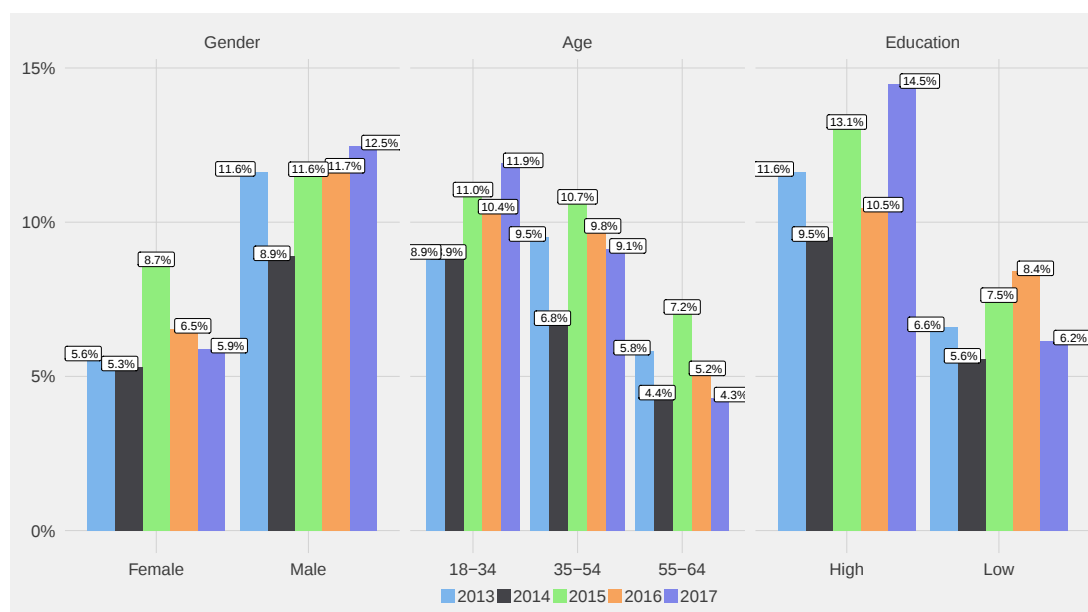


Figure 3.5: TEA entrepreneurs by gender, age and education level 2013-2017.

Established

Figure 3.6 reports the distribution of established entrepreneurs by gender, age, and education . While previous figures show higher entrepreneurship rates for men than women, figure 3.6 suggest that the gender gap is less strong among established entrepreneurs (more than 42 months). In the period 2013-2016, there are more male established entrepreneurs than women, but in 2017, there are slightly more women (3.7%) than men (3.2%). Given the relative low sample size, these proportion are not statistically different. While potential and TEA entrepreneurs are more common among the younger population, established entrepreneurs are consistently more common among older people. In 2017, 2% of the 18-34 year olds compared to 4.6% of 35-54 year olds and 3.5% of 55-64 year old people. In terms of education, we note that the education gap remains at all stages of entrepreneurship and it is persistent over time. In 2017, among better educated individuals, 6.4% are established entrepreneurs compared to 2.4% among less educated individuals.

EEA

Finally, Figure 3.7 reports the distribution of EEA by gender, age, and education. *The data show that the gaps identified in TEA measures of entrepreneurship are consistent with the gaps in EEA measures.* In 2017, EEA entrepreneurs are more common among men (10%) than women (4%); among 35-54 year olds compared with other age groups (10% compared to 6% of 18-34 and 4% of 55-64 year olds) and among better educated individuals (13% compared to 4% of less educated individuals). Similar patterns also occur in previous years, confirming the persistence of the entrepreneurship gaps over time.

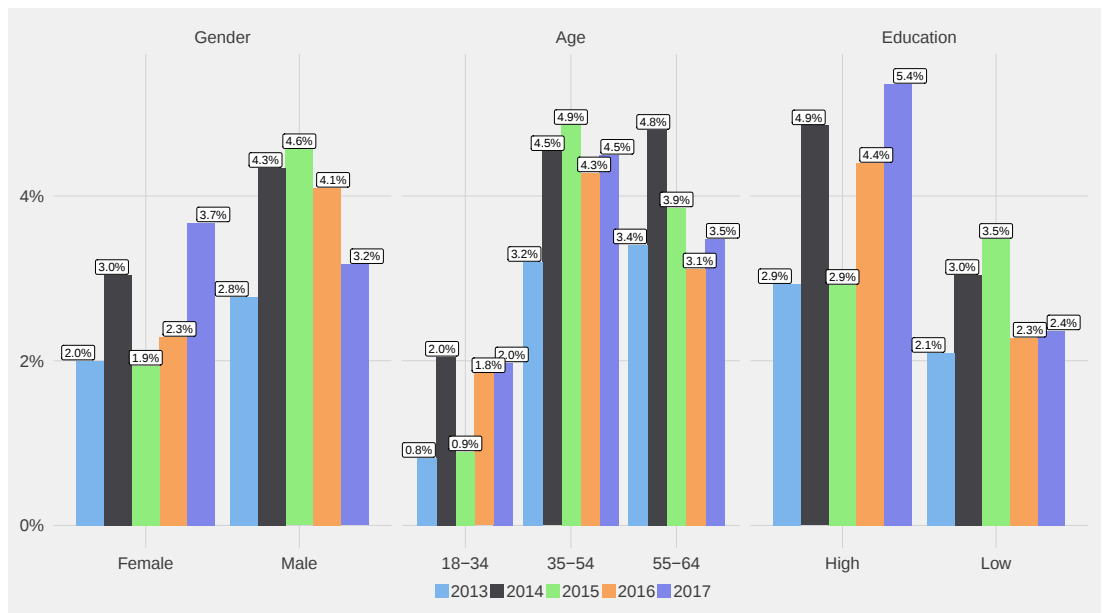


Figure 3.6: Established entrepreneurs by gender, age and education level 2013-2017.

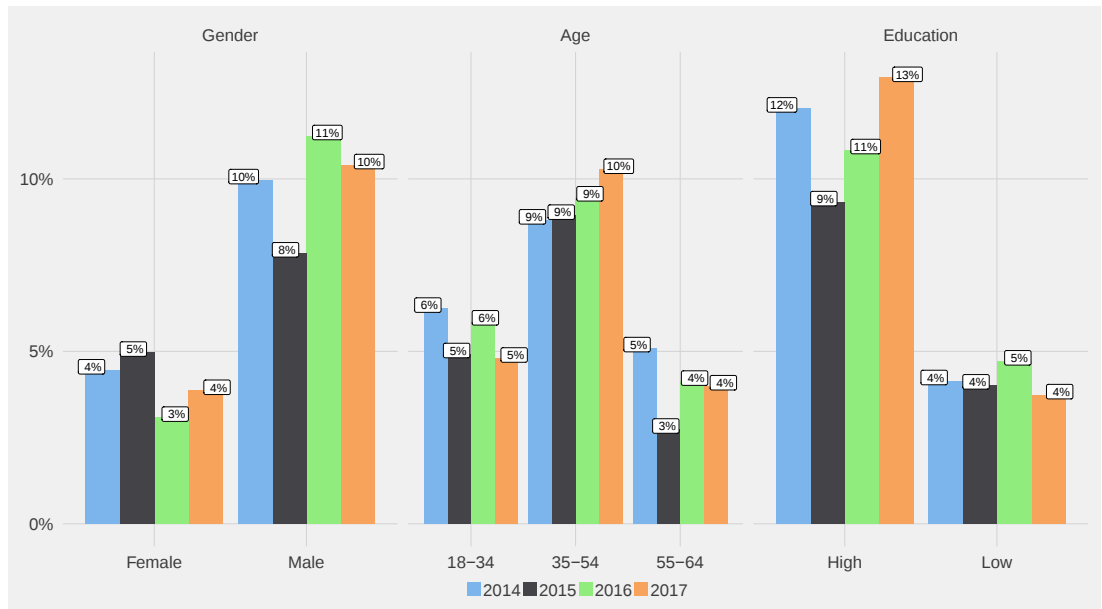


Figure 3.7: Intrapreneurs by gender, age and education level 2013-2017.

Individual attributes and entrepreneurs' motivations

Self-perceptions and motivations are considered important drivers of entrepreneurship that can influence the development of entrepreneurial behaviour (e.g. Boyd and Vozikis, 1994). Several APS questions are designed to investigate the perceived entrepreneurship capabilities of population and the motivations of entrepreneurs. Figure 3.8 reports the perceived capabilities of the population defined as the percentage of respondents who believe they have the required skills and knowledge to start a business. **41% of total population believe they have the necessary skills to start a business** compared to the 43% in Europe (GEM Global, 2018, p. 105). Figure 3.8 shows also that the proportion of people perceiving themselves as skilled is higher among men (50%) and people with better education (50%) than among women (30%) and lower-educated people (33%). Perceived capabilities do not vary considerably across age or income.

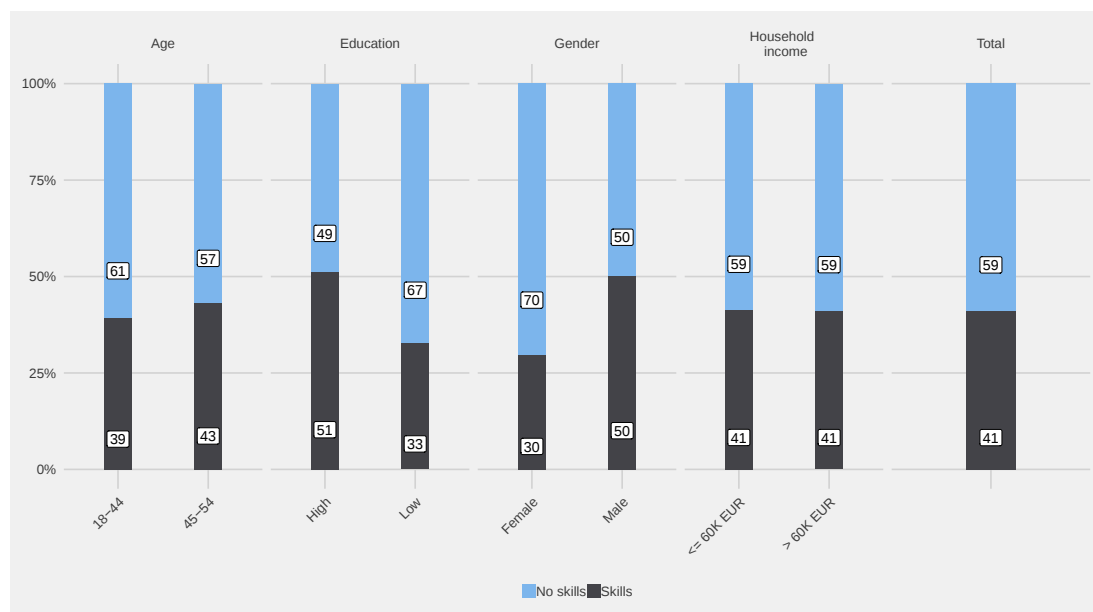


Figure 3.8: Perceived entrepreneurial capabilities among the population in 2017: total and distributions.

Having the capabilities for starting a business may not be enough to start-up as an entrepreneur, because fear of failing may stop potential entrepreneurs from pursuing business ventures. Indeed, literature and policy makers often regard the fear of failing as a strong barrier to entrepreneurial action, especially relating to concerns of expensive insolvency procedures and social stigma (Cacciotti and Hayton, 2015). The European commission has proposed to modernise the EU's insolvency rules to offer a *second chance* for entrepreneurs (The European Commission, 2012).

Figure 3.9 shows the proportion of people perceiving good opportunities to start a business, that indicates fear of failure would prevent them from starting a business. **53% of people perceiving good opportunities to start a business report that fear of failure prevents them from starting a business** compared to 37% of Europe (GEM Global, 2018, p. 105).⁴

⁴2018 figures differ slightly from figures reported in GEM Global report (GEM Global, 2018) because we implemented more sophisticated weighting scheme (see Annex for more details).

Figure 3.9 also shows the distribution of fear of failure across age, gender, education and income. Fear of failure is more common among women (61%) than men (45%) and among people with lower education (55%) than high educated people (47%). The distribution of fear of failure among age groups and income do not change considerably.

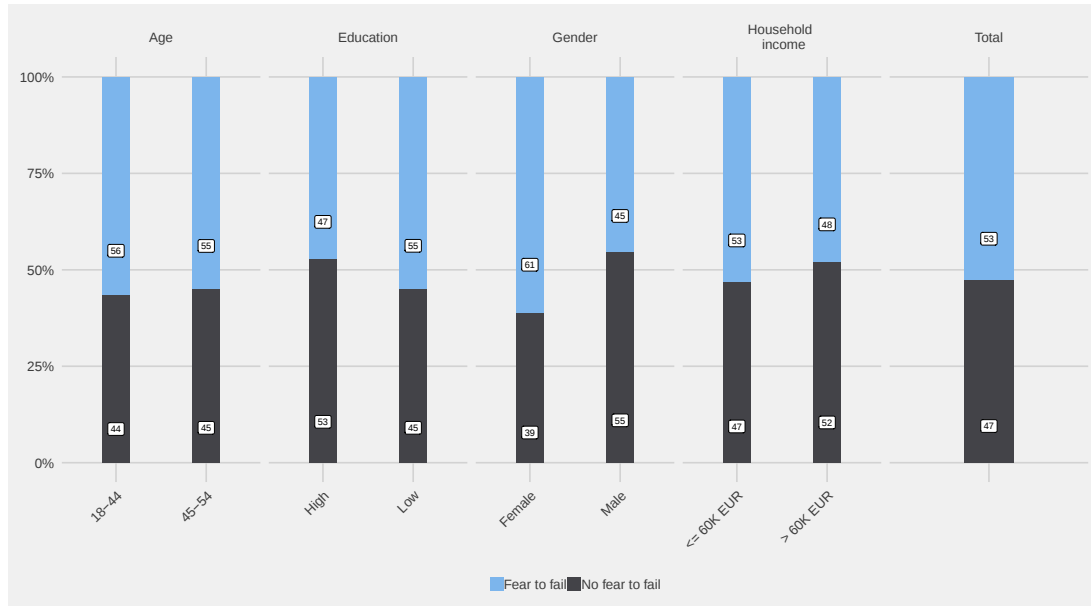


Figure 3.9: Fear of failure among the population perceiving good opportunities to start a business in 2017: total and distributions.

Individual attributes and perceptions are driving not only the setting up of new ventures but also the success following a new enterprise. GEM distinguishes between entrepreneurs that are motivated by a lack of other options for making a living (necessity-driven entrepreneurship) and those who start a business to take advantage of an opportunity (opportunity-driven entrepreneurship). This distinction is relevant because motivations may have a substantial impact on individuals' earnings and outcomes (e.g. Fossen and Büttner, 2013).

Figure 3.10 presents entrepreneurs motivations by broad classes of age, gender, education and income. One can see a clear prevalence of opportunity-driven TEA entrepreneurs. Nearly 80% of all TEA entrepreneurs stated that their entrepreneurial motivations were fully or partly driven by pursuing an opportunity compared to 75.4 % of other countries (GEM Global, 2018, p. 113). In 2017, 19% of entrepreneurs declared to be driven by necessity, in line with the 19.7% in other European countries (GEM Global, 2018, p. 113) but higher than in 2016 (10%) (GEM Luxembourg , 2017, p. 23).⁵ One can also see that motivations differ across population groups: opportunity-driven entrepreneurs are more likely to be men and individuals with better education. Income seems to play a minor role in the motivations of entrepreneurs. The share of respondents involved in TEA because of necessity is 24% for those reporting lower income, compared to 21% for those with higher income. (The sample median income is 60 000 €).

Most entrepreneurs in Luxembourg are opportunity motivated.

⁵Percentage of necessity driven entrepreneurship in Luxembourg reported here for 2017 (19%) differ from the one reported in (GEM Global, 2018) (13.5%) because a more accurate weighting scheme is used in the present analysis.

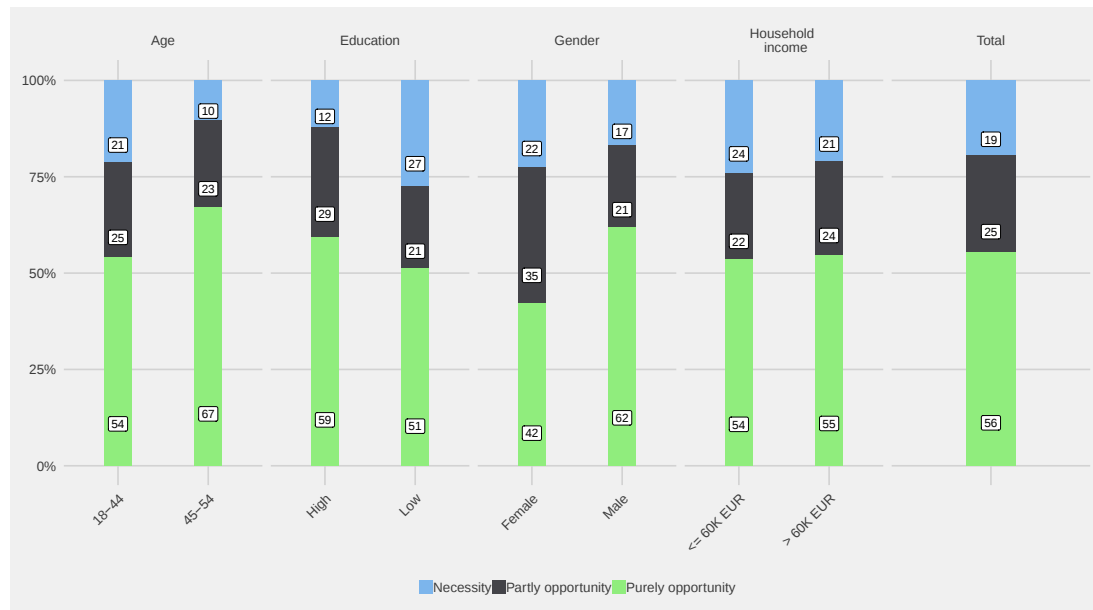


Figure 3.10: Entrepreneurial motivations in 2017 (TEA): total and distributions.

3.3 New ventures: founders, size, activity, innovativeness and funding

This section reports on the characteristics of the businesses established and managed by the entrepreneurs. What follows describes the ventures' ownership structure, their distribution across industries, their innovativeness and the sources of funding of new firms. As such, these results focus on TEA and later phases of entrepreneurship.

3.3.1 Founders

Entrepreneurs' knowledge and skills (e.g. managerial, technical) affect the survival and growth rates of new firms. A joint venture of several entrepreneurs can make it easier for businesses to gather the variety of skills needed to successfully set up and run the venture. Moreover, many founders can more easily collect the capital needed to start a new business. However, among several owners, there might be risk of conflicts and disagreements. This can slow down the decision-making process, and ultimately limit the growth of the start-ups. Previous studies regard the number of founders as a proxy of the availability of internal finance or human capital and find mixed evidence. While some works detect a positive association between the number of founders and growth (Cooper and Bruno, 1977; Colombo and Grilli, 2005, 2010; Ughetto, 2016), other studies do not find any significant correlation (Westhead and Cowling, 1995; Almus and Nerlinger, 1999). Figure 3.11 presents the number of entrepreneurs involved in running and managing the ventures — for TEA and established businesses over the period 2013-2017. One observes that most businesses have a sole founder, and that this observation is relatively stable over time. (In 2017, the proportion of sole owners was 65% for established businesses, up from previous years, and about 50% for TEA businesses.) **The majority of both new and established firms are owned by sole proprietors.** While sole entrepreneurs might be regarded as self-employed people, these results suggest that entrepreneurship is not fully

captured by self-employment. Nearly half of new and established businesses are run by more than one entrepreneurs.

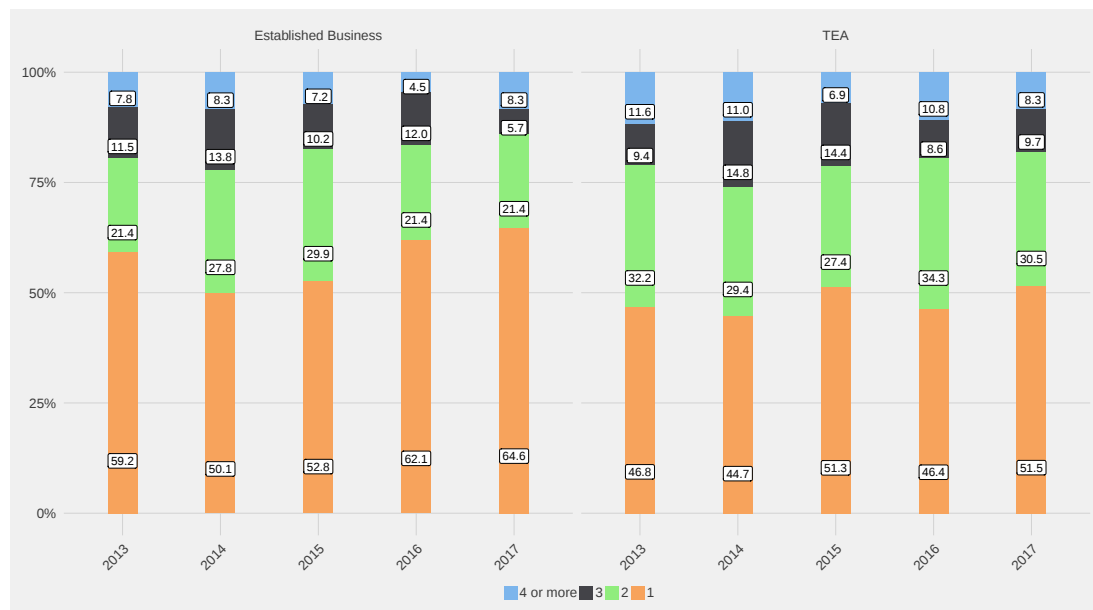


Figure 3.11: Number of founders of TEA and Established businesses (2013-2017).

3.3.2 Employment

New businesses are considered to be an important source of new jobs. Figure 3.12 shows the number of employees in TEA businesses (new firms of age 3-42 months) in total and by age, gender, education and income of the entrepreneurs. 90% of TEA business have less of 6 employees (nearly 30% have no employees). Better educated entrepreneurs are likely to have more employees (14% of better educated entrepreneurs hire more than 5 employees compared to 8% of lower-educated entrepreneurs). Looking at gender, we observe that male entrepreneurs have greater chances of employing more employees (14% of male employees hire 5 employees or more compared to 9% of female entrepreneurs). Employing many employees does not necessarily increase household income. Indeed, 16% of entrepreneurs with household income of less than 60 000 € employ 5 employees or more compared to 8% of entrepreneurs with more than 60 000 € of income.

Figure 3.12 shows the number employees of TEA entrepreneurs, Figure 3.13 shows the employment of established entrepreneurs. Over all, Figure 3.13 shows that established entrepreneurs hire more employees than TEA (nearly 18% hire 5 employees or more compared to 11% of TEA). **Male, older, better educated and higher income established entrepreneurs are associated with higher employment levels.** 29% of male established entrepreneurs employ more than 5 employees compared to 7% of women; 28% of older established entrepreneurs employ more than 5 employees compared to 10% of younger entrepreneurs. 27% of better educated entrepreneurs have no employees compared to 43% of lower-educated. Established entrepreneurs with more employees have higher income (24% of established entrepreneurship hire more than 5 employees compared to 7% of entrepreneurship with less than 60 000 € income).

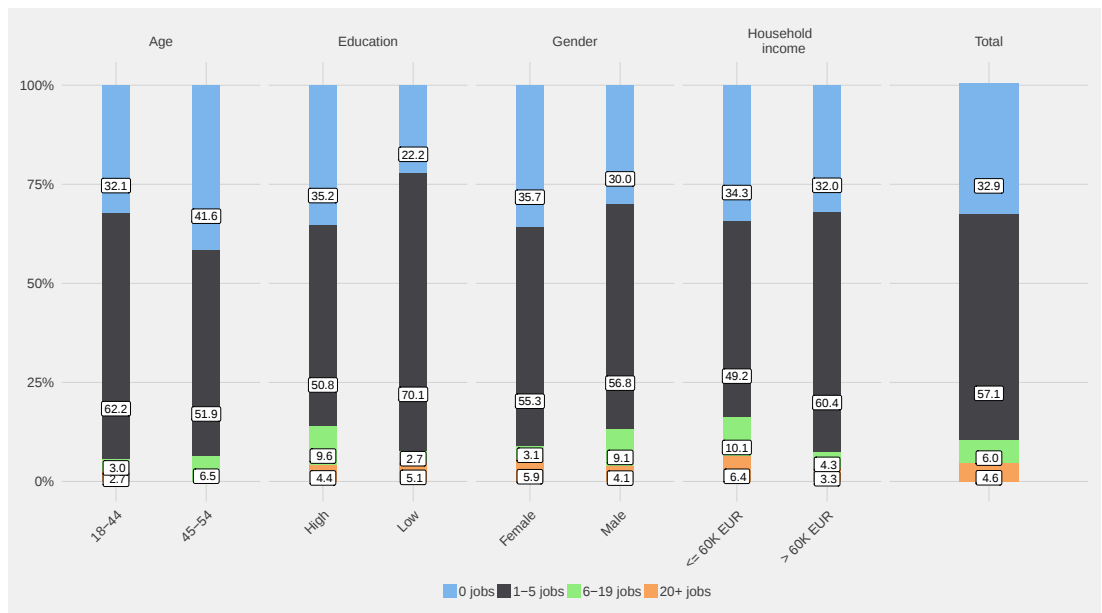


Figure 3.12: Employment of TEA ventures by size class (2017).

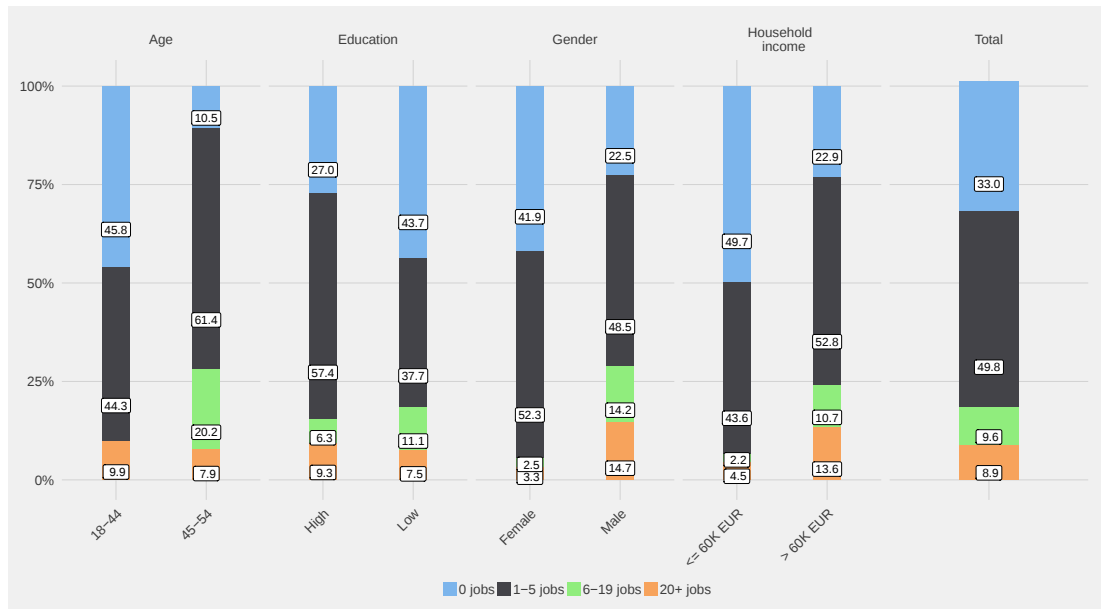


Figure 3.13: Employment of established ventures by size class (2017).

3.3.3 Economic activity

This section reports on entrepreneurs' participation in various economic activities. This is relevant because it helps to characterise entrepreneurial activity and its contribution to the economy. Indeed, entrepreneurship matters to industries' outcomes, and, in turn, certain industries offer more business opportunities than others. New businesses' creation and survival rates vary considerably across industries. Moreover, some industries show degrees of specialization in terms of gender or skills. As an example, the majority of workers and entrepreneurs in construction are men and ventures in biotechnology typically require specialized skills and high education.

To explore industry patterns of entrepreneurship, the following illustrates the distribution of TEA by personal characteristics of entrepreneurs across economic activities. The latter are defined according to the International Standard Industrial Classification of All Economic Activities (ISIC Rev.4). The classification in this report is the following:

- Transforming industries: agriculture & forestry, fishing, mining, manufacturing, utilities, transport, storage, wholesale trade, and construction.
- Consumer oriented industries: retail trade, hotels & restaurants and other consumer services.
- Health, education and other services: health, education and social services.
- Business services: information and communication, financial intermediation, real estate activities, professional services and administrative services.

Figure 3.14 shows that **TEA entrepreneurs are mostly active in the business services industry** (34% of new ventures), followed by transforming (27%). Other noticeable data features are as follows. Firstly, the gender breakdown shows that **male entrepreneurs are mainly active in transforming industries and business services, while women are more active in education, health and other services**. Secondly, entrepreneurs with better education are more likely to start a venture in the business services. Finally, lower income and older entrepreneurs are more likely to engage in consumer oriented businesses.

Figure 3.15 shows that **established entrepreneurs are mostly active in the business services industry** (34% of established ventures), followed by education (24%). Other noticeable data features are as follows. Firstly, the gender breakdown shows that **established male entrepreneurs are mainly active in business services, while women are more active in education, health and other services**. Secondly, entrepreneurs with better education are more likely to manage an established venture in business services while lower-educated entrepreneurs are more engaged in education industry (51%). Finally, lower income entrepreneurs are more likely to engage in education businesses (43% compared to 7% of lower income entrepreneurs).

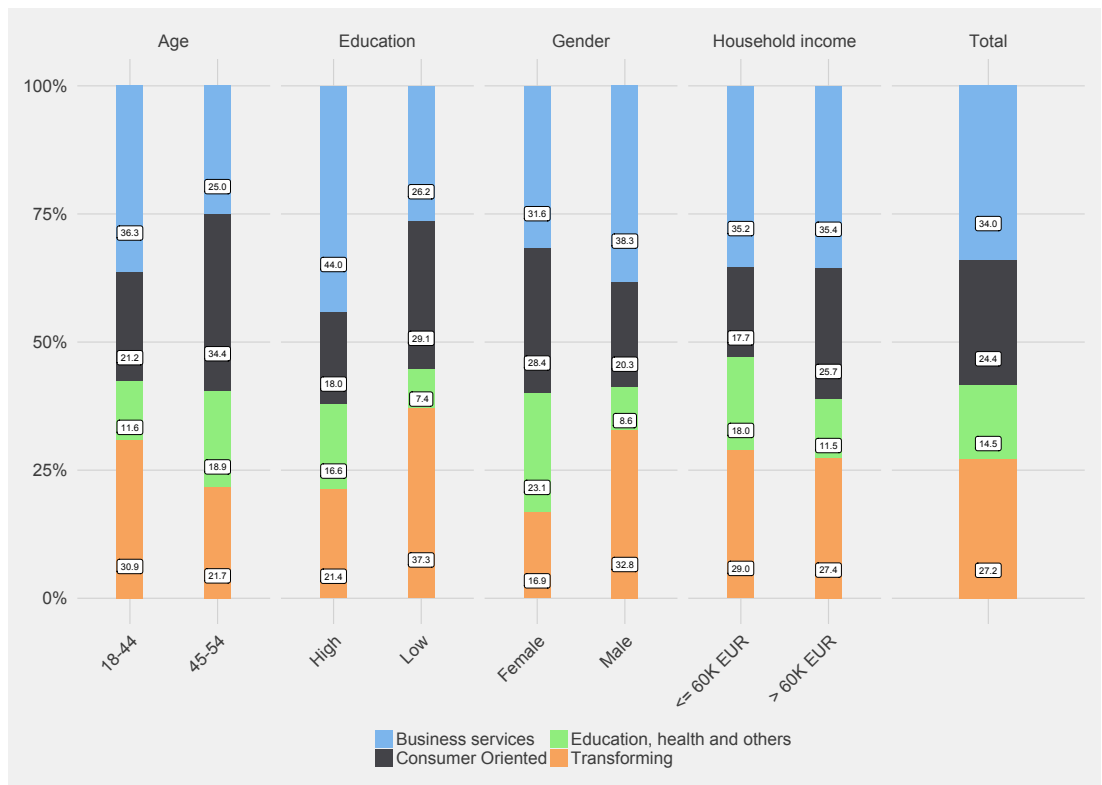


Figure 3.14: TEA by industry and entrepreneurs traits (2017).

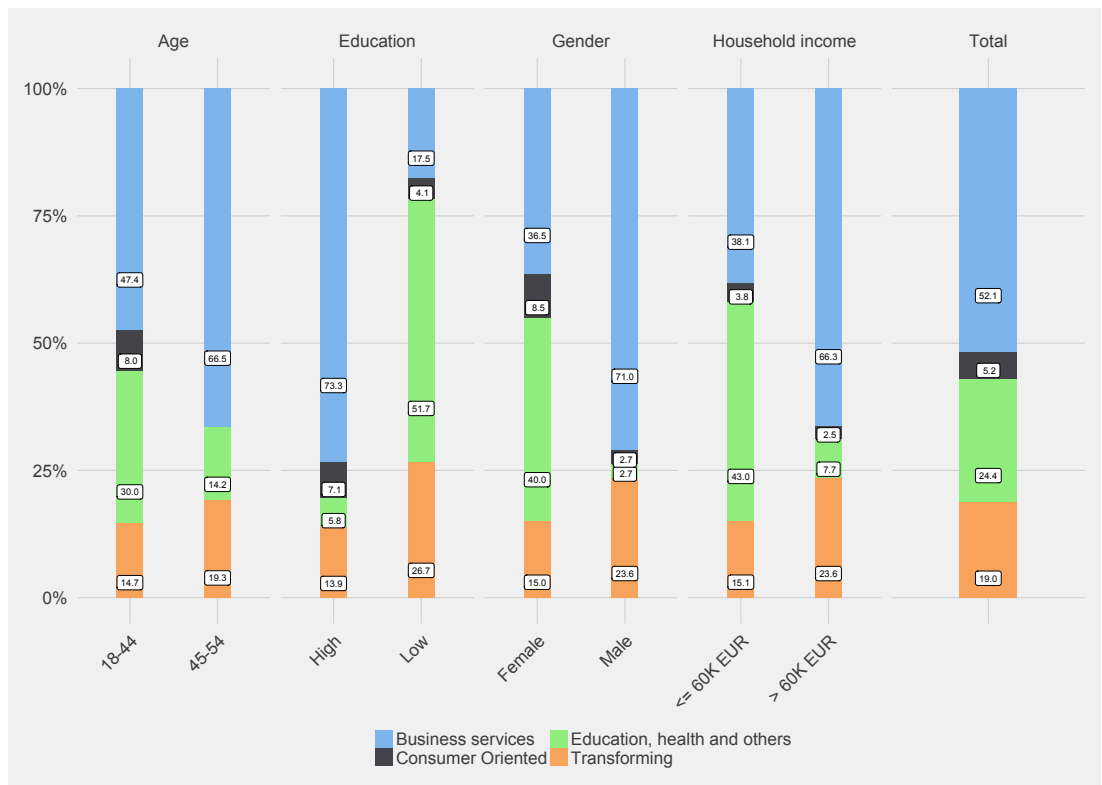


Figure 3.15: Established by industry and entrepreneurs traits (2017).

3.3.4 Innovativeness

The introduction and diffusion of innovation is an important outcome of the entrepreneurial process. New ventures are generally regarded as radically innovative because they are able to identify and exploit business and technological opportunities more efficiently than older firms. GEM uses two main indicators to establish the innovativeness of new ventures: 1) the share of customers perceiving the main product of the new or established venture as new or unfamiliar; 2) number of competitors offering the same product.⁶

Figure 3.16 shows the percentage of innovative TEA and innovative established firms. Innovativeness here is defined as the proportion of TEA or established ventures that sell at least one product that is new to all or some customers AND few/no other businesses offer the same product. Figure 3.16 shows that roughly 50% of TEA are innovative compared to 25% of established firms. The proportion of innovative TEA ventures is the highest in Europe which have an average of 28.7% (GEM Global, 2018, p. 117). **Early stage entrepreneurs are the most innovative in Europe and they tend to report consistently more innovativeness than more experienced entrepreneurs.**

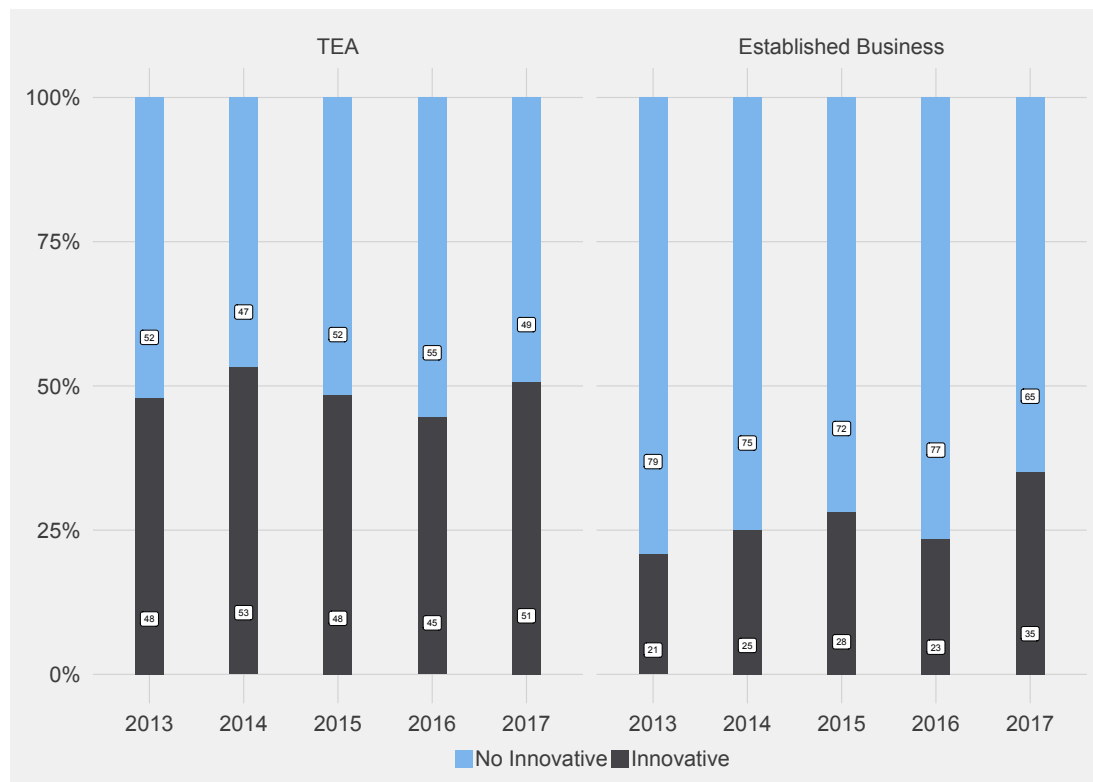


Figure 3.16: Innovation of TEA and established (2013-2017).

⁶Note that respondents to this question are managers/owners of the business - and not their customers. Thus, the answers does not reflect the market's perception but managers' beliefs.

3.3.5 Funding

Starting and running a new business requires adequate access to capital. Lack of funding is one of the biggest hurdles to entrepreneurial activity. Start-ups may have problems to collect necessary capital because financial systems may be reluctant to fund businesses that have not been proven profitable. Many start-ups fail to attract adequate financing because of the difficulty of assessing the quality of new business ideas (e.g. Kerr and Nanda, 2011). Small and Medium sized Enterprises (SMEs) find more difficulties to finance their business than larger firms. In Luxembourg in 2017, loans less than 1 million € are 54 basis point more expensive than loans above 1 million€. In relative terms, SMEs pay 46% more in interest than large corporations. (OECD, 2018). Lack of funding (loans or equity) can prevent productive investments and slow growth. This section aims to provide information about the sources of funding available to business start-ups in Luxembourg. The overwhelming majority of entrepreneurs need external sources of funding. One observes that 7% of respondents declare to have provided funds (loans or equity) for a new business started by someone else (Figure 3.17). Out of two thirds of the respondents that declared their contribution, 50% contributed less than 10,000 €, a further 26% provided between 10,000 and 50,000 €, and 24% provided more than 50,000 €. One can see that close family and friends are giving most of the funding. This result is in line with the argument that family and friends are the primary sources of financing for start-ups (Kotha and George, 2012).

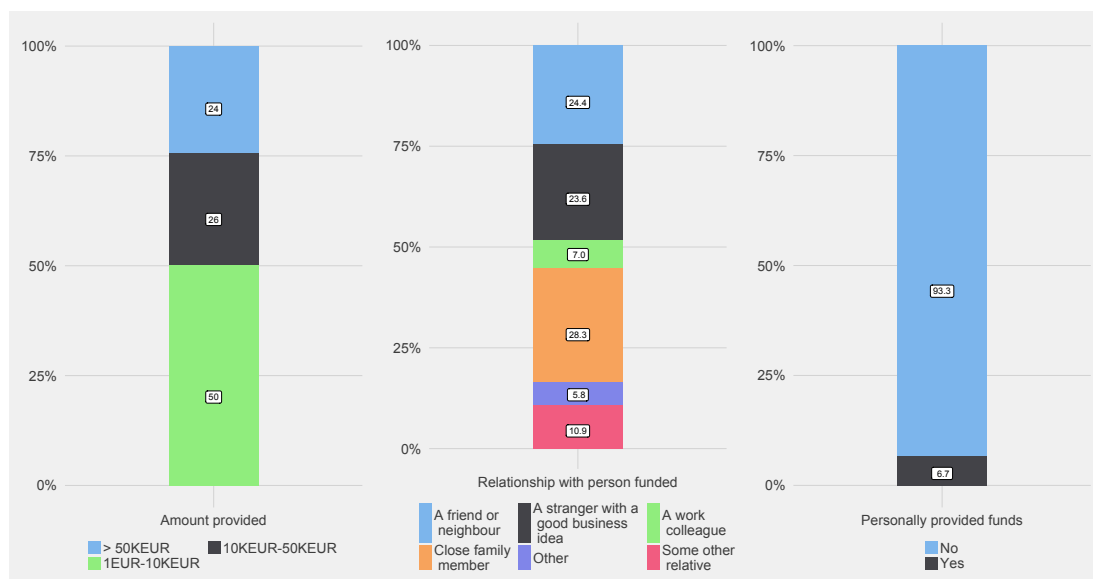


Figure 3.17: Funding of start-ups in Luxembourg 2017.

3.4 Entrepreneurship: a cross-country perspective

This section compares entrepreneurial attitudes and activities in Luxembourg to those of other countries. The analysis focuses first on measures of entrepreneurship and then on the perception that society has of entrepreneurial activities. Figure 3.18 reports the 2017 ranking of European countries participating in GEM according to their TEA rates. Estonia ranked first with a TEA of 19.4%. Luxembourg has the 6th highest TEA rate among European countries, the same ranking as the previous year.⁷ One should note that not all countries participate every year in GEM; e.g. Ireland and Belgium did not participate in 2017.⁸ Luxembourg's TEA rate, at 9.3%, is nearly one percentage point above the European average (held at 8.3%). The rate is comparable to those of other western European countries (TEA is 5.3% for Germany, 3.9% for France and 9.9% for Netherlands).

Figure 3.18 ranks countries according to the opportunity driven TEA measure (see section 3.2). One can see that Luxembourg ranked 6th out of 18 European countries in 2017.

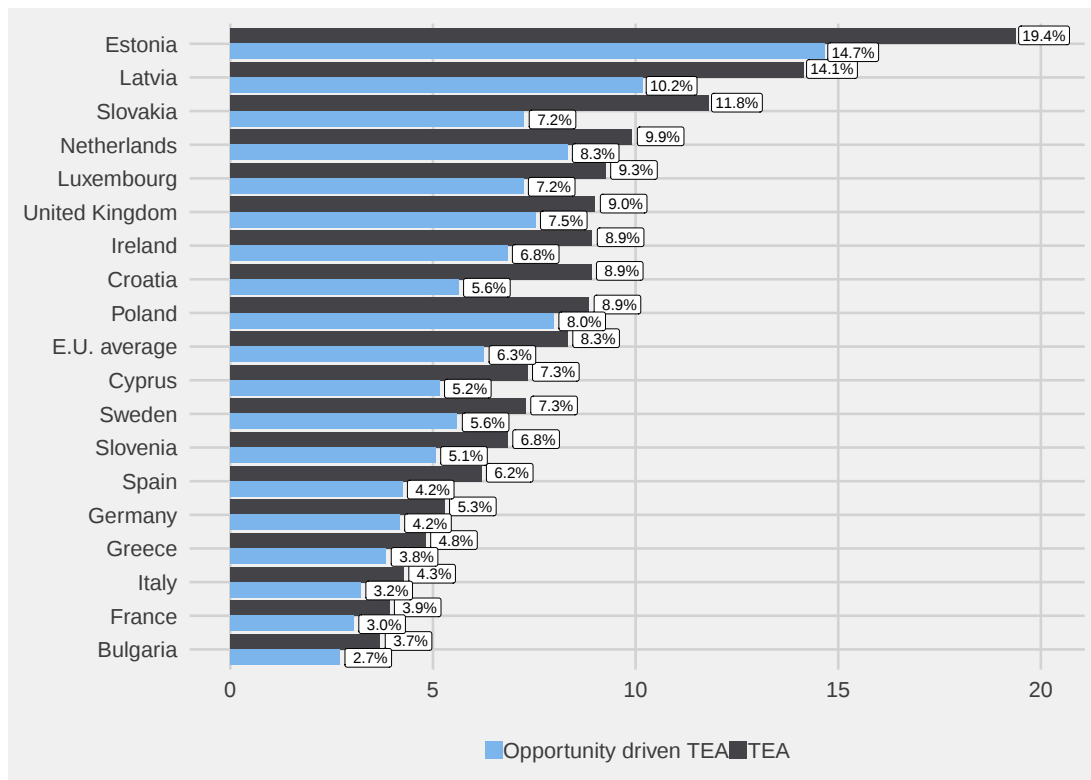


Figure 3.18: TEA and opportunity driven TEA in the EU: country ranking (2017).

⁷The TEA reported here differs from TEA reported in (GEM Global, 2018) because a more accurate weighting approach was used. See Annex for more details.

⁸Another relevant aspect is that efficiency-driven countries usually present higher TEA than innovation-driven countries (GEM Global, 2018).

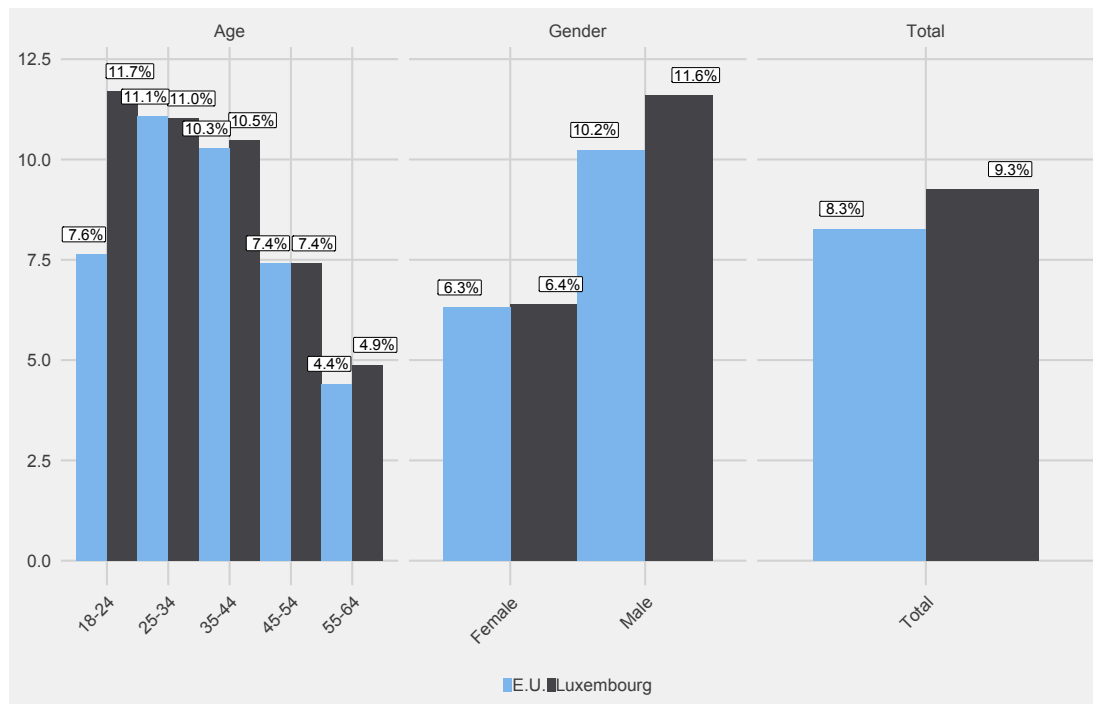


Figure 3.19: TEA by age and gender in Luxembourg and EU (2017).

Figure 3.19 compares TEA distribution (by age and gender) in Luxembourg to the European average. One observes that gender gap in entrepreneurship is also present at EU level. While women's involvement in entrepreneurship in Luxembourg is comparable to overall EU, the share of men entrepreneurs is higher in Luxembourg than in other European countries. Moreover, while the pattern of entrepreneurship across age classes is similar, in Luxembourg one notices a higher percentage of young people (18-24 years of age) involved in early-stage entrepreneurship.

Figure 3.20 compares entrepreneurial intentions and perceptions of entrepreneurship in Luxembourg with EU countries averages. In 2017, Luxembourg's potential entrepreneurship rate was higher than the EU average. 55% of Luxembourg's respondents stated that there were good opportunities to start a business in the country. This figure is much higher than the EU average which was held at 42%. (In 2016 respondents that perceived good opportunities to start a business were 50% of the population in Luxembourg and 36% in Europe.) This figure suggests that in recent years business conditions in Luxembourg were perceived as particularly favourable to entrepreneurs. Figure 3.20 suggests also a marked fear of failure among Luxembourg population. Indeed, fear of failure was higher in Luxembourg (nearly 51%) than in the E.U. (43%). The respondents that stated they possessed the knowledge and skills to start a business was slightly lower in Luxembourg (41%) than in the EU (nearly 44%). In addition, nearly 35% of respondents in Luxembourg reported that they personally knew someone who had started a business in the past 2 years. A similar percentage was observed in other European countries. In summary, **Luxembourgish residents believe Luxembourg as a good place to start a business. They perceive themselves as relatively skilled but fear failure more than the residents of other EU countries.**

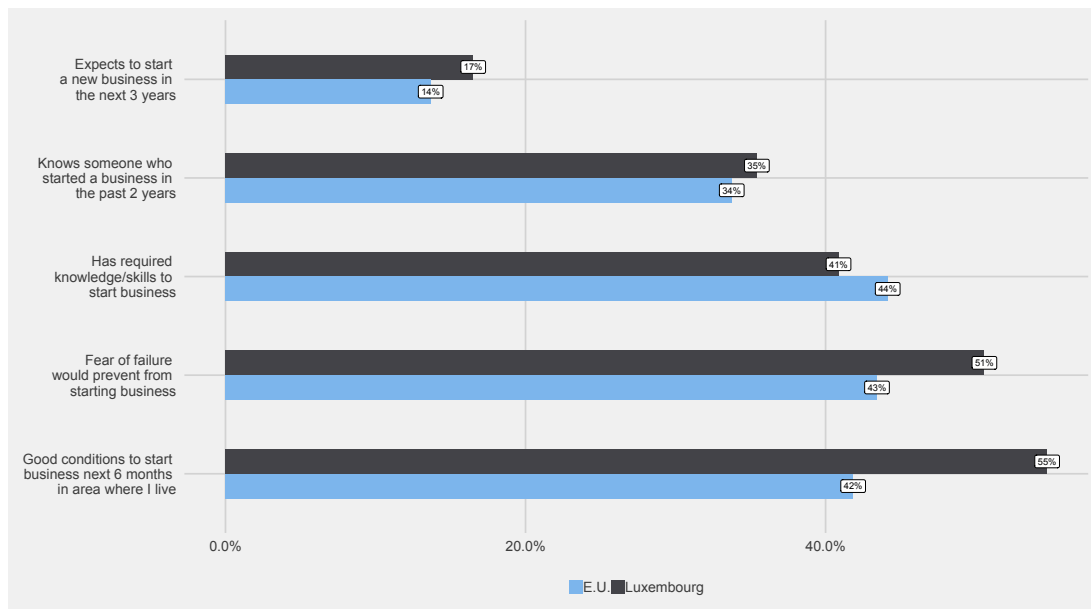


Figure 3.20: Luxembourg and E.U. countries: Entrepreneurial intentions, skills and fear of failure in Luxembourg and EU (2017).

One noticeable difference between Luxembourg and other European countries concerns the views that society holds on entrepreneurs and entrepreneurial careers. Figure 3.21 (middle panel) shows that 43% of respondents in Luxembourg regard starting a business as a good career choice compared to the average 60% of the European respondents. (In 2016, the percentages were 42% and 58%, respectively, in Luxembourg and the EU.). The left panel of figure 3.21 shows that successful entrepreneurs are highly regarded both in Luxembourg and in the EU (70% and 67% respectively). Media attitudes are a crucial factor in shaping the public perception of entrepreneurs (Levie et al., 2011). Media coverage of successful entrepreneurs can influence the perception and values of an audience. Myrick et al. (2013) showed that the media coverage of the death by pancreatic cancer of Steve Jobs had strongly influenced the perception of cancer

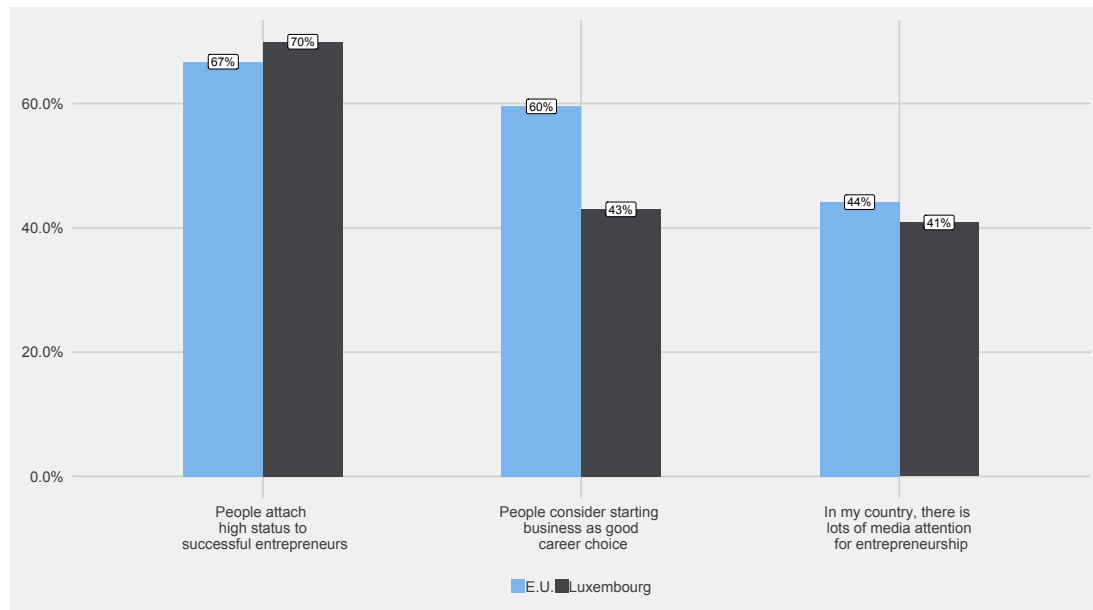


Figure 3.21: Societal perceptions of entrepreneurship In Luxembourg and EU (2017). (Unit: share of respondents in %.)

of young adults. In the same way, examples of entrepreneurial success can generate imitative processes and, as a result, influence the career choices of audiences. Mass media alerts are capable of reinforcing their audiences' existing values on entrepreneurial activities, but are less effective in radically changing those values (Hindle and Klyver, 2007). Finally, 41% of the Luxembourgish respondents declared that the media provided a lot of information about entrepreneurship in 2017 (versus 44% in the EU). Overall, the data suggest that **perception of starting a business as a good career choice is consistently less favourable in Luxembourg over time than in the rest of Europe.**

In contrast to perceptions, Luxembourg data show a much higher proportion of respondents involved in setting up a business, both as part of their job or as individual initiatives, compared to the other European countries. At the initial phase of the entrepreneurial process, as mentioned in Section 3.1, entrepreneurial intentions were higher in Luxembourg than the EU average. Figure 3.22 contrasts the share of people actively engaged in entrepreneurial activities in Luxembourg and Europe. The share of people engaged in start-ups was higher in Luxembourg than in other European countries (respectively 12.9% and 9.7 %). The proportion of adults involved in setting up a business as part of their normal job - the Employee Entrepreneurial Activity (EEA) discussed in Chapter 2 - was higher in Luxembourg than in Europe (respectively 6.6% and 5.1%). Moreover, the proportion of people who provided funds for someone else's new business was higher in Luxembourg than in the EU (7.4% and 4.7% respectively). Previous reports showed similar figures (GEM Luxembourg, 2017), indicating the opening of a positive gap for Luxembourg. At the end of the entrepreneurship cycle, however, we find that significantly less people owned or managed an established business compared to the EU average (9% compared to 15.6%). Overall, **Luxembourg continues to offer a more dynamic environment for entrepreneurship compared to other European countries.**

Entrepreneurs can fail or discontinue their businesses for several reasons. Sometimes, companies close or exit a market because they are not profitable; or, businesses may

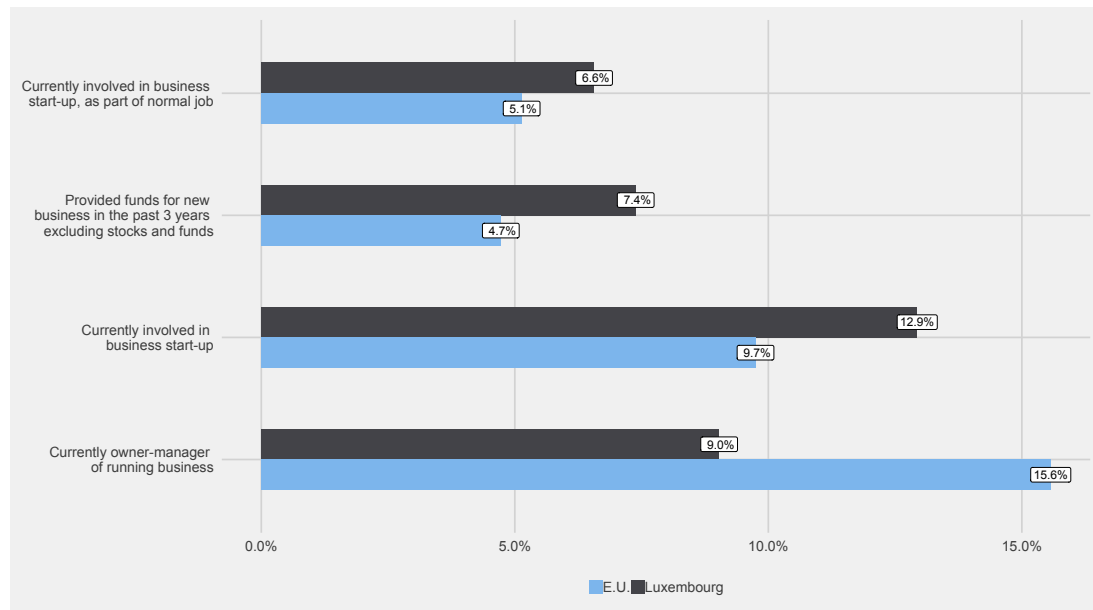


Figure 3.22: Entrepreneurial activities in Luxembourg and the EU (2017).

be sold/transferred because the owner retires. Figure 3.23 presents the most commonly reported reasons for exiting a business in Luxembourg and in the EU from 2013 to 2017. In Luxembourg, like in other EU countries, the two main reasons to close a business are lack of profitability and personal reasons. Another common reason to discontinue a business is for problems related to access adequate funding. Many entrepreneurs exit their business to engage in another job or business. The data indicates that generally Luxembourg exits are planned in advance (11% compared to 4% for the EU).

Remarkably, in 2017, the main difference concerning firm exit between Luxembourg and other EU countries was that **the proportion of entrepreneurs exiting due to opportunities to sell their business was considerably higher in Luxembourg (11%) than in the rest of Europe (2%).**

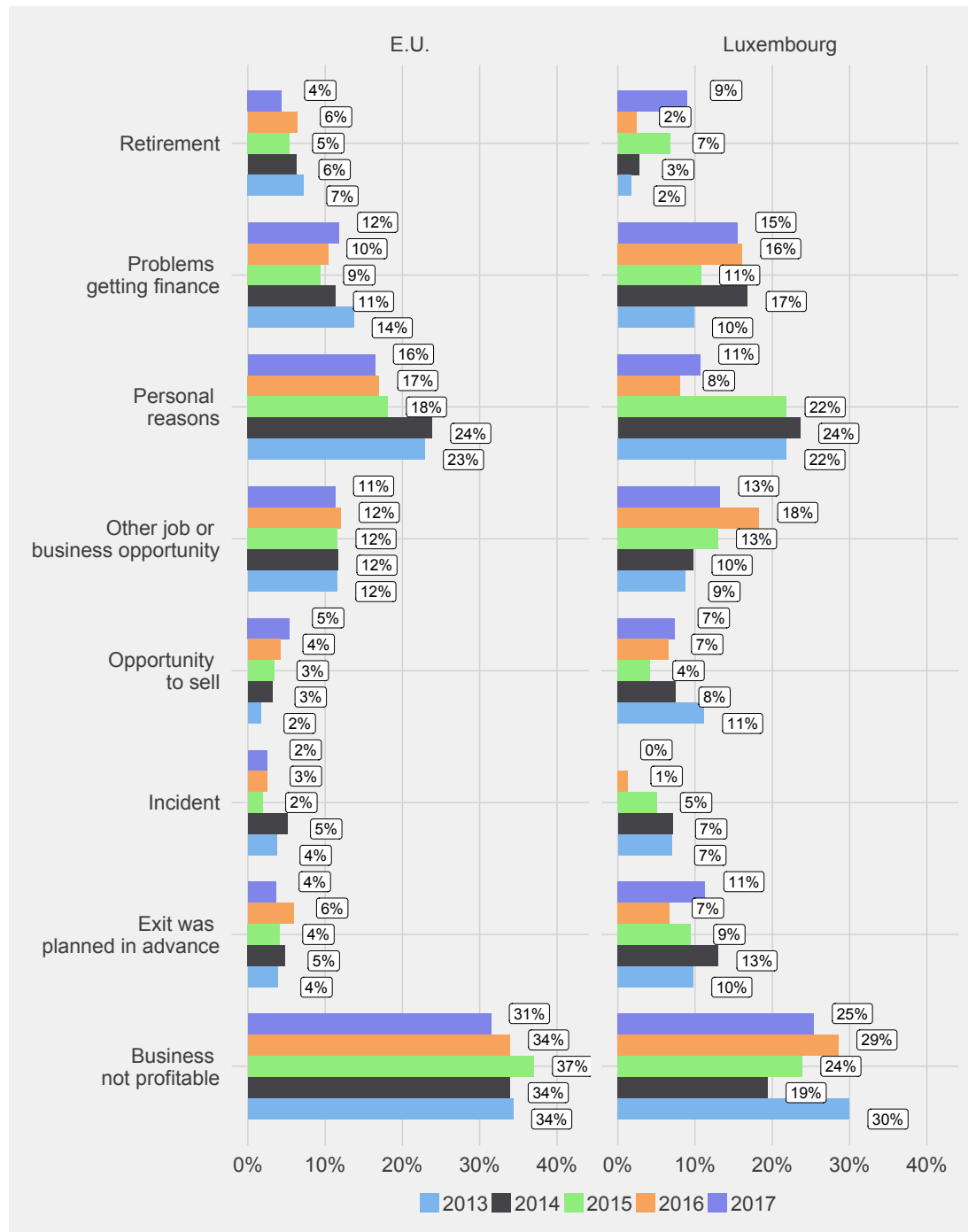


Figure 3.23: Entrepreneurial discontinuation in Luxembourg and the EU (2017).

Chapter 4: Results from National Expert Survey

Entrepreneurial Framework Conditions (EFCs hereafter) refer to business opportunities, entrepreneurial capacities, infrastructure and individuals' preferences, which, in turn, impact the creation and development of businesses' and entrepreneurial success. By collecting information from the national experts' interviews on EFCs, GEM captures informed judgements regarding the entrepreneurial ecosystem (GEM Global, 2018). This section presents a comparative assessment of the entrepreneurial ecosystem of Luxembourg based on data from the National Expert Survey (NES). NES assesses the entrepreneurial ecosystem through the measurement of a set of 9 Entrepreneurial Framework Conditions indicators: entrepreneurial finance; government policy; government entrepreneurship programs; entrepreneurial education; R&D transfers; the commercial and legal infrastructure; barriers to entry; physical infrastructure; and cultural and social norms. Table 4.1 describes in detail the framework conditions. Each EFC is measured on the basis of answers to a set of questions. Experts evaluate adequacy of each EFC using a Likert scales of 9 points (1 = highly insufficient, 9 = highly sufficient). The following provides information about respondents' individual characteristics, and presents descriptive statistics on the entrepreneurial environment indicators.

Luxembourg's NES sample

Luxembourg's NES sample includes 36 experts from Luxembourgish private, public-private partnerships and public institutions (16, 7 and 13, respectively). Most of the experts are male (9 females and 27 males), hold a lower university degree (39%) or higher such as a Master or a Phd (58%) and the average age is 44 years. Finally, answering to multiple choice question about their activity, 14 experts describe themselves as entrepreneurs, 16 as a business and support service providers, 8 as educators, teachers, or researchers on entrepreneurship, 8 as policy-makers and 5 as investors or bankers.

Luxembourg's NES results

Figure 4.1 presents average EFC scores for 2017 in Luxembourg and other European countries. In Luxembourg, the 3 EFCs with the highest values are: physical infrastructure (6.9), government entrepreneurship programs (5.7) and commercial and professional infrastructure (5.7). In contrast, entrepreneurship education at primary and secondary school (3.2), internal market dynamics (3.5), and financing for entrepreneurs (4.1) are the 3 EFCs with the lowest values. These figures are very similar to the figures for 2016. In 2017 Luxembourg generally scores better than other European countries in all EFCs, especially in terms of governmental programs

Table 4.1: The 9 GEM's Entrepreneurial Framework Conditions (EFC) that describe the entrepreneurial ecosystem

1) Entrepreneurial Finance. This condition aims to capture the availability of financial resources — equity and debt — for small and medium enterprises (SMEs). It includes grants and subsidies)
2) Government Policy. The extent to which public policies support entrepreneurship. This condition has two components: a) General: Government perceives entrepreneurship as a relevant economic issue and b) Regulation: Taxes or regulations are either not discriminating on the grounds of size or encouraging new ventures and SMEs.
3) Government Entrepreneurship Programs. The presence and quality of programs directly assisting SMEs at all levels of government (national, regional, municipal).
4) Entrepreneurship Education. The extent to which training in creating or managing SMEs is incorporated within the education and training system at all levels. This EFC has two components: a) Entrepreneurship Education at primary and secondary school, and b) Entrepreneurship Education at post-secondary levels (higher education such as vocational, college, business schools, etc.).
5) R&D Transfer. The extent to which national research and development will lead to new commercial opportunities and is available to SMEs.
6) Commercial and Legal Infrastructure. The presence of property rights commercial, accounting and other legal and assessment services and institutions that support or promote SMEs.
7) Barriers to entry. This EFC includes two components: a) Market Dynamics: the level of change in markets from year to year, and b) Market Openness: the extent to which new firms are free to enter existing markets.
8) Physical Infrastructure. Ease of access to physical resources and infrastructure, such as communication networks, utilities, transportation, land or space—. This also captures cost of accessing such infrastructure faced by SMEs: prices should not discriminate against SMEs.
9) Cultural and Social Norms. The extent to which social and cultural norms encourage or allow actions leading to new business methods or activities that can potentially increase personal wealth and income.

(5.7 versus 4.4). However, the EFC internal dynamics is perceived much worse in Luxembourg than in other European countries (3.5 versus 4.9). In summary, experts on entrepreneurship suggest that infrastructures and government policies are the main strengths of the Luxembourgish entrepreneurial system. Primary education, internal market dynamics, and financing are the weakest points, or bottlenecks of the Luxembourgish entrepreneurial environment.

Overall, the survey at Luxembourgish experts suggests that **Luxembourg's institutional framework is generally perceived as supportive of entrepreneurial activities**. Access to infrastructure is also positively evaluated by experts. As in previous years, the **NES survey highlights some problems with respect to the education system and the market structure that prevents the free entry of new firms**. These results are largely consistent with the main findings of the study 'OECD Economic Surveys: Luxembourg'. The study is based on survey of business executives and investigates business ecosystem in general but identifies 'restrictive labour regulations' and 'inadequately educated workforce' as the most problematic factors for doing business (OECD, 2015, p. 35).

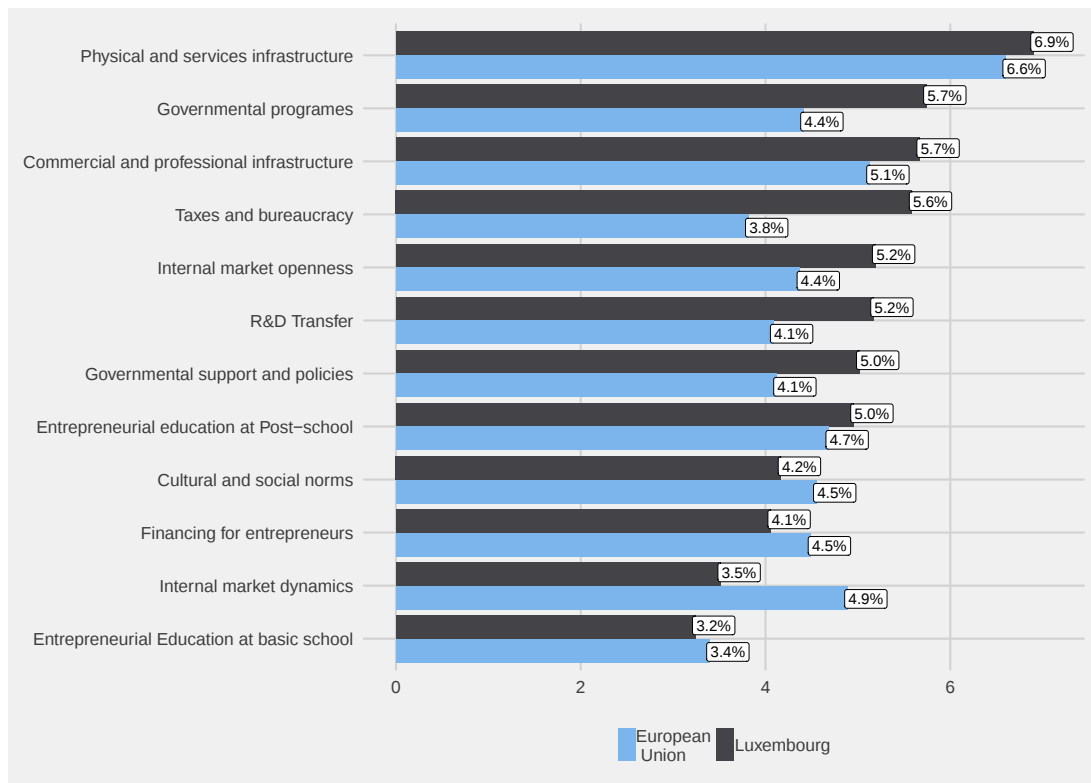


Figure 4.1: Average expert scores for Luxembourg's EFCs (Likert scales of 9 points (1 = highly insufficient, 9 = highly sufficient), 2017)

4.1 Barriers and enablers of entrepreneurship

To complement the experts' opinions in 2017 we asked all respondents of the Adult Population Survey to assess barriers and enablers of the Luxembourgish entrepreneurial ecosystem. Seven dedicated questions that are specific for Luxembourg were asked to measure their agreement with the following statements:

- 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

Figure 4.2 shows the assessment of these statements by TEA status. This is relevant because some barriers can be better assessed by somebody who is actually engaged in entrepreneurial activities. More than half of the TEA entrepreneurs at least somewhat agree that dedicated

training programs are available and that they can easily access needed information (first and second group of bars in Figure 4.2). 50% of entrepreneurs at least somewhat agree that it is easy to access potential customers compared to nearly 25% of non-entrepreneurs, suggesting a strong difference in perception between these two groups. The two groups differ also on the perception of the availability of time to launch a new firm. Entrepreneurs have more time to start a new business (nearly 50% of entrepreneurs at least somewhat strongly agree compared to 25% of non-TEA group). Interestingly, entrepreneurs and non-entrepreneurs agree there are difficulties when it comes to accessing funding (20% and 25% at least somewhat agree that funding is available) finding office space (21% and 14% strongly agree that office space is available) and obtaining qualified human resources (33% and 25% strongly agree that human resources are available). **Overall, national experts and the population agree that financing and availability of key resources such as office space and qualified human resources are the primary barriers to start or maintain a business in Luxembourg.**

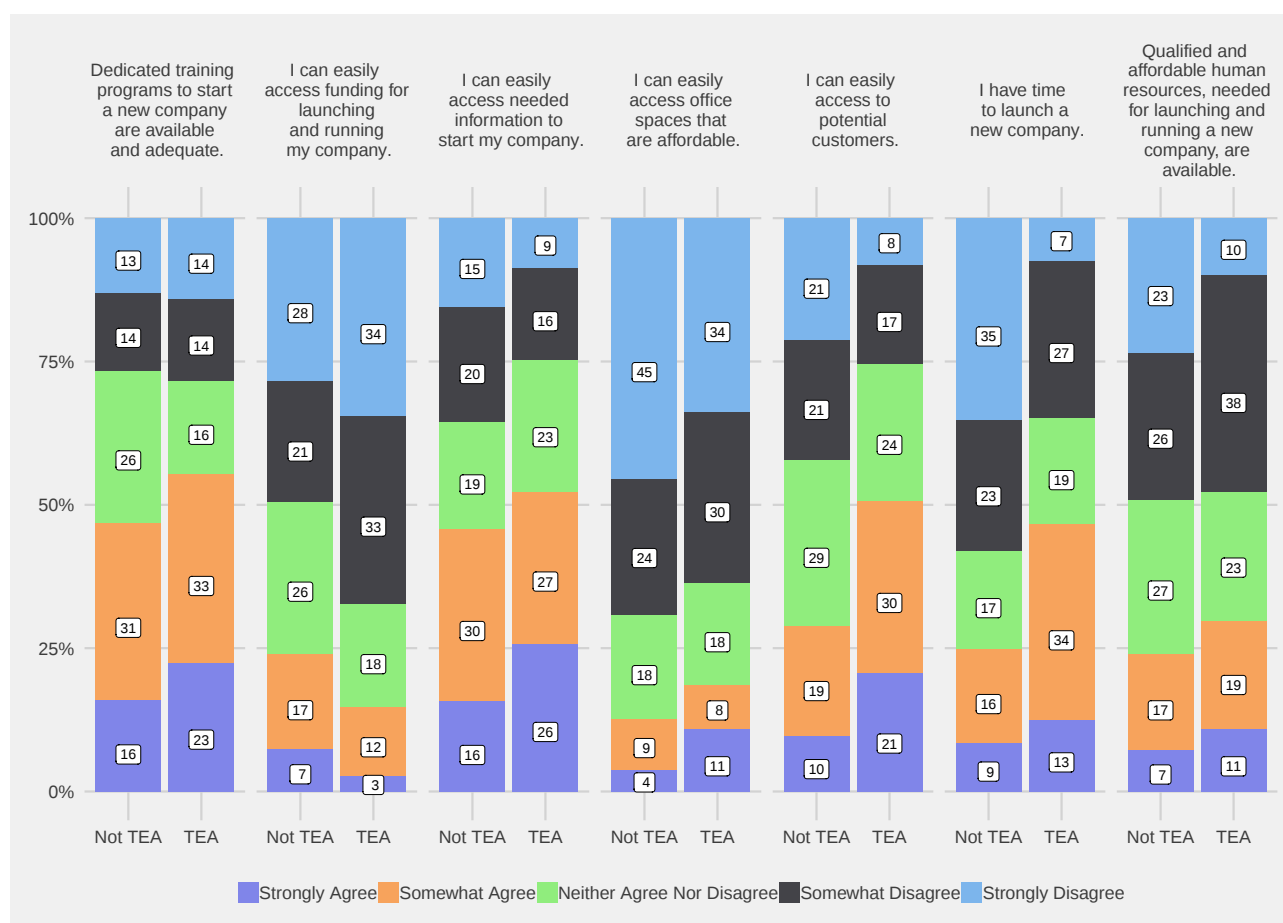


Figure 4.2: Assessment of barriers and enablers of Luxembourgish Entrepreneurial ecosystem by TEA status according to APS

Chapter 5: Policies, immigration and well-being in Luxembourg

This chapter investigates topics that are of particular interest for Luxembourg using dedicated questions asked only in Luxembourg in 2017. The section sheds light on the relationship between entrepreneurial activities and the structure of the population in Luxembourg that is characterized by a large proportion of immigrants. In addition, it reports on the well-being of residents, as GEM is the only source of information with annual frequency on this topic, which is of increasing relevance for Luxembourg. Finally, the link between entrepreneurial policies and perception of entrepreneurial activities is analysed in the last section.

5.1 Policies

Policy-makers and scholars regard entrepreneurial as an important engine of economic growth. Entrepreneurial initiatives and new businesses foster innovation, improve economic efficiency and create jobs. As a result, governments are stepping up efforts to support entrepreneurial activities with dedicated schemes and policies. In Luxembourg, several initiatives have been set up to foster entrepreneurial activities and improve public response and engagement in entrepreneurial activities (Nyuko, Fit4Entrepreneurship, Fit4Start, etc). As an example, Fit4Start is an initiative of Luxinnovation and Technoport that provides funding and advice to innovative start-ups of less than 12 months and composed of at least 2 persons. Other initiatives aim to provide ad-hoc training to students and school leavers, thus improving entrepreneurial education. (The National Experts indicate education about entrepreneurship is a major bottleneck affecting the Luxembourgish entrepreneurial ecosystem; see Section 4.) One such initiative, the *mini-companies* by Jonk Entrepreneuren, aims to foster students' entrepreneurial spirit since high school. Students are encouraged to set up their own company, to form teams to create a business plan, and to design and commercialize innovative products or services. The 2017 APS included a dedicated module to investigate the impact of such policies. The module is composed of the following questions:

1. *Has a campaign from institutional actors like the Chamber of Commerce, Government or an initiative that promotes entrepreneurship (Nyuko, Fit4Entrepreneurship, Fit4Start, etc) raised your interest in entrepreneurship?*
2. *Have you ever taken part in a training about how to start a business at secondary school? For example through specific projects like mini-enterprise or corporate relevant lessons in economics, accounting or management?*

3. *Have you ever attended a training which would help you to start a business after leaving school?*

The following charts report the distribution of answers according to the respondents' roles in the entrepreneurial process.

Notably, campaigns and training programmes seem to be positively associated with entrepreneurial activities. This suggests a **positive association between the provision of entrepreneurial training and setting up and running a new business**. In particular, figure 5.1 shows that 22% of the population received training related to entrepreneurship at secondary school; figure 5.2 reports the 20% of the population received entrepreneurship training after leaving the school. The proportion of individuals that attended a training is higher among entrepreneurs (nascent, new and established) than among non-entrepreneurs, which is in line with previous waves (GEM Luxembourg, 2017).¹ Overall, this suggests a positive association between entrepreneurial trainings and starting a new business. These results, although encouraging, should be interpreted with caution. Training programmes are relatively popular among entrepreneurs, this does not mean that training has directed them toward becoming entrepreneurs but entrepreneurs might still find the training useful. Indeed, the answers might simply indicate that the individuals that are more willing to start a business are more receptive to entrepreneurship-oriented initiatives, or are more motivated to learn entrepreneurial skills. The answers do not necessarily imply that institutional initiatives lead to an increase of entrepreneurial activities. Nevertheless, this is an encouraging result.

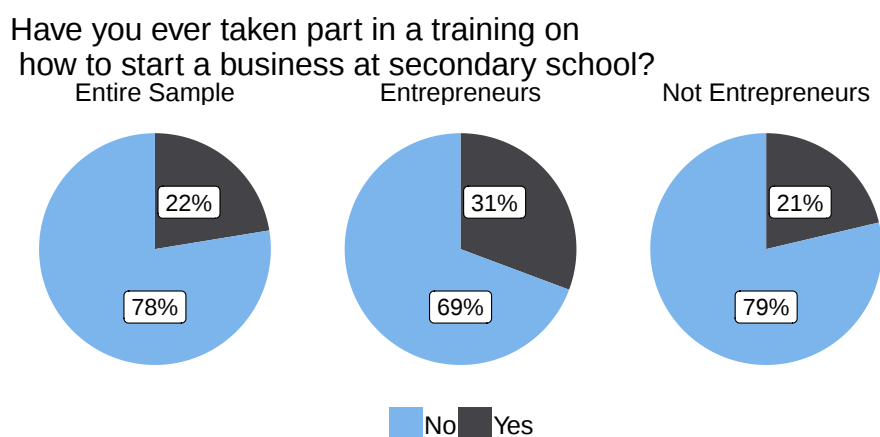


Figure 5.1: School trainings (2017).

Note: entrepreneurs are: nascent, new and established entrepreneurs.

Figure 5.3 shows that campaigns or initiatives of institutional actors have raised the interest in entrepreneurship for 13% of the whole population. Interestingly, this proportion is higher among entrepreneurs than non-entrepreneurs (34% compared to 10%) suggesting a **positive association between initiatives supporting entrepreneurial activities and running a business**.

¹More precisely, figures in report GEM Luxembourg (2017) focused on TEA entrepreneurship only while figures here include all entrepreneurs. This is not changing the validity of our the results. We computed figures of TEA and all entrepreneurs using data for 2017/2018 and for 2016/2017 and they show a very similar pattern.

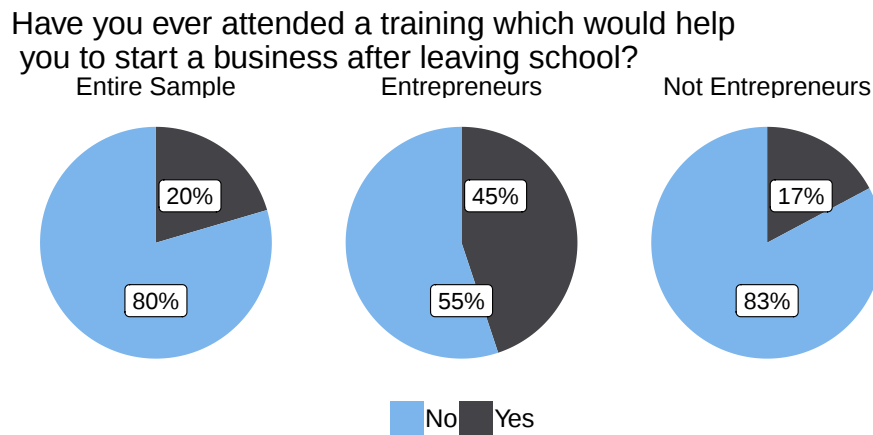


Figure 5.2: Training after leaving school (2017).
 Note: entrepreneurs are: nascent, new and established entrepreneurs.

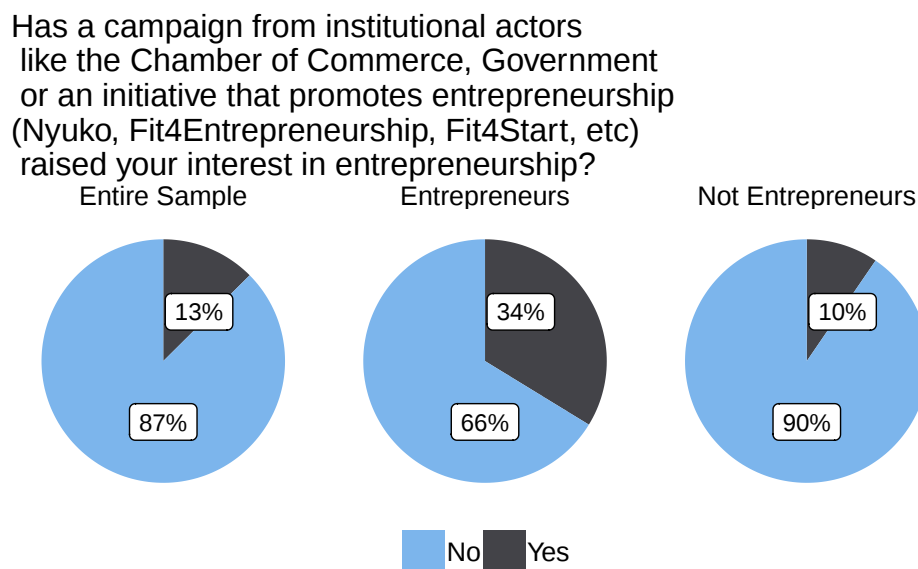


Figure 5.3: Impact of government campaigns (2017).
 Note: entrepreneurs are: nascent, new and established entrepreneurs.

5.2 Immigration

The issue of immigrants' involvement in host countries' economies and in entrepreneurship is of general interest. Inter-governmental and policy institutions, as well as academics, are devoting increasing attention to the role and perceptions of immigrants in host societies. Several publications and studies focus on the role of immigrants in entrepreneurial activities finding higher level of entrepreneurship among immigrants than natives (Stawinska, 2012; GEM Global, 2012; Kerr and Kerr, 2016). This issue is also of special relevance to Luxembourg in view of the country's population and labour force structure. Luxembourg is home to a large foreign population. About two third of the labour force is constituted by foreigners. Data on employment show that, at the end of 2017, 51 percent of resident workers were foreigners, while 45 percent of domestic employment was accounted for by cross-border workers.² Since 2013, GEM Luxembourg collects information on the migration background of respondents. To better capture this information, GEM focuses on the country of birth rather than on nationality. The survey distinguishes further between first generation immigrants, who are those born outside Luxembourg, and second generation immigrants. The latter are those respondents who have at least one parent born outside Luxembourg.

These data permit one to track migrant entrepreneurs in Luxembourg. A first econometric study on these data has highlighted how immigrants are more interested in starting a new business, but are not more likely than natives to become established entrepreneurs (Peroni et al., 2016). This suggests that may exist barriers and limitations to immigrant entrepreneurs, although further evidence should be gathered. The following presents descriptive statistics on the involvement of immigrants in entrepreneurial activities in Luxembourg, and reports on the type of economic activities they participate in.

Entrepreneurial indicators by immigration background

Figure 5.4 shows that immigrants have greater chances to engage in early stage entrepreneurial activities, as measured by TEA. In 2017, TEA was 10.5%, 7.6%, and 7.3% among, respectively, first generation, second generation, and natives. The early-stage entrepreneurship rate among immigrants, however, has been steadily declining in the last three years. Figure 5.5 shows immigrants' involvement in established businesses. The proportion of first generation immigrants running an established business was 4.6% in 2017, higher than that for non-immigrants (2.5%) and second generation immigrants (1.6%), and up from 4.3% in 2016. **The proportion of entrepreneurs among first generation immigrants is consistently larger than for natives and second generation immigrants.**

²These data are retrieved from official statistics on domestic payroll: http://www.statistiques.public.lu/stat/TableViewer/tableView.aspx?ReportId=12916&IF_Language=eng&MainTheme=2&FldrName=3&RFPPath=92. One can also see (STATEC, 2017), and (Peltier et al., 2012) for data on the overall population from the CENSUS (2011).

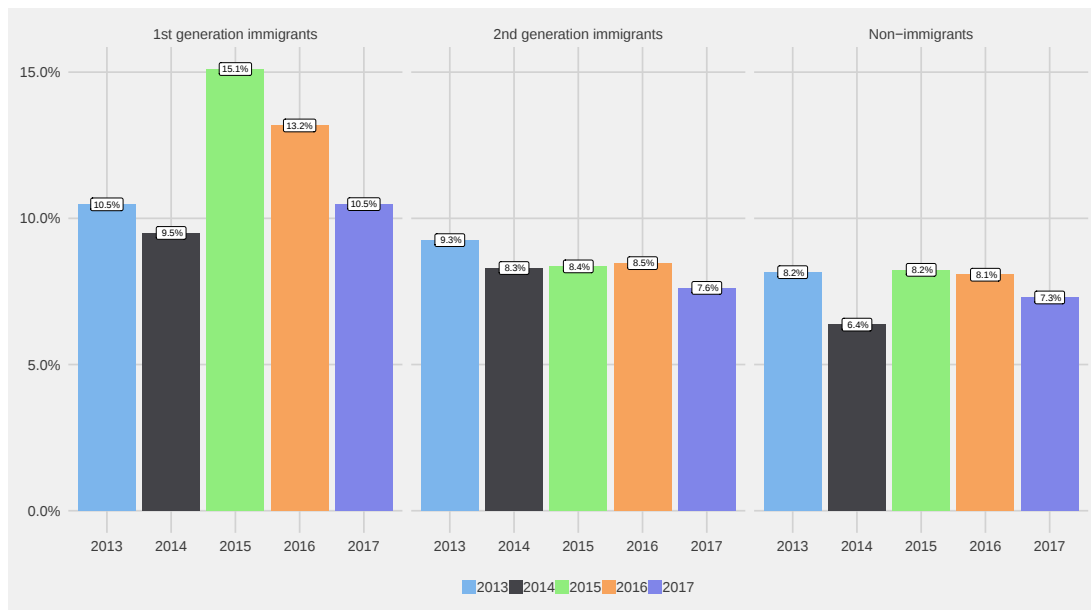


Figure 5.4: TEA rates by migration backgrounds (2013-2017).

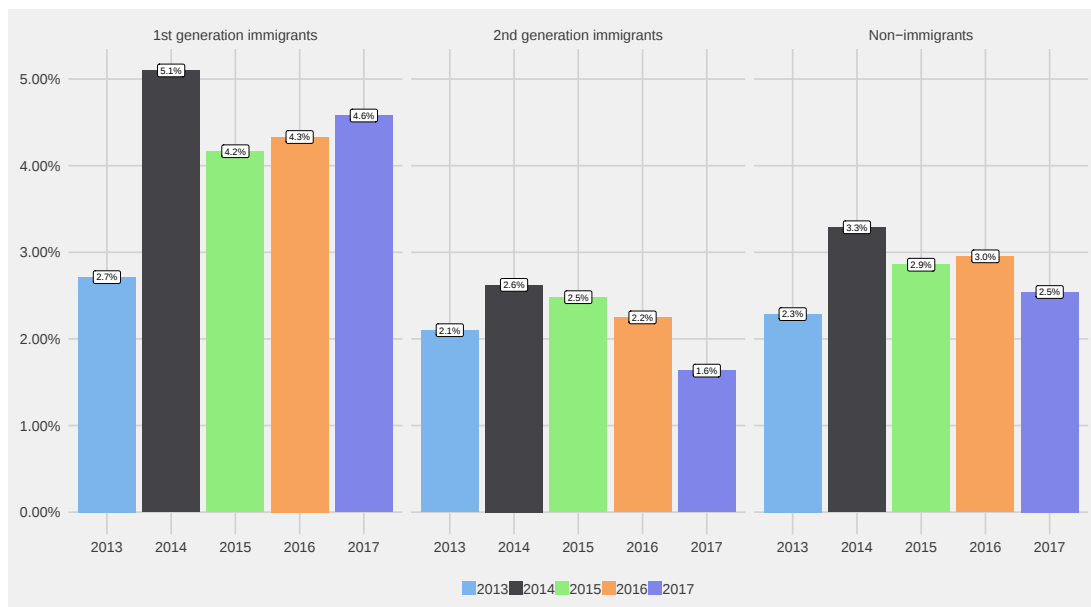


Figure 5.5: Established business rates by immigration background (2013-2017).

Economic activities and immigration background

What type of economic activities are migrant entrepreneurs engaged in? Figure 5.6 and 5.7 show that, although most immigrants' starts-ups are created in business services, non-native entrepreneurs are comparatively more active in the transforming industries when involved in early-stage entrepreneurship. This trend, however, changes dramatically when considering subsequent phases of the entrepreneurship cycle, namely established businesses. Figure 5.7 shows that nearly 60% of immigrants running established businesses are active in business services, in contrast to 48% of non-immigrants. Overall, in line with previous studies (Logan et al., 2003), these figures suggest that nationals and immigrants specialize in different industries.³

Several patterns emerge. Firstly, in Figure 5.6, one can see that in the early business activities (TEA), business services is the most common industry for both immigrants (37%) and non-immigrants (40%).

The comparison of Figure 5.6 and Figure 5.7, shows that the TEA and established companies differ in terms of industries. Interestingly, while 37% of new firms (TEA) established by immigrants are active in the business service industry, among firms older than 42 months, this percentage increases to 55%. For non-immigrants, the percentage of transforming firms increases from 16% in early stages to nearly 40% in later stages.

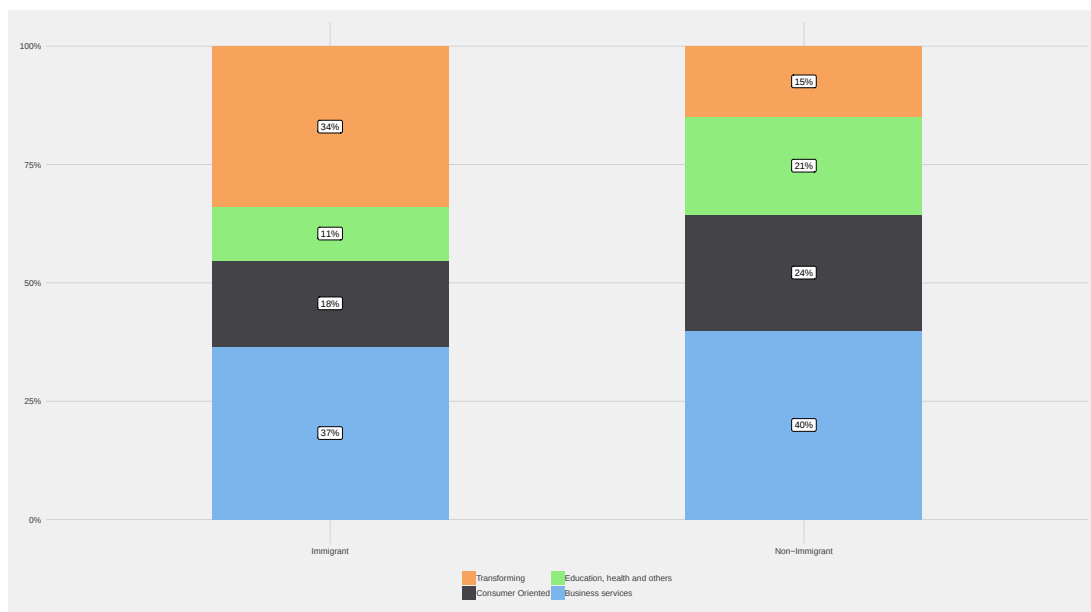


Figure 5.6: Immigration background: Industry of TEA (2017)

Note: Immigrants: First and second generation together

³Here, first and second generation immigrants are grouped together because of the relatively low number of observations.



Figure 5.7: Immigration background: Industries in Established Businesses (2017)
Note: Immigrants: First and second generation together

5.3 Well-being

In recent years, policy makers have engaged in efforts to complement traditional income-based measures of welfare with measures of well-being and quality of life. At the same time, a growing body of scholarly literature has examined determinants and consequences of well-being, often in connection with measures of economic growth and activity. Well-being, however, has seldom been studied in conjunction with entrepreneurship by economists so that our knowledge on this issue is limited (Uy et al., 2013).

A first issue that policy makers and scholars have faced is how to measure well-being. Policy organisations usually adopt a multi-dimensional view of well-being, often resorting to dashboards of indicators. In contrast, scholars focus on subjective well-being (SWB), a concept that refers to people's experience with their lives and is comprised of both emotional reactions and cognitive judgements (Diener, 1984). A common measure of SWB is life satisfaction, an overall cognitive judgements of satisfaction with one's life. Life satisfaction is a self-reported readily-available and reliable measure of well-being collected through large-scale surveys on individuals. In Luxembourg, however, information on SWB is scarce.

The Luxembourg's APS survey has included a dedicated question on respondents' life satisfaction since its inception. This question provides a much needed measure of residents well-being in Luxembourg, which also allows us to analyse the link between SWB and career choices.⁴

⁴The precise question reads as: We will ask you five statements that you may agree or disagree with. Please indicate your agreement with the items giving the appropriate number between one and five, where one means strongly disagree and five strongly agree.

1. In most ways my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life.
4. So far I have obtained the important things I want in life.

The first question of interest is whether entrepreneurs experience higher well-being than people making different career choices. Entrepreneurs can be happier than non-entrepreneurs because entrepreneurs experience more autonomy, drive and, sense of purpose than others. In contrast, new entrepreneurs might experience more stress related to longer working hours and uncertainty than non-entrepreneurs or established entrepreneurs. Indeed, the data suggest that professional choices affect people's SWB. Figure 5.8 shows that the the percentage of respondents involved in TEA that declare to be satisfied with their life is lower than those people that have not engaged in entrepreneurship or that are running an established venture (non-TEA). In 2017, 13.9% of TEA entrepreneurs disagreed with the statement *I am satisfied with my life* compared to the 11.1% of other people, but this difference is not statistically significant. In the previous years, the difference of SWB between TEA and non-TEA was larger and always statistically significant. The SWB of Luxembourg can be compared with SWB of other countries only in 2013 when entrepreneurial well-being was a special topic of GEM and was investigated in all countries. Using the cross-sectional dataset, GEM Global (2013a) reported that European entrepreneurs exhibited relatively higher rates of subjective well-being in comparison to individuals who are not involved in the process of starting a business or owning-managing a business with the exception of respondents in Germany, Luxembourg, UK and Italy (GEM Global, 2013a, Table 5.1 in p. 67). **This figure suggests that, entrepreneurs perceive their life as less satisfactory than other people on average, but but the difference is smaller in 2017.**

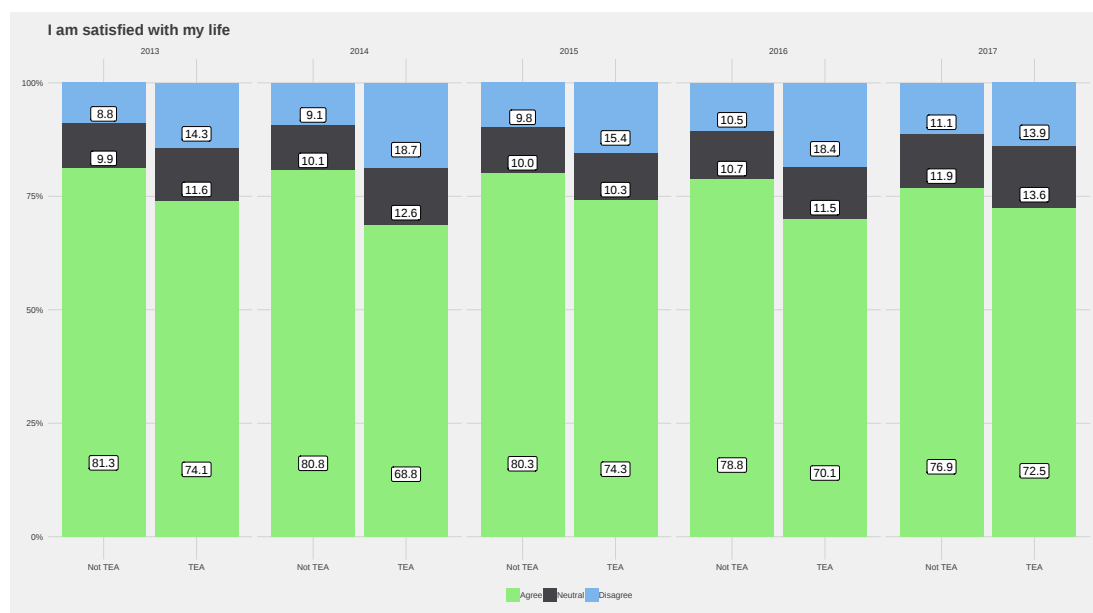


Figure 5.8: Subjective Well-Being by TEA (2013-2017).

Another issue that has emerged in the literature is the existence of a gender and age gap in entrepreneurial well-being. The following graphs show the life satisfaction of entrepreneurs by gender (Figure 5.9) and age (Figure 5.10). Figure 5.9 shows that subjective well-being is relatively stable over time. The proportion of satisfied entrepreneurs differs across gender in all waves but the differences are reduced in 2017. In the last wave, the proportion of

5. If I could live my life again, I would not change anything.

entrepreneurs that are not satisfied with their lives is similar across men and women (14% and 13% respectively). Well-being is higher among non-entrepreneurs than entrepreneurs and it does not exhibit significant differences across gender. **Women entrepreneurs are less satisfied with their life than men entrepreneurs but this gender satisfaction gap among entrepreneurs appears to shrinking in recent years.** Figure 5.10 suggests that age is not influencing life satisfaction among adults who are not engaged in entrepreneurship. The proportion of non-entrepreneurs declaring to be not satisfied with their life is nearly the same for people aged 18 to 34 and people aged 35 to 64 (11% and 11% respectively). Looking at the entrepreneurs, the 35-64 year-old entrepreneurs show more variability than 18-34 year-old entrepreneurs. However, in 2017 the percentage of unsatisfied individuals is remarkably lower among older than younger entrepreneurs (10% and 19% respectively). A possible interpretation of the patterns in Figure 5.9 and Figure 5.10 is that entrepreneurs, especially if female, face problems in balancing work and private life. This interpretation is in line with the literature emphasising the importance of work-family balance (Jennings and McDougald, 2007). Another possible reason is that women face more barriers than men. Further analysis, however, is required to better understand the relationship between entrepreneurship and subjective well-being.



Figure 5.9: Subjective well-being by gender (2013-2017).



Figure 5.10: Subjective well-being by age class (2013-2017).

Chapter 6: Creative activities: tinkers and inventors in Luxembourg

Different typologies of entrepreneurs have been proposed in literature (Acs and Audretsch, 2010). Entrepreneurs are often portrayed as risk-takers, creative and innovative business men and women. Entrepreneurs are risk takers as they purchase goods at certain prices in the present to sell at uncertain prices in the future; thus, they inter-temporally organise factors of production. Entrepreneurs are innovators that identify market opportunities and use innovative approaches to exploit them. Schumpeter (1934) first introduced the distinction between invention - the creation of new technology - and innovation - the successful commercialization of inventions. Another feature of entrepreneurs is the ability to combine already existing resources in creative ways. Toutain and Fayolle (2009) depicted the entrepreneur as a ‘tinkerer’, a bricoleur that copes creatively and flexibly with complex situations. Bricolage outcomes are often celebrated for their ingenious re-working of existing resources on hand to get the job done. The invention of the printing press is a well known example of combinatorial innovation. Gutenberg combined pre-existing items -ink, movable type and the screw press from wine production- to invent the press.

To investigate the role of tinkers and inventors in Luxembourg, the APS 2017 includes two dedicated questions:

1. *A tinkerer is someone who likes to play around and modify items in and around the house, related to a hobby, and so on. For example, you may tinker with software, tools or equipment, or with items for your household, garden, car, children, sports, hobby, or for health-related purposes. **In your leisure time, do you ever tinker in such a way?***
2. *An inventor is someone creates entirely new items, or adds new functionalities. For example related to software, tools or equipment, or for your household, garden, car, children, sports, hobby, or for health-related purposes. **Do you ever spend your leisure time on inventing new items?***

The following charts compares answers of entrepreneurs to answers of those respondents who are not involved in entrepreneurial activities. This provides some insights on the association between bricolage, invention and entrepreneurship. Figure 6.1 shows that the proportion of regular tinkers is higher among entrepreneurs (27%) than among non-entrepreneurs (22%); 36% of all individuals declared no tinker activities, 42% some occasional activity and 22% regular activity. Figure 6.2 reports the proportion of the population that spend leisure time to invent new items. 5 % of individuals regularly invent new items, 21% occasionally. Regular inventor

are much more common among entrepreneurs (15%) than non-entrepreneurs (4%) Overall, it appears that **there is a positive *association* between inventive activities and starting of a new businesses.**

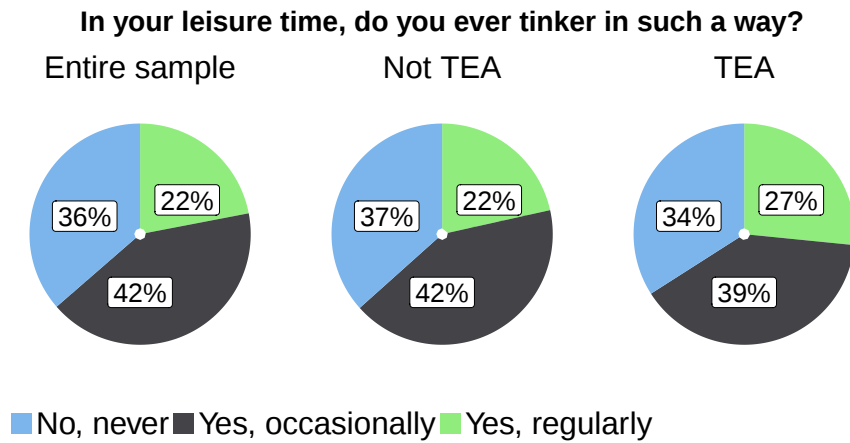


Figure 6.1: Tinker in Luxembourg, 2017

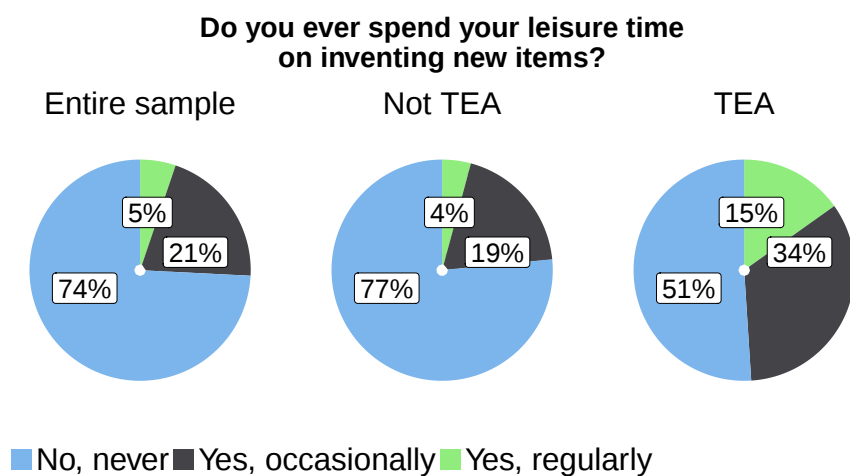


Figure 6.2: Inventors in Luxembourg, 2017

Chapter 7: Conclusions

Entrepreneurship is an important dimension of innovation and a driver of productivity, and ultimately an engine of economic growth. Every year, GEM (Global Entrepreneurship Monitor) collects internationally comparable data to better understand the evolution and the characteristics of entrepreneurial activities across countries. Based on GEM data, this report gives an overview of the state of entrepreneurship in Luxembourg, discussing its features in a comparative perspective. Like last year, the report integrates two new topics in the Adult Population Survey: barriers and enablers of the national entrepreneurial ecosystem and the link between policies and perception of entrepreneurship. This section draws the main conclusions of the GEM report 2017/2018.

Barriers and enablers of the entrepreneurial ecosystem

Institutional and cultural differences shape the entrepreneurial ecosystem and come together to determine the outcomes of the entrepreneurial process. Results of the National Expert Survey show that infrastructures and governmental policies are the main strengths of the Luxembourgish entrepreneurial ecosystem. In contrast, the low level of entrepreneurial education in primary and secondary school is identified as the main weaknesses. Experts perceive that the primary and secondary education system is not sufficiently encouraging and supporting of the undertaking of personal initiatives. Nevertheless, 22% of adults report that they have attended courses on how to start a new business in secondary school. National experts and the adult population all point out that *financing and availability of key resources such as office space and qualified human resources are the major barriers to entrepreneurship in Luxembourg*.

The key indicator provided by the GEM dataset of the entrepreneurial activity is the early-stage entrepreneurial activity (TEA). This measure is defined as the proportion of entrepreneurs relative to the total resident population. In 2017, the proportion of entrepreneurs in Luxembourg is 9.3% which is higher than the European average (8.3%). Luxembourgish early-stage entrepreneurial activity is confirmed to be one of the highest among other developed countries. In 2017, Estonia (19.4%) and Canada rank the highest (18.8%); France (3.9%) and Italy (4.3%) rank the lowest.

Entrepreneurship measures are relatively stable over time

The comparison of GEM data from the available surveys shows that entrepreneurial conditions are not substantially changing. New data from the GEM 2017 survey confirm that entrepreneurs in Luxembourg are primarily motivated by the desire for independence rather than by necessity. In the period 2013-2017, TEA fluctuated around 9% (8.7% in 2013, 7.1% in 2014, 10.2% in 2015, 9.2% in 2016 and 9.3% in 2017).

The profile of the entrepreneur and start-ups

Efficient policies aiming to promote entrepreneurship require a deep knowledge of different typologies of entrepreneurs. Given the budget constraints faced by governments, it is important that policies target groups of individuals and new businesses that may benefit most. The main features and the different typologies of entrepreneurs and start-ups emerging from the GEM surveys are summarized and presented below:

Gender: In 2017, the share of early entrepreneurs among men (12.5%) was higher than the share of new entrepreneurs among women (5.9%). This difference is relatively stable over time.

Immigrant: Immigration in the country is confirmed as an important source of entrepreneurship. In particular, first generation immigrants (not born in Luxembourg) play a major role in entrepreneurial activity.

Satisfaction: In 2017, new entrepreneurs continue to report being more dissatisfied with their lives (14%) than other people (11%). However, these perceptions of dissatisfaction decreased in 2017 compared to previous years. Especially female entrepreneurs reported higher satisfaction with their lives in 2017.

Inventor/Bricoleur: The proportion of the population that spends leisure time to invent new items is much higher among entrepreneurs (15%) than non-entrepreneurs (4%), implying a positive association between inventive activities and starting a new business

In addition to providing information on the individual characteristics of entrepreneurs, GEM also allows us to describe characteristics of start-up firms in Luxembourg. The typical start-up has one owner (51%), employs a maximum of 5 employees (90%), provides business services (34%) and is innovative (51%); this confirms the strong service orientation and innovativeness of Luxembourg's economy. Concerning the funding of new businesses, 7% of the interviewees (general population) answer that they provided funds for a new business started by someone else. Out of those who declared the amount provided, 50% provided less than 10,000 €.

Policies and entrepreneurship

New entrepreneurs and new businesses are important to foster innovation and employment. In Luxembourg government schemes aimed at fostering entrepreneurship in the country have been set up to this end. The policies aim to raise public interest in entrepreneurial careers, and provide training and funding for entrepreneurs. Data show that campaigns of government and the Chamber of Commerce (Nyuko, Fit4Entrepreneurship, Fit4Start, etc) have raised the interest in entrepreneurial career among 13% of the whole population.

Training programmes were popular among entrepreneurs, with one third of entrepreneurs declaring to have engaged in trainings at secondary school, and nearly a half after leaving school. These figures were higher for entrepreneurs than for non-entrepreneurs, which suggests a positive *association* between entrepreneurial trainings and starting a new business.

Future developments

This report illustrates the importance of collecting GEM data to investigate all aspects of entrepreneurship: the ecosystem, the individual entrepreneurs, and new businesses. GEM data complement business register data and provide a more comprehensive picture of entrepreneurial activities. Collecting data on an annual basis is particularly important to evaluate the evolution of entrepreneurial activities. This report sheds light on important aspects of entrepreneurship,

such as the evolution over time and the relevance of individual motivations. It also allows us to study the link between entrepreneurship and immigration background and life satisfaction. Other important aspects of entrepreneurship remain to be explored. Future research will focus on the econometric evaluation of entrepreneurship policies in Luxembourg and the drivers of dissatisfied entrepreneurs. Finally, while several thousands of individuals commute on a daily basis to Luxembourg to work and contribute to the Luxembourgish economy, the current APS survey neglects cross-border entrepreneurs because it only covers adult residents in Luxembourg. Future surveys will attempt to evaluate the magnitude of cross-country entrepreneurship in Luxembourg.

Bibliography

- Acs, Z. J. and Audretsch, D. B. (2010). New-York: Springer.
- Almus, M. and Nerlinger, E. A. (1999). Growth of new technology-based firms: which factors matter? *Small business economics*, 13(2):141–154.
- Antoncic, B. and Hisrich, R. D. (2001). Intrapreneurship: Construct refinement and cross-cultural validation. *Journal of business venturing*, 16(5):495–527.
- Boyd, N. G. and Vozikis, G. S. (1994). The influence of self-efficacy on the development of entrepreneurial intentions and actions. *Entrepreneurship theory and practice*, 18(4):63–77.
- Cacciotti, G. and Hayton, J. C. (2015). Fear and entrepreneurship: A review and research agenda. *International Journal of Management Reviews*, 17(2):165–190.
- Colombo, M. G. and Grilli, L. (2005). Founders’ human capital and the growth of new technology-based firms: A competence-based view. *Research Policy*, 34(6):795–816.
- Colombo, M. G. and Grilli, L. (2010). On growth drivers of high-tech start-ups: Exploring the role of founders’ human capital and venture capital. *Journal of business venturing*, 25(6):610–626.
- Cooper, A. C. and Bruno, A. V. (1977). Success among high-technology firms. *Business Horizons*, 20(2):16–22.
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, 95(3):542–575.
- Driver, A., Wood, E., Segal, N., and Herrington, M. (2001). Global entrepreneurship monitor (gem)-2001 south african executive report. Technical report, INCE, Cape Town.
- Fossen, F. M. and Büttner, T. J. M. (2013). The returns to education for opportunity entrepreneurs, necessity entrepreneurs, and paid employees. *Economics of Education Review*, 37:66–84.
- GEM Global (2012). GEM GLOBAL REPORT 2012.
- GEM Global (2013a). GLOBAL ENTREPRENEURSHIP MONITOR 2013.
- GEM Global (2013b). GLOBAL ENTREPRENEURSHIP MONITOR: Special Report on Entrepreneurial Employee Activity .
- GEM Global (2018). GEM GLOBAL REPORT 2017/2018.

- GEM Luxembourg (2017). GEM GLOBAL REPORT 2016/2017.
- Hindle, K. and Klyver, K. (2007). Exploring the relationship between media coverage and participation in entrepreneurship: Initial global evidence and research implications. *International Entrepreneurship and Management Journal*, 3(2):217–242.
- Kerr, S. P. and Kerr, W. R. (2016). Immigrant entrepreneurship. Working Paper 22385, National Bureau of Economic Research.
- Kerr, W. R. and Nanda, R. (2011). Financing Constraints and Entrepreneurship Financing Constraints and Entrepreneurship. In *Handbook of research on innovation and entrepreneurship*, pages 88–103. Edward Elgar.
- Kotha, R. and George, G. (2012). Friends, family, or fools: Entrepreneur experience and its implications for equity distribution and resource mobilization. *Journal of Business Venturing*, 27(5):525–543.
- Levie, J., Hart, M., and Karim, M. S. (2011). Entrepreneurship and the Media: Do Media Portrayals of Entrepreneurs Matter ? Number December 2014, pages 1–16. Proceedings of the 2011 ISBE conference, Sheffield.
- Logan, J. R., Alba, R. D., and Stults, B. J. (2003). Enclaves and Entrepreneurs: Assessing the Payoff for Immigrants and Minorities1. *International Migration Review*, 37(2):344–388.
- Myrick, J. G., Willoughby, J. F., Noar, S. M., and Brown, J. (2013). Reactions of Young Adults to the Death of Apple CEO Steve Jobs: Implications for Cancer Communication. *Communication Research Reports*, 30(2):115–126.
- OECD (2015). OECD Economic Surveys: Luxembourg.
- OECD (2017). Entrepreneurship at a glance 2017.
- OECD (2018). Financing smes and entrepreneurs 2018: An oecd scoreboard -luxembourg-.
- Peltier, F., Thill, G., and Heinz, A. (2012). ‘La population par nationalité.’ In S. Allegrezza, D. Ferring, H. Willems & P. Zahlen (Eds.), Recensement de la population 2011: Premiers résultats N4. Technical report, STATEC, University of Luxembourg, Integrative Research Unit on Social and Individual Development (INSIDE).
- Peroni, C., Riillo, C. A. F., and Sarracino, F. (2016). Entrepreneurship and immigration: evidence from GEM Luxembourg. *Small Business Economics*, 46(4):639–656.
- Roster, Catherine A., R. R., Albourn, G., and Darin, K. (2004). A comparison of response characteristics from web and telephone surveys. *Journal of the Market Research Society*, 46(3):359–373.
- Schenker, N., Raghunathan, T. E., Chiu, P.-L., Makuc, D. M., Zhang, G., and Cohen, A. J. (2008). Multiple Imputation of Family Income and Personal Earnings in the National Health Interview Survey: Methods and Examples.
- Schumpeter, J. A. (1934). *The theory of economic development : an inquiry into profits, capital, credit, interest, and the business cycle*. Transaction Publishers, Harvard University Press.

- STATEC (2015). Regards sur l'utilisation des TIC par les particuliers. Technical report, STATEC.
- STATEC (2017). Domestic payroll employment by citizenship and country of residence 1995 – 2017.
- STATEC (2018). Population by canton and municipality 1821 - 2018.
- Stawinska, A. (2012). Entrepreneurship determinants: culture and capabilities. In *Entrepreneurship determinants: Culture and capabilities. Luxembourg*, pages 75–82. Eurostat, Lux.
- The European Commission (2012). *A new European approach to business failure and insolvency*. The European Commission.
- Toutain, O. and Fayolle, A. (2009). Le créateur d'entreprise est un bricoleur. *L'expansion Entrepreneuriat*, (1):20–26.
- Ughetto, E. (2016). Growth of born globals: the role of the entrepreneur's personal factors and venture capital. *International Entrepreneurship and Management Journal*, 12(3):839–857.
- UNESCO) (2011). *International standard classification of education*. United Nations Educational, Scientific and Cultural Organization (UNESCO), UNESCO Institute for Statistics.
- Uy, M. A., Foo, M.-D., and Song, Z. (2013). Joint effects of prior start-up experience and coping strategies on entrepreneurs' psychological well-being. *Journal of Business Venturing*, 28(5):583–597.
- van der Zwan, P., Thurik, R., and Grilo, I. (2010). The entrepreneurial ladder and its determinants. *Applied Economics*, 42(17):2183–2191.
- Westhead, P. and Cowling, M. (1995). Employment change in independent owner-managed high-technology firms in great britain. *Small Business Economics*, 7(2):111–140.
- World Economic Forum (2017). *The Global Competitiveness Report 2017–2018*.

Annex: The characteristics of respondents

The GEM survey targets the resident population of working age between 18 and 64 years. Respondents's answers are collected by means of both telephone and on-line interviews. These survey modes represent, respectively, a share of 40% and 60% of the total number of interviews. The use of online surveys is motivated by the fact that internet connections cover nearly 97% of the Luxembourgish population (STATEC, 2015) and that older respondents are often over-represented in telephone samples (Roster et al., 2004). The 2017 sample included 2033 individuals. Table 8.1 describes gender, age, country of birth, income, and region of residence of the unweighted sample of respondents. Table 8.1 reveals there are more women than men (53% versus 47%); about half of the interviewed were 45 to 54 years old; 73% of all respondents are born in Luxembourg (country of birth is less sensitive than nationality to possible changes of nationality or naturalizations). The Table 8.1 also shows that nearly one third of the respondents declared an upper secondary education level, and 24% a yearly household income of more than 100.000 €. Finally, the majority of respondents live in the south of Luxembourg and in Luxembourg-ville (respectively 38% and 17%). In what follows the statistics presented in Table 8.1 are compared with Luxembourg official statistics (STATEC, 2018). The respondents' region of residence and income is broadly similar to the one recorded by official statistics (STATEC, 2018). Official statistics report that 37% of the Luxembourgish population lives in the South (compared to the 38% of APS respondents), 36% in the centre (33% of APS), 16% in the north (16% of APS respondents) and remaining 12% in the est (12% of APS respondents). Official data on income refers to 2013 and can only be loosely compared. In 2017, 60% of APS respondents have an income of more than 60000 €, while official statistics reports that 50% of all household has at least yearly income of 53,784 € in 2013. Looking at other characteristics, *the unweighed sample over estimates the proportion of: woman, older adults, Luxembourg-born and better educated individuals*. For example, Luxembourg born are 73.7% in the sample while the proportion in the population is 46.2%. For this reason, observations are weighted to ensure that the distributions of respondents' characteristics are identical in the sample and overall population. This statistical procedure is commonly used in surveys to ensure that they adequately represent the overall population. The sample's representativeness is crucial in survey analysis because it tells us whether results from that sample are generalizable to the population, or are valid only for the subset of individuals under investigation. The weighting procedure requires that weighting variables are strongly correlated with the main variable of of interest to ensure representativeness. As the variables used for weighting -gender, age, country of births and education- are among the most important drivers of entrepreneurs engagement in Luxembourg (Peroni et al., 2016), we are confident that **all figures and tables presented in this report are representative of the Luxembourgish resident labour force**.

Table 8.1: Unweighted distribution of respondents' traits

<i>Gender</i>	
Male	46.6
Female	53.4
<i>Age Class</i>	
25-34	15.5
35-44	17.2
45-54	29.6
55-64	27.3
<i>Country of birth</i>	
Luxembourg	73.7
EU	22.3
No EU	3.9
<i>Education</i>	
Early	0.4
Primary	2.5
Lower secondary	13.3
Upper secondary	35.6
Craftsman	4.6
Tertiary (2-3 years)	8.7
Tertiary (3-4 years)	16.3
Master	16.0
Doctoral	2.6
<i>Income(Euro)</i>	
0-20000	2.9
20001-40000	15.1
40001-60000	21.2
60001-80000	20.3
80001-100000	16.6
100000+	23.8
<i>Region of residence</i>	
Luxembourg-ville	17.4
Center	16.1
South	38.2
North	15.8
East	12.6

Note: GEM APS Luxembourg 2017 unweighed statistics. About one fifth of the respondents do not know or refused to indicate their household income. Similar pattern is observed in other household survey [e.g.](Schenker et al., 2008).