

**ENTREPRENEURSHIP PERFORMANCE AND  
INFLUENCING FACTORS IN THE EU**

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- Spine -

"Entrepreneurship is neither a science nor an art.

It is a practice"

(Peter Drucker)

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## **Abstract**

Entrepreneurship is a driver of economic development, but also it is essential to consider the conditions which endorse remarkable changes in society. Therefore, the present study covers the literature gap by exploring the enhancing factors on entrepreneurship performance. Accordingly, to understand this matter, we aim to test the relationship between economic, social, governmental and innovative conditions and entrepreneurship performance, opportunity and necessity entrepreneurship.

The research considers a sample of 21 European Union (EU) countries over the period 2003-2018. For the methodology followed, a descriptive and quantitative analysis was conducted, which collected from the literature review and statistical databases, such as GEM, The World Bank, and Eurostat. Thus, we have applied the following statistical analysis: descriptive, ANOVA, correlation and multiple linear regression analyses. The results obtained have demonstrated an increase and significant relationship of entrepreneurial performance after the 2008 crisis. Additionally, economic, social, governmental and innovative conditions have generally had a negative impact on TEA, compared to a positive on necessity and opportunity entrepreneurship. There is a negative and significant effect between financial environment, population, governmental expenditures, innovation and entrepreneurship performance. A positive and significant relationship was identified between GDP, unemployment, macroeconomic environment, financial environment, age, population and necessity entrepreneurship. Likewise, there was a positive and significant impact between GDP, age and opportunity entrepreneurship.

To sum up, this study completes the literature through the analysis of the influencing factors on entrepreneurship performance and both motivations on a sample of 21 EU countries, during a period of sixteen years.

**Keywords:** Entrepreneurship, Economic Development, EU

**JEL Classification System:** L26 Entrepreneurship / P47 Performance and Prospects

## Resumo

O empreendedorismo é um impulsionador de desenvolvimento económico. Assim, é de igual importância considerarem-se as condições que estimulam a sociedade. Desta forma, o estudo apresentado preenche a lacuna da literatura, com a investigação dos fatores influentes no desempenho do empreendedorismo. Pretende-se assim testar a relação existente entre condições económicas, sociais, governamentais, inovadoras e o desempenho do empreendedorismo, empreendedorismo por oportunidade e necessidade.

A presente pesquisa considera uma amostra de 21 países da União Europeia (UE) no período de 2003-2018. A metodologia contemplou uma análise descritiva e quantitativa, baseada na coleta de dados, pela revisão de literatura e por bases de dados estatísticos, como GEM, Banco Mundial e Eurostat. Posteriormente, foram realizadas as seguintes análises estatísticas: descritiva, ANOVA, correlação e regressão linear múltipla. Os resultados obtidos demonstraram um aumento significativo no desempenho do empreendedorismo após a crise de 2008. Complementarmente, as condições económicas, sociais, governamentais e inovadoras obtiveram maioritariamente um impacto negativo no TEA, comparativamente a um efeito positivo e significativo no empreendedorismo por necessidade e oportunidade. Há um efeito negativo e significativo entre ambiente financeiro, população, gastos governamentais, inovação e o desempenho do empreendedorismo. Identificaram-se relações positivas e significativas entre PIB, desemprego, ambiente macroeconómico, ambiente financeiro, idade, população e empreendedorismo por necessidade. Ademais, há um impacto positivo e significativo entre PIB, idade e empreendedorismo por oportunidade.

Em suma, este estudo complementa a literatura através da análise dos fatores que influenciam o desempenho do empreendedorismo e as suas motivações numa amostra de 21 países da UE, num período de dezasseis anos.

**Palavras-chave:** Empreendedorismo, Desenvolvimento Económico, UE

**Sistema de Classificação JEL:** L26 Empreendedorismo / P47 Desempenho e Perspetivas

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## **List of Abbreviations**

**AMECO:** Annual macro-economic database of the European Commission's Directorate General for Economic and Financial Affairs

**APS:** Adult Population Survey

**EU:** European Union

**FDI:** Foreign Direct Investment

**GDP:** Gross Domestic Product

**GEM:** Global Entrepreneurship Monitor

**IMF:** International Monetary Fund

**NEC:** Necessity Entrepreneurship

**OECD:** Organization for Economic Co-operation and Development

**OPP:** Opportunity Entrepreneurship

**R&D:** Research and Development

**SD:** Standard Deviation

**SME:** Small and Medium-sized Enterprises

**TEA:** Total Early Stage Entrepreneurial Activity

**WEF:** World Economic Forum

## 1. Introduction

The entrepreneurship ecosystem is geographically shaped by complex interconnections which enhance economic growth, and there is much to be learned from it (Grilo & Thurik, 2004; Amoros et al., 2019; Crescente-Romero et al., 2019; Hechavarría & Ingram, 2019; Seguí-Mas et al., 2019).

GEM defines entrepreneurship as a new business or venture, as well as the development from a prevailing business or self-employment that describes its influence on economic growth (Reynolds et al., 1999).

According to WEF (2014), entrepreneurs are strategic boosters of economic and social development. They are catalysts for economic growth, as they turn gaps in the market into business opportunities. Therefore, policymakers follow strategies that encourage entrepreneurship, even though these are undetermined (Acs et al., 2016; Tominc, 2019). In this view, GEM distinguishes two drivers of becoming an entrepreneur: opportunity (OPP) and necessity (NEC). While the first are individuals who start a business voluntarily through advantage in the market, the second is when employment options are scarce or unacceptable (Angulo-Guerrero et al., 2017; Amoros et al., 2019; Content et al., 2019). These approaches, at a larger scale, have different effects on society, employment and the economy (Zwan et al., 2016; Amoros et al., 2019; Crescente-Romero et al., 2019). Amoros et al. (2019) maintain that the development of any economy influences both types of entrepreneurship. Hence, the opportunity-to-necessity ratio should be used as an indicator of economic and policy development (Acs, 2006; Content et al., 2019). Similarly, the manner in which entrepreneurial behaviour is affected by society has been receiving more attention from independent bodies, such as governments, universities, investors, media, and large companies (Crescente-Romero et al., 2019; Hechavarría & Ingram, 2019; Seguí-Mas et al., 2019).

Entrepreneurship is a channel for "spillover knowledge" since it encourages economic growth (Acs, 2013; Content et al., 2019). However, to recover from the economic and financial crisis, Europe has had to invest in innovative skills to be able to compete worldwide and improve the quality of life (Popovici & Călin, 2012; European Commission, 2019). Furthermore, the EU highlights the need to apply public policies that enhance its entrepreneurial capacity (Rodríguez-Pose & Cataldo, 2015; Amoros et al., 2019). According to WEF (2018), the level of TEA of EU Members in 2018 is 8.3%, compared with a global average rate of 12.3%. Moreover, in 2019, along with the United States and Turkey, this

average represented high TEA rates (Bosma & Kelley, 2019). Since the 2008 crisis, researchers have been paying more attention to the determinants of entrepreneurship (Rusu & Roman, 2018).

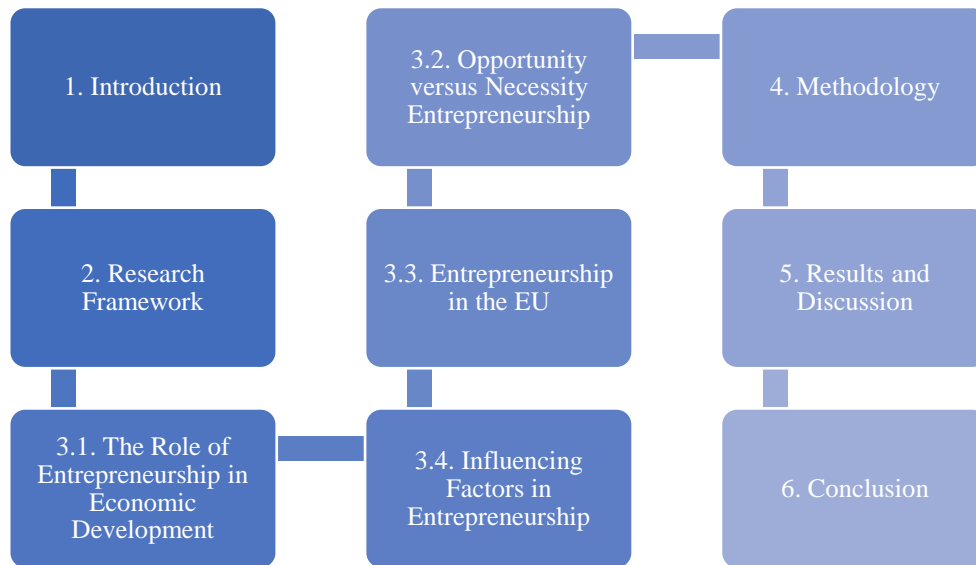
Many studies focus on the influence that entrepreneurship has on economics, rather than the impact that environmental conditions from societies may have on entrepreneurship (Acs et al., 2016; Seguí-Mas et al., 2019). Likewise, there are no advances in the effect that institutions and economic policies have on entrepreneurship (Bjørnskov & Foss, 2008; Amoros et al., 2019). Entrepreneurship, as a booster of economic development, aims at suitable conditions that promote significant economic growth and job creation. Although there is a gap in the literature on what factors positively affect entrepreneurship (Acs, 2006; Angulo-Guerrero et al., 2017), it is with this view that this study's fundamental question is: how is it possible that socioeconomic, governmental and innovative conditions can influence the performance of entrepreneurship in the EU countries?

Consequently, to answer this question, we intend to analyse the effects of the socioeconomic, governmental and innovative conditions on TEA, OPP and NEC, from EU countries, between 2003 and 2018. As for our specific goals, we want to deepen the theoretical description of the above in entrepreneurship performance in EU countries, and to analyse the impact of its development, before, during and after the financial crisis. What is more, we describe the relationship between socioeconomic, governmental and innovative dimensions, and TEA, OPP, and NEC.

## 2. Research Framework

This chapter intends to construct the theoretical key concepts which enable the structure of the research plan, through the hypotheses proposed in this work. Likewise, this study is organised into six chapters, based on the topics discussed above and the entire pre-defined structure to achieve the listed objectives, as shown in figure 1.

Figure 1 - Study Organisation



Source: Created by the author.

Chapter 1 contextualises the subject and the themes to be researched with the view to answering the main question (how is it possible that socioeconomic, governmental and innovative conditions can influence the performance of entrepreneurship in the EU countries?), which is then answered with both general and specific objectives. Therefore, we justify the organisation and our study's intention.

Subsequently, chapter 2 comprises the research plan, the review of relevant concepts, combined with the related references, helping to formulate the study's hypothesis.

Furthermore, chapter 3 presents the literature review. That is, the scientific basis used in the research and development, with pertinent approaches that fulfil these themes, by comparing the discussions of the most relevant authors in the area.

To achieve the objectives defined, chapter 4 describes the way forward, through the description of the study's methodological aspects:

type of research,  
 data collection and organisation,  
 quantitative analysis,

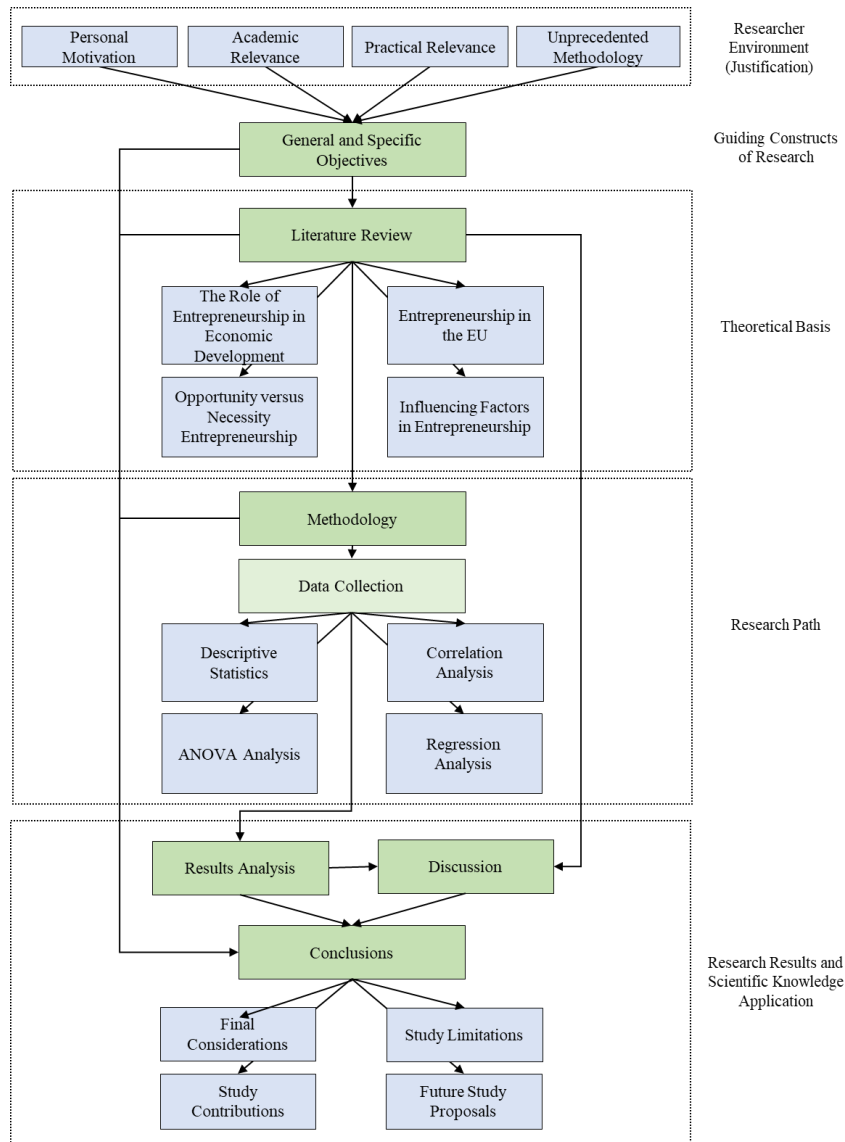
and methodological synthesis.

Chapter 5 presents the main results obtained, such as the crisis analysis on TEA levels, the correlation amongst the variables that influence entrepreneurial performance, NEC, and OPP, and the analysis of the effects that these variables have had in the types of entrepreneurship. Additionally, it shows the discussion between the results and the theoretical basis that demonstrate the scientific evolution provided by this study.

Finally, in chapter 6, we conclude with some final considerations, contributions and limitations of this study to the scientific community, followed by a proposal for future studies.

Based on the above explanation, we here present an overview of the mind map, as shown in figure 2.

Figure 2 - Research Mind Map



Source: Created by the author.

## 2.1. Main Concepts

This section defines the two most relevant definitions for a better understanding of this study. Since the definition of entrepreneurship varies amongst researchers, it is essential to clarify how this concept has been evolving. Consequently, as previous studies have defined TEA as the most suitable rate to measure entrepreneurial performance, it is valuable to elucidate its meaning before the next chapter.

### *Entrepreneurship*

The definition of entrepreneurship has had much attention from scholars (Hébert & Link, 1988; Grilo & Thurik, 2004). Throughout the years there has been the development of numerous theories about the measurement and elements of entrepreneurship, with no consensus on the most appropriate concept (OECD, 1998; Wennekers & Thurik, 1999; Wennekers et al., 2010). Nevertheless, all studies agree on the debatable impact that entrepreneurship performance has had on economic development (Baumol, 1990; Audretsch, 2003; Freytag & Thurik, 2007). Additionally, there is agreement concerning the systematic change over time and across countries (OECD, 1998; Freytag & Thurik, 2007). As a heterogeneous definition, it is noteworthy to address the spectrum of the most relevant approaches (Audretsch, 2003; Grilo & Thurik, 2004).

An entrepreneur is someone who probes opportunities through innovation (Schumpeter, 1965), who takes risks (Drucker, 1970), who makes decisions based on location and the use of goods, resources, or institutions (Hébert & Link, 1988). Filion (1999), argues that an entrepreneur makes both effective and efficient use of resources. However, for GEM, entrepreneurship is the endeavour to create either a new business or the expansion from a predominant organisation, which can be achieved by an individual, a group of individuals, or an established company (Reynolds et al., 1999).

These studies progressed from the characteristics of becoming an entrepreneur and his or her role in the economy, to the influencing factors in society that generate self-employment decisions (Freytag & Thurik, 2007). Nowadays, it is considered that the multidimensional feature of entrepreneurship implies it reacts to external factors which promote economic growth (Hechavarría & Ingram, 2019; Seguí-Mas et al., 2019). Furthermore, the European Commission (2019), upholds that entrepreneurship is the driving force of economic growth and job creation, making economies more competitive and innovative, by generating companies, launching markets and fostering new skills.



### *TEA*

TEA is the most significant rate, within GEM, to measure entrepreneurial performance (Freytag & Thurik, 2007; Crescente-Romero et al., 2019). It is the rate of active employees integrated into launching start-ups, the so-called nascent entrepreneurs, or when the company is forty-two months old (Reynolds et al., 1999; Bosma & Kelley, 2019).

GEM classifies the level of TEA by the proportion of respondents, who have started a business from the participating countries (Bosma & Kelley, 2019). Therefore, the database shows the reason why firms have been launched, distinguishing the types of performance entrepreneurship: opportunity and necessity (Bjørnskov & Foss, 2008).

Opportunity entrepreneurship is associated with innovative business ideas that generate employment and productivity. Whilst necessity entrepreneurship is the creation of firms due to the absence of employment options; the so-called push motives according to Reynolds et al., (2001), Zwan et al., (2016), and Content et al., (2019). Furthermore, both motivations influence the way new businesses effect on society and the economy (Baumol, 1990; Amoros et al., 2019). And the sum from these equal the overall TEA (Bjørnskov & Foss, 2008).

Competitiveness, productivity, innovation and economic growth are the foundations of TEA (Bashir & Akhtar, 2016). Hence, the dynamic disparity of the influencing factors on TEA demonstrate how entrepreneurial performance can affect the economy in several ways (Crescente-Romero et al., 2019).

## **2.2. Hypotheses**

External factors influence the condition of the entrepreneurial system (Hechavarría & Ingram, 2019; Seguí-Mas et al., 2019). What is more, GEM recommends that entrepreneurial performance is affected by differentiated environmental conditions (Reynolds et al., 1999), which empower or constrain entrepreneurship (Baumol, 1990). Furthermore, to answer to the main question of this study, as well as to reach both its general and specific objectives, the following hypotheses are purposed:

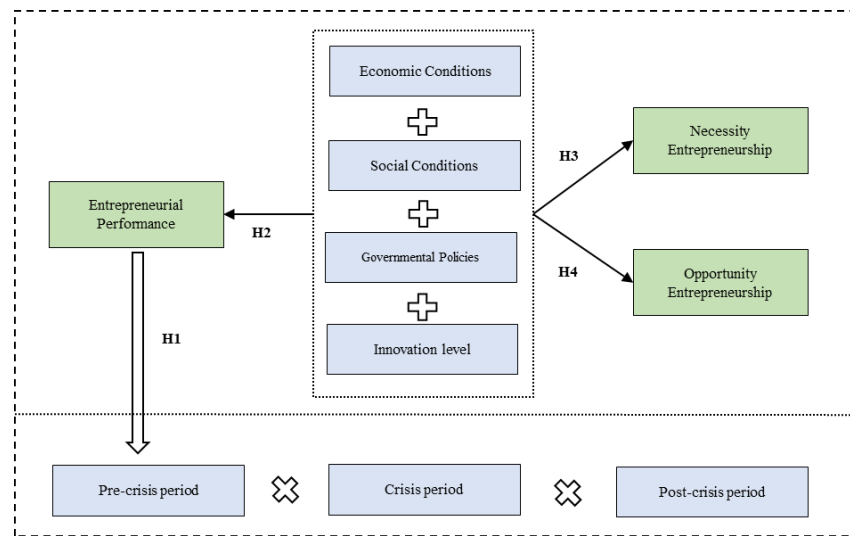
Hypothesis 1: Entrepreneurial performance of EU countries significantly increase during three time periods; pre-2008 crisis, 2008 crisis, post-2008 crisis (Rusu & Roman, 2018; Velilla, 2018; Crescente-Romero et al., 2019).

Hypothesis 2: Economic, social, governmental policies, and innovation conditions have a positive impact on entrepreneurial performance in the EU countries (Acs, 2006; Angulo-Guerrero et al., 2017; Chowdhury et al., 2019).

Hypothesis 3: Economic, social, governmental policies, and innovation conditions have a negative impact on necessity entrepreneurship in the EU countries (Acs & Audretsch, 2010; Rusu & Roman, 2018; Amoros et al., 2019).

Hypothesis 4: Economic, social, governmental policies, and innovation conditions have a positive impact on opportunity entrepreneurship in the EU countries (Angulo-Guerrero et al., 2017; Rusu & Roman, 2018).

Figure 3 - Hypotheses Structure



Source: Created by the author.

Chapter 2 demonstrated the understanding of pertinent ideas associated with the vast areas to consider in this research. Thus, the next chapter provides the scientific foundation to be utilised in the development of this work.

### **3. Literature Review**

This topic can best be treated under four headings:

- the effect that entrepreneurship plays in economic development;
- differences between opportunity and necessity entrepreneurship;
- the EU entrepreneurial panorama;
- and the factors that impact entrepreneurship.

Consequently, the key aspects of entrepreneurship performance can be listed as follows:

1. on the analysis of the development of a competitive economy;
2. two approaches to define entrepreneurship and why are they suitable to define entrepreneurship;
3. strategies and policies focused on this area implemented by the EU during the last years;
4. the most critical dimensions that play a significant role in entrepreneurship and the reason behind it.

Every topic has compared the several taxonomies developed in this field (see Appendix A).

#### **3.1. The Role of Entrepreneurship in Economic Development**

The literature on entrepreneurship tends to focus on the impact it has had on countries' competitiveness (Radulescu et al., 2018; Crescente-Romero et al., 2019). Whilst this remains under discussion, there is still no consensus on the variables which drive entrepreneurship to contribute to a competitive economy (Radulescu et al., 2018). Regarding economic competitiveness, the OECD defines how countries distribute welfare among citizens (Hatzichronoglou, 1996). Thus, it profoundly influences economic policy, as a social welfare theory, strategising a plan of growth and management where productivity forecasts long-term financial success (Aiginger et al., 2013). The definition from the European Commission (2014) is that the level of competitiveness depends on policies that create sustainable economies with high levels of employment, productivity and social unity, for this reason, these must outperform entrepreneurship. On the other hand, for the WEF, a competitive economy affords rising living standards, where everyone benefits and contributes from and to its wealth, while not compromising the needs of future generations (WEF, 2014). Considering the above, it can be said that they all converge on the idea of creating a suitable environment to accomplish economic and sustainable growth (Hatzichronoglou, 1996; Rusu & Dornean, 2019). Similarly, Rusu & Dornean (2019) affirm

that noteworthy factors from competitive European economies are growing business, the macroeconomic environment, and entrepreneurial quality. When ascertaining the sustainable progress of the Europe 2020 strategy, other authors maintain an economies' competitiveness increases with higher investments in R&D and efficient usage of resources, while creating new jobs and improving governmental quality (Rodríguez-Pose & Cataldo, 2015; Radulescu et al., 2018; Varga et al. 2018). Nevertheless, the objective of our study is to evaluate how a country's economic competitiveness is affected with regard to entrepreneurial activity.

Others make known the positive and significant relation between entrepreneurship and innovation, both together and independently (Wennekers & Thurik, 1999; Valliere & Peterson, 2009; Bashir & Akhtar, 2016; Chowdhury et al., 2019). Velilla (2018) evidences the capability to innovate and the unrecognised local aptitude, which are the most active elements of the entrepreneurial performance. Yet, Content et al. (2019) highlight innovation as the result of recombinations of different pieces of knowledge. Likewise, innovative entrepreneurs prosper in market efficiency and institutions with higher government quality (Rodríguez-Pose & Cataldo, 2015; Bosma et al., 2018). Nevertheless, they will pursue opportunities despite these conditions (Alia et al., 2019).

Scholars and policymakers have endorsed entrepreneurship as an economic grounding (Angulo-Guerrero et al., 2017). Consequently, promoting policies are essential (Tominc, 2019). Nevertheless, because of the tense relationship between institutions and entrepreneurship, the above chain effect is difficult to achieve (Chowdhury et al., 2019).

The outcome of discussions on entrepreneurship with several interactions between internal and external factors, then create a complex ecosystem, which is related to market opportunities filled with innovative ideas (Alia et al., 2019; Hechavarría & Ingram, 2019; Seguí-Mas et al., 2019). With this reasoning, the literature has concentrated more on numbering the factors that have had a significant influence on entrepreneurial activity and the motivations amongst countries or groups of countries, as indicated by GDP, government policies, education, unemployment, and others (Acs & Audretsch, 2010; Gabor, 2018; Roman et al., 2018; Rusu & Roman, 2018; Varga et al., 2018; Chowdhury et al., 2019).

To sum up, the literature provides attempts in understanding of how entrepreneurship affects an economy, whether it is from the improvement of its competitiveness level or by the growing effect that innovation places on economic growth. However, it is crucial to have policies that prompt these effects.

### **3.2. Opportunity versus Necessity Entrepreneurship**

It is worth to differentiating the motivations for becoming an entrepreneur (Angulo-Guerrero et al., 2017; Amoros et al., 2019). Each entrepreneur responds differently to the environment, whereas some individuals react to an alleged market opportunity, others involuntarily perceive more favourable conditions through the creation of businesses (Acs et al., 2013; Zwan et al., 2016; Content et al., 2019). The percentage of those involved in TEA divides into these two types of entrepreneurs (Bosma & Kelley, 2019).

On the one hand, opportunity-driven entrepreneurship occurs whenever an individual implements a new business to exploit opportunities (Bashir & Akhtar, 2016; Zwan et al., 2016; Amoros et al., 2019). This type of entrepreneurship is the most common in economies as there is a higher probability of causing employment growth, since it exploits market opportunities, created by spillovers (Reynolds, 1999; Bosma & Kelley, 2019; Content et al., 2019). On the other hand, necessity-driven entrepreneurship is when individuals implement businesses due to a lack of other employment opportunities (Angulo-Guerrero et al., 2017; Content et al., 2019). Additionally, this business environment is frequently small and less productive creating fewer new jobs (Reynolds et al., 2001; Content et al., 2019). Economies dominated by necessity entrepreneurship should adopt policies which educate entrepreneurs to the possible influencing economic potential they have to develop their regions (Bashir & Akhtar, 2016).

The evidence from GEM suggests both these purposes are the foundation of entrepreneurship (Reynolds et al., 1999; Reynolds et al., 2001; Arenius & Minniti, 2005; Acs et al., 2013). To this end, were used both approaches provided by GEM (2019) on OPP and NEC, as indicators of the total entrepreneurial activity among european countries. Studies made about the relative levels of entrepreneurship tend to use only TEA rate as a measure (Freytag & Thurik, 2007; Hechavarría & Ingram, 2019). Nevertheless, high values of entrepreneurial activity do not inevitably prompt positive economic outcomes (Amoros et al., 2019). Although Baumol (1990) suggests that whilst entrepreneurial activities differ, they do not all have a positive economic effect.

Moreover, entrepreneurs, as economic agents who diversify the market, ought to foster employment growth relevant to the type of entrepreneurship predominant in his or her region (Content et al., 2019). For necessity entrepreneurs, both the countries' economic development and its total tax rate influence entrepreneurial motivations. While for the other type of entrepreneurs, what influences entrepreneurship are unemployment rates, inflation rates and access to financial resources (Rusu & Roman, 2018). Bjørnskov and Foss (2008)

found that the principal features of the welfare state, namely, robust relocation by public goods, governmental consumption, regressive transfer and high marginal taxes, are significantly negative when associated with OPP. Additionally, the size of the government can be negatively associated with OPP and its growth (Bosma et al., 2018). By examining the relationship between innovative entrepreneurship and economic growth of the G20 member countries, Bashir and Akhtar (2016) have demonstrated NEC to be higher for countries in the efficiency-driven phase (or transiting to the innovation-driven phase), relative to innovation-driven economies.

Subsequently, measures to improve necessity entrepreneurship does not unavoidably benefit opportunity-driven entrepreneurs, and contrariwise, intrinsically, there are significant implications for policymakers to consider (Zwan et al., 2016). Furthermore, in the policies' empirical foundations in supporting entrepreneurship, importance should consider when going through rates of entrepreneurial efforts and also elucidating the factors from different types of the entrepreneurial performance (Reynolds et al., 2001; Amoros et al., 2019).

Ultimately, countries' economic conditions and entrepreneurs' perceptions are determining factors to drive entrepreneurship, in the EU countries (Rusu & Roman, 2018).

In conclusion, this section differentiates the motivations of becoming an entrepreneur, whilst explaining the reason behind their relevance to entrepreneurship. Thus, depending on the variables, there are differences in the ones that affect each motivation.

### **3.3. Entrepreneurship in the EU**

Concerning EU countries, several authors found entrepreneurship to be considered essential amongst the European governments in generating economic growth and employment (Gabor, 2018; Radulescu et al., 2018; Teixeira et al., 2018; Varga et al., 2018).

Since 2008, the EU has suffered the most grievous economic and financial crises. The level of unemployment reached, over 25 million people, and most Member States' SME have still not been able to reach their pre-crisis levels (European Commission, 2019). Additionally, the stock market has suffered a global breakdown by the fourth quarter of 2008; therefore, the Euro-crisis considers to be ranged from the 16<sup>th</sup> December of 2008 to the 13<sup>th</sup> January of 2013 (Alexandridis & Hasan, 2019). However, before 2008, the EU economy had already been facing structural challenges in terms of its competitiveness, growth and entrepreneurship (Popovici & Călin, 2012). Therefore, the crisis was a catalyst

for reforms (Varga et al., 2018). Supposedly, reallocation enhances productivity (Baumol, 1990). Therefore, firms had grown, while the less productive ones should retract or leave the market (Bosma et al., 2018). The above is only valid for the pre-crisis period, from 2002 to 2007. Once the crisis was entrenched, productivity intensified, resulting in older firms, which were often less productive, losing most jobs (OECD, 2015). The financial and economic crisis increased the vital role of entrepreneurship in the development and economic recovery (Velilla, 2018). In this scenario, characterised by economic stagnation and structural unemployment, EU authorities played a crucial role to create effective policies and to prevent corruption (Rodríguez-Pose & Cataldo, 2015). It is with this view that the European Commission created the 2020 Strategy by establishing the essentials to achieve future growth and competitiveness (Radulescu et al., 2018; Teixeira et al., 2018).

In the institutions, entrepreneurship and economic growth in EU, it has been proved that 25 EU economies should be guided towards growth, opportunity-driven and general independent entrepreneurial activities (Bosma et al., 2018). In terms of investment in R&D, knowledge generation and the diffusion of innovation, the EU has delayed when compared to its biggest competitors, which has generated deceleration in productivity (Stel et al., 2019). Similarly, the results from the study of Teixeira et al. (2018), concluded that EU authorities should formulate public policies to prepare individuals for challenges of new businesses. Hence, Bashir and Akhtar (2016) understand there to be a negative correlation between innovation and entrepreneurship in G20 countries because some economies are behind the innovative entrepreneurship average.

Various sectoral policies are vital to entrepreneurship to shape economies (Valliere & Peterson, 2009; Angulo-Guerrero et al., 2017; Tominc, 2019). What is more, competency of entrepreneurship differs amongst the EU member countries; firms with higher entrepreneurial performance are less likely to help growing new and minor enterprises (Wennekers & Thurik, 1999; Wennekers et al., 2010; Gabor, 2018; Rusu & Dornean, 2019). Implementing new businesses generates wealth, improves productivity and employment (Wennekers & Thurik, 1999; Zwan et al., 2016; Radulescu et al., 2018). New firms create more than 4 million jobs every year in EU, yet, this level has stabilised.

The number of individuals preferring self-employment, to being an employee, has decreased since 2004, from 27 to 23 in the EU countries (European Commission, 2019). Aspiring EU entrepreneurs lack business acumen with which to develop an entrepreneurial career (Chowdhury et al., 2019). Entrepreneurs find access to credit difficult; they also fear

penal sanctions in case of failure and suffer pressure from financial institutions and the banking sector (Radulescu et al., 2018).

Finally, the EU has been struggling to implement the right policies that are adequate for improving entrepreneurial performance. A pivotal moment to analyse this relation is during the past economic and financial crisis, where the EU countries seem to have changed their profile, according to the 2020 Strategy.

### **3.4. Influencing Factors in Entrepreneurship**

Several factors influence entrepreneurship, such as education, macroeconomic environment, state fragility, and the labour market (Amoros et al., 2019; Crescente-Romero et al., 2019; Seguí-Mas et al., 2019). Policies are acknowledged to effect entrepreneurial performance profoundly, yet there is no linkage to entrepreneurial determinants or even to governmental intervention of entrepreneurship in economic progression (Grilo & Thurik, 2004). The integration and support of government policies show interest in innovation; in fact, ineffective and corrupt governments epitomise the obstacle for the modernisation of the poorer nation states of EU (Rodríguez-Pose & Cataldo, 2015). GEM only estimates general governmental priorities on entrepreneurship, as it does not measure specific policies (Hechavarría & Ingram, 2019). Innovation-driven economies have been promoting policies for new businesses, because of this need (Angulo-Guerrero et al., 2017).

Active economic, political, and legal incentive structures all contribute to reaching productive entrepreneurship (Baumol, 1990; Stel et al., 2019). Chowdhury et al. (2019) have proved that differential economic growth and quality of formal and informal institutions should present different marginal effects on entrepreneurial quality and quantity. Likewise, it permits to understand the influence that external conditions have on market-driven entrepreneurship, which is composed of opportunities and innovation (Bosma et al., 2018; Alia et al., 2019).

Elements of the macroeconomic entrepreneurial performance are inflation rate, FDI, access to finance and total tax rate. And variables from individual businesses which present a significant effect on TEA rate (Rusu & Roman, 2017). What Rusu and Roman (2018) call perceptual indicators are fear of failure, entrepreneurial intentions, perceived capabilities, and opportunities, which present a significant effect on entrepreneurship according to entrepreneurs' motivation. Furthermore, Teixeira et al. (2018) showed that psychological,



environmental, sociodemographic and training factors, were more important than social, political, cultural, economic and infrastructural elements.

Contrarily, several studies have associated entrepreneurial activity with GDP. On the one hand, some affirm to have a negative influence between GDP per capita and entrepreneurial activity, despite its importance on economic growth; on average there is a decrease with the level of income (Bjornnskov & Foss, 2008; Radulescu et al., 2018). On the other hand, others believe in the positive and significant link between the opportunity ratio and GDP per capita (Acs, 2006; Popovici & Călin, 2012; Bashir & Abdul, 2016). Bosma et al. (2018) proved a positive relationship between institutional variables and the growth of GDP per capita, which works through all types of entrepreneurial activity. Hence, GDP per capita and innovation-driven entrepreneurship being a percentage of TEA rate, as opportunity is the driving force, there was found a positive correlation among those two variables (Bashir & Abdul, 2016). Thus, it is this variable along with public policies and employment rates that measure outcome competitiveness (Wennekers & Thurik, 1999; Wennekers et al., 2010; Popovici & Călin, 2012; Crescente-Romero et al., 2019)

Recent evidence on the need for entrepreneurial research has claimed that public capital invested in primary research accrues significant spillovers on innovation and on patents (Acs, 2013; OECD, 2015; Content et al., 2019). Likewise, regions with more knowledge spillovers, present higher levels of entrepreneurial activity, and consequently, more employment growth (Rodríguez-Pose & Cataldo, 2015; Content et al., 2019).

Hechavarría and Ingram (2019) found a positive effect on education, through entrepreneurial programs, which propels entrepreneurs, by improving the individual's ability to recognise, access and explore an opportunity. A study evinced that opportunity and necessity entrepreneurs have comparable education (Rusu & Roman, 2017).

The entrepreneurial theory of knowledge spillover demonstrates that knowledge increases through information, rather than economic goods (Acs et al., 2005), since self-awareness is essential to recognise opportunities; particularly in modern education unexploited by start-ups (Crescente-Romero et al., 2019; Hechavarría & Ingram, 2019). Predominantly for necessity motivated entrepreneurs, there is a higher probability of being risk-averse (Bjornnskov & Foss, 2008). Thus, in the long term, generating creativity, risk-taking (tolerating failure), will result in monetary benefits (OECD, 2015).

Government programs have been shown an essential impact on entrepreneurial performance (Bjørnskov and Foss, 2008; Rodríguez-Pose & Cataldo, 2015; Gabor, 2018; Radulescu et al., 2018; Roman et al., 2018; Teixeira et al., 2018; Varga et al., 2018;

Chowdhury et al., 2019). Government programs, such as accountants, bankers, lawyers, and business consultants, can foster entrepreneurial capacity across economies, by minimising transaction costs for organisations and improving human capital (Crescente-Romero et al., 2019; Hechavarría & Ingram, 2019).

The effects FDI inflows may have on the total entrepreneurship rate are both positive and negative, while necessity-driven economies impact FDI negatively, OPP increases with a greater inward flow of FDI, as new investors appear (Rusu & Roman, 2017).

Rusu and Dornean (2019) recognise a significantly positive association between innovation rate, inflation rate, FDI and economic competitiveness. Besides this, there is a negative relation on expectations concerning job creation, tax rate, costs and competitiveness (Rusu & Dornean, 2019). The solidity of the financial system is positively related to the source of OPP (Bosma et al., 2018).

Finally, the above has introduced the work's specific theme -influencing factors in entrepreneurship - where the main elements that influence entrepreneurial performance are discussed, by debating the principal researches and its critics on this problematic theme. Therefore, the literature review comes to an end. In the next section, we move towards the methods, where the study's main question and objectives are answered and achieved.

#### **4. Methodology and Data Collection**

A method is a systematic and rational construction of steps, which will safeguard efforts and permit the production of accurate and valid concepts (Vergara, 2015; Matias-Pereira, 2016; Marconi & Lakatos, 2017). Therefore, with the view of supporting the decision-making of the researcher, the methodology will help to understand the strategies followed to achieve the objectives of this study (Martins & Theóphilo, 2016; Richardson, 2017), which is the analyses of socioeconomic, governmental and innovative effects on entrepreneurship performance, OPP and NEC, from EU countries, between 2003 and 2018. As well as answering the central question of this research: how could socioeconomic, governmental and innovative conditions influence the performance of entrepreneurship in the EU countries?

This chapter is essential, as the linkage between the analysis of the references used in the literature review, which is the foundation of any social or physical phenomenon (Marconi & Lakatos, 2017). Along with the approach of research methods, procedures and techniques, through a detailed process, a broad planning of scientific research and the execution of ethical patterns, it will be established with the necessary scientific rigour to serve as the foundation of the interpretation of reality (Cooper & Schindler, 2011).

##### **4.1. Type of Research**

The first stage of the methodological work is to define the aim of the scientific study, whether is it exploratory, descriptive, predictive, explanatory, or action (Matias-Pereira, 2016). Moreover, this study can be defined as descriptive, since it pursues the systematic description of a determined phenomenon that describes it as an integral system, and then differentiates it from another (Richardson, 2017), by examining the pivotal variables that describe entrepreneurship performance.

Additionally, the second stage is to explain the means of the type of research, which can be quantitative, qualitative, or mixed (Martins & Theófilo, 2016). This research has developed a quantitative approach through statistical analysis.

Statistical processes simplify representations that are social, political, economic. They are reduced and manipulated in quantitative matters to obtain their relationship and rational description of the method (Marconi & Lakatos, 2017). Through these means, the objectives of the research are tested, and the information on the chosen variables examined in numerical terms and data is compared using the adequate statistical techniques (Richardson, 2017).

## 4.2. Data and Sample Collection

This process of data and sample collection is organised into secondary data. Secondary data is directly accessible and organised for the researcher (see Cooper & Schindler, 2011). This type of information is available through literature review, document, and data research (Richardson, 2017). Both literature review and document analysis have given guiding constructs to the study and a theoretical consensus for the chosen variables (Vergara, 2015).

The group of gross factors covered 448 observations for the 28 EU Members of a period of 2003 to 2018. This data had to be filtered, as there were non-rating variables for the period studied. After this, institutions and labour market efficiency were eliminated, as they are only graded from 2007 to 2017, along with national patent's growth covering the period from 2003 to 2013. Additionally, market size in The World Bank has information only from 2007 to 2017. This variable was calculated as the natural logarithm of the sum of GDP, imports, and exports, to proceed with the rating, using Microsoft Excel 2016. Therefore, through the elimination of missing factors, 336 observations were provided for 21 EU Members.

Both NEC and OPP have data available only from 2013 to 2018. What is more, the countries that had to be eliminated, due to missing data on TEA, were Bulgaria, Cyprus, Czech Republic, Estonia, Lithuania, Luxembourg, and Malta. For the countries that were missing less than half of the years studied, TEA's mean was calculated.

On the one hand, there were cases where the missing value was in-between years; in these cases, the average was between the year before and the one after, divided by two. On the other hand, when there were consecutive years that missed values, the value has been replaced by TEA's mean value (see Appendix B). Table 1, presented in the subsequent page, shows the dimensions for each variable.

Independent variable is the determinant factor that influences another variable, to cause a determinate result (Marconi & Lakatos, 2017). The independent variables in this study are GDP, unemployment, macroeconomic environment, financial environment, FDI, market size, age, female, male, education, population, fiscal incentives, government programs, government expenditures, R&D, technological development, competitiveness and innovation. On the other hand, the dependent variable is the one phenomenon to be explained, in the virtue of being influenced by the independent variable (Marconi & Lakatos, 2017). The dependent variables in this study are TEA, OPP and NEC.

To successfully achieve the research objective, the sample must be understood, through its variation and distribution, done through descriptive statistics (Fávero & Belfiore, 2017).

Furthermore, for the data organisation, the program Microsoft Excel 2016 was used, with the objective of preparing and synthesising the variables. Following this, the descriptive statistics were achieved. To execute the analysis of correlation and regression analysis, the software IBM SPSS Statistics v.26 was used, so that data could be standardised to achieve more advanced statistics.

Table 1 – Dimensions and Variables

Dimensions	Variables
Entrepreneurship	TEA NEC OPP
Economic	GDP pc Unemployment Macroeconomic Environment Financial Environment FDI Market Size
Social	Age Female Male Education Population
Governmental Policies	Fiscal Incentives Government Programs Government Expenditures
Innovation Level	R&D Technological Development Competitiveness Innovation

Source: Created by the author.

Reports made on the GDP growth and the trading stock of the EU shares, has stated that the European financial and economic crisis was from 2008 to 2013 (Reuters, 2020; The World Bank, 2020). The trend started in the final quarter of 2007, reaching its peak in 2008 while having a slight recovery in 2010, then there was a slight decline from the first quarter of 2011 until 2013 (Reuters, 2020; The World Bank, 2020). The chosen period of study intends to reflect five years before and after the crisis. Therefore, the period of this study is from 2003 to 2018.

The following table will demonstrate the logical procedure used to determine and define the dimensions and variables under study (see Appendix C for more detailed information).

In table 2, in the next page, the dimensions are grouping the variables in terms of the concepts from the data sources. Within these, are represented the variables that should influence entrepreneurship, according to the literature review in this study. Thus, the definitions provided are from data sources. Note that both the macroeconomic environment and market size are the result of the sum of the underneath variables. Please see Appendices C and D for a summary of the references used for the variables collection and its codebook.

## Entrepreneurship Performance and Influencing Factors in the EU

Table 2 - Definition of Dimensions and Variables

Dimensions	Variables	Definition	Data Source	Measurement	
Entrepreneurship	TEA	Population who are either a nascent entrepreneur or owner-manager of a new business	GEM	Percentual	
	NEC	Percentage of those involved in TEA who are involved in entrepreneurship because they had no better options for work	GEM	Percentual	
	OPP	Population who see good opportunities to start a firm in the area where they live	GEM	Percentual	
Economic	GDP	Gross domestic product at current prices per capita	EUROSTAT	Numerical	
	Unemployment	Unemployment by sex and age	EUROSTAT	Percentual	
	<b>Macroeconomic Environment</b>				
	Government Current Account Balance	The record of all transactions in the balance of payments	IMF	Percentual	
	Gross National Savings	National accounts data on gross domestic investment and from the balance of payments-based data on net foreign investment	IMF	Percentual	
	Consumer Price Inflation	Inflation, consumer prices (annual %)	The World Bank	Percentual	
	Government Gross Debt to GDP	Debt is the entire stock of direct government fixed-term contractual obligations to others outstanding on a particular date. It includes domestic and foreign liabilities such as currency and money deposits, securities other than shares, and loans	IMF	Percentual	
	Financial Environment	A cyclically adjusted total expenditure of general government	AMECO	Percentual	
	FDI	Foreign direct investment, net inflows (% of GDP)	The World Bank	Percentual	
	<b>Market Size</b>				
	Imports	Imports of goods and services (% of GDP)	EUROSTAT	Percentual	
Exports	Exports of goods and services (% of GDP)	EUROSTAT	Percentual		
Social	Age	Resident population: median age	PORDATA	Numerical	
	Female	Active population by sex	EUROSTAT	Numerical	
	Male	Active population by sex	EUROSTAT	Numerical	
	Education	Population by educational attainment level, sex and age (%)	EUROSTAT	Percentual	
	Population	Country Population	AMECO	Numerical	
Governmental Policies	Fiscal Incentives	Main national accounts tax aggregates per capita	EUROSTAT	Numerical	
	Government Programs	The presence and quality of programs directly assisting SMEs at all levels of government (national, regional, municipal)	GEM	Percentual	
	Government Expenditures	Government Budget Appropriations or Outlays on R&D	EUROSTAT	Percentual	

## Entrepreneurship Performance and Influencing Factors in the EU

Dimensions	Variables	Definition	Data Source	Measurement
Innovation Level	R&D	Total R&D personnel and researchers by sectors of performance, as % of total labour force and total employment, and by sex	EUROSTAT	Percentual
	Technological Development	High-tech trade by high-tech group of products in a million euros	EUROSTAT	Numerical
	Competitiveness	Global Competitiveness Index	The World Bank	Percentual
	Innovation	Private investments, jobs and gross value added related to circular economy sectors	EUROSTAT	Numerical

Source: Created by the author.

Furthermore, to filter the dataset to analyse this study, there was a multicollinearity analysis. The variables that scored more than 0.7 in this test were changed or eliminated. To avoid multicollinearity, the market size was removed due to the high correlation between imports and exports; female and male was transformed to a ratio, the gender ratio; fiscal incentives, technological development, competitiveness, and innovation were eliminated. Although R&D has a high correlation with GDP, it was decided to maintain that variable, so that the dimension of innovation level remains. The previous modifications are shown in table 3. Please see Appendix D for the multicollinearity analysis made.

Table 3 - Filtered Dimensions and Variables

Dimensions	Variables
Entrepreneurship	A - TEA B - NEC C - OPP
Economic	D - GDP pc E - Unemployment F - Macroeconomic Environment G - Financial Environment H - FDI
Social	I - Age J - Gender Ratio K - Education L - Population
Governmental Policies	M - Government Programs N - Government Expenditures
Innovation Level	O - R&D

Source: Created by the author.

Equations were created to produce the regressions and to analyse the hypotheses mentioned. The variables and dimensions represent the inputs, outputs and outcomes of the entrepreneurial performance in the EU countries from 2003 to 2018, with possible relationships between them. As mentioned before, entrepreneurial performance as measured

by TEA, NEC and OPP are dependent variables, and the remaining variables are independent. Please refer to table 3 to understand the variables used on the equations.

The first equation aims to understand the cause-effect from socioeconomic and governmental policies variables in entrepreneurial performance by multiple regression analysis.

$$A = \beta_0 + \beta_D + \beta_E + \beta_F + \beta_G + \beta_H + \beta_I + \beta_J + \beta_K + \beta_L + \beta_M + \beta_N + \epsilon \quad (1)$$

Additionally, the second equation demonstrates the impact of the variables of socioeconomic and governmental policies dimensions to NEC.

$$B = \beta_0 + \beta_D + \beta_E + \beta_F + \beta_G + \beta_H + \beta_I + \beta_J + \beta_K + \beta_L + \beta_M + \beta_N + \epsilon \quad (2)$$

The third equation explains how socioeconomic and governmental policies variables influence opportunity entrepreneurship.

$$C = \beta_0 + \beta_D + \beta_E + \beta_F + \beta_G + \beta_H + \beta_I + \beta_J + \beta_K + \beta_L + \beta_M + \beta_N + \epsilon \quad (3)$$

The following equation illustrates the capacity of the innovation level dimension to impact TEA. Likewise, through linear regression analysis, it was able to compare the ability from this dimension with the others on entrepreneurial performance.

$$A = \beta_0 + \beta_O + \epsilon \quad (4)$$

The equation below is the attempt to explain the impact of innovation on necessity entrepreneurship, achieved through linear regression analysis.

$$B = \beta_0 + \beta_O + \epsilon \quad (5)$$

Lastly, the linear regression analysis studies the effects of the innovation level dimension on opportunity entrepreneurship.

$$C = \beta_0 + \beta_O + \epsilon \quad (6)$$

### 4.3. Statistical Analysis

The first quantitative analysis used was descriptive statistics, which aim to succinctly interpret the study's evidence in the forms of percentages, means, or tables (Rendón-Macías et al., 2016). This data summary is vital to comprehend the multivariate analysis that



highlights the behaviour of different variables, as it describes the quantitative data of the sample and the measures of central tendency and dispersion (Mishra et al., 2019).

The measure of central tendency used was the mean, that is, every value summed and divided by the total, highlights the skewness of the mean through extreme values (outliers) (Nimon et al., 2017).

The dispersion analysis used in this study was the ANOVA test, where the higher the value, the more distant the variable is from the mean (Nimon et al., 2017). This analysis is to measure the statistical significance of differences on the mean values from different scoring groups. If there is a significant difference it means that the difference is likely to show in repeated studies (Tabachnick & Fidell, 2007). Moreover, graphs are used to visualise the ANOVA model (Stahle & Wold, 1989).

Following of the evaluation of the strength of the dimensions' relationships, a correlation analysis was used (Fávero & Belfiore, 2017). Moreover, this statistical method provided a numerical summary of the strength of associations from the available statistical data (Corrar et al., 2007) A high correlation signifies that two or more variables have a strong relationship with each other. In contrast, a weak correlation means that the variables are not closely related (Lattin et al., 2011). Through the Pearson Coefficient, we recognise the relationship between the indicators (Hair Jr. et al., 2009).

Lastly, a multiple linear regression analysis was used to evaluate the effect of the dimensions into entrepreneurial performance, OPP and NEC. This analysis provides the possible explanation of the model by the indicators, and by the association of the dependent and independent variables (Arthur et al., 2017).

#### **4.4. Methodological Synthesis**

Figure 4 presents the steps the development of this study:

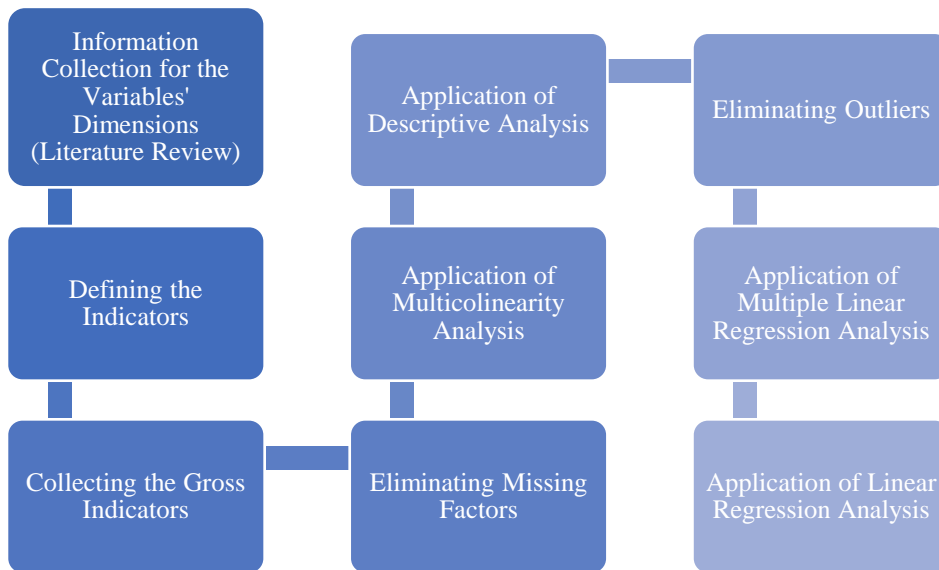
1 – Firstly, information was collected to define the dimensions that compose the variables, as shown by the literature review in the preceding chapter;

2 – Following this, with the theoretical basis on the influencing factors in entrepreneurial performance, the indicators were defined, as shown in table 3;

3 – The results were catalogued and the dimensions set, from the databases described in the codebook in Appendix C;

4 – The elimination of the missing factors proceeded to achieve an accurate analysis; the missing factors being the countries with a lack of data in regards to TEA and the variables which were missing a significant number of years;

Figure 4 - Methodological Synthesis



Source: Created by the author.

5 – To satisfy the assumption of no multicollinearity from multiple linear regression, it was proved that both the independent and dependent variables, respectively, are not highly correlated with each other;

6 – Subsequently, a descriptive analysis of the filtered data was produced;

7 – Thereafter, in the collection of the variables and to ensure the assumption of multivariate normality from the multiple regression, data analysis was carried out in search of outliers, to assure that residual values were normally distributed;

8 – The multiple linear regression was led;

9 – Finally, a linear regression analysis was conducted with the variable R&D.

This chapter has presented the research path with the comprehension of the techniques and procedures applied during the research. The following chapter will show the results from using such methods and discuss these from the literature. The results are the values gathered from the methods here described, whereas the discussion will compare these results with the literature from this study.

## 5. Results and Discussion

This chapter presents the main findings from the research on this theme, whilst linking these with previous studies. It is divided according to the hypothesis which better presents the results obtained (descriptive analysis, ANOVA analysis linked with hypothesis 1, correlation analysis and regression analysis, linked with hypotheses 2, 3 and 4).

### 5.1. Descriptive Analysis

To describe the characteristics of entrepreneurial performance, and subsequent motivations in a temporal manner.

This section has been divided into the headings of:

- general descriptive statistics, examining the values of TEA, NEC, OPP, and the independent variables,
- variables evolution per year, which points out the temporal characteristic from this progress.

#### 5.1.1. General Descriptive Statistics

The table below presents the most common variables of the descriptive statistics, minimum, maximum, mean, and standard deviation (SD) values, grouped into each dimension from the variables analysed.

Table 4 - Descriptive Statistics

<i>Variables</i>	<i>Min.</i>	<i>Max.</i>	<i>Mean</i>	<i>SD</i>
<b>Dependent Variables</b>				
TEA	1.63	14.20	6.72	2.44
NEC	0.06	0.25	0.13	0.05
OPP	0.61	1.36	0.94	0.12
<b>Independent Variables</b>				
GDP pc	11.7	221.1	100.38	50.50
Unemployment	3.4	27.5	9.18	4.46
Macroeconomic Environment	13.63	191.53	90.65	31.63
Financial Environment	28.43	62.36	46.66	6.07
FDI	-46.77	86.61	5.32	11.20
Age	33.0	46.3	40.50	2.45
Gender Ratio	65.44	102.23	85.16	7.00
Education	24.3	86.5	70.69	11.79
Population	1,233.18	55,595.92	15,115.33	15,999.77
Government Programs	1.72	3.75	2,7580	0.48
Government Expenditure	0.35	2.10	1,2147	0.42
R&D	0.43	3.13	1.60	0.70

Source: Created by the author.

Entrepreneurial performance is measured by TEA, ranged from 1.63 to 14.20 percent, with a mean of 6.72. Very similar values were found in the study from Rusu and Roman (2017), where these are explained as differences in macroeconomic circumstances, those which impact entrepreneurship, such as regulatory aspects of registering a business and the ease with which this can be done. Within the dimension of entrepreneurship, TEA presents the highest values, compared to NEC with the lowest ones. According to Crescente-Romero et al. (2019), economies in recovery enhance strategic opportunities, and diminishes the number of necessity entrepreneurs, which explains these values.

The economic dimension reveals that the financial environment presents the highest minimum value and FDI the lowest one. GDP is distributed between 11.7 (in Romania, in 2003) and 221.1 (in Ireland, in 2018). Thus, GDP has the most significant average and variation amounts. Unemployment has the least SD, in contrast with FDI with its mean value. These results prove the diversity of the economic development amongst the EU countries, resulting in an essential macroeconomic panorama (Rusu & Dornean, 2019). The value of the variation of the financial environment translates to significant differences existing in the EU countries regarding their degree of financial development (Rusu & Roman, 2018).

Population stands out with the highest values. Regarding the social dimension, education has the lowest minimum in Portugal, in 2003, and its maximum value is recorded in Poland, in 2018. The peak age for entrepreneurs is 46 years old; the same variable has the lowest mean and variation. The higher a country's population, the more individuals are likely to be active in the labour force, which then influences entrepreneurial performance, along with education, by offering practical skills to implement businesses (Hechavarría & Ingram, 2019). Moreover, age may also pose an unfortunate hindrance because of diminished chances of funding (Tominc, 2019).

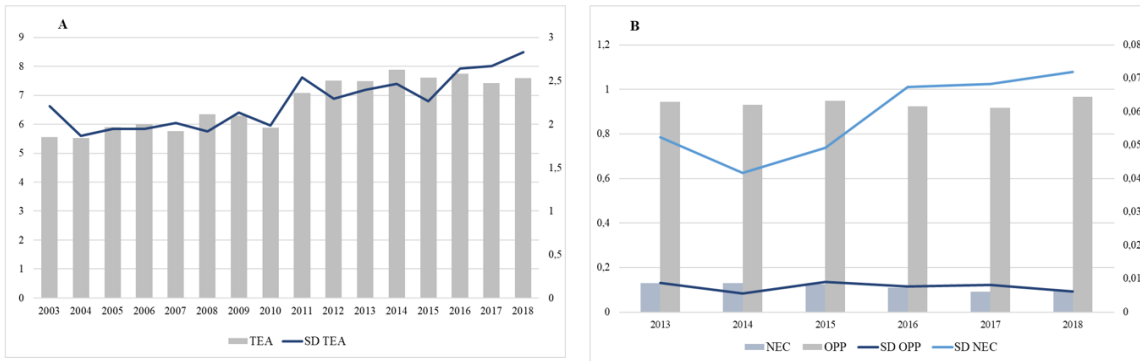
As for governmental policies dimension, represented by government programs and its expenditures; the first one presents the higher amounts, while the second one the lower values. Furthermore, the Europe 2020 strategy states that governments need to improve and increase innovation through constant investments in programmes that create businesses, and to implement into their budget, knowledge generation expenses, such as R&D (WEF, 2014).

The most stable dimension from the ones being considered in the present study is entrepreneurship. These results are similar to those reported by Rusu and Roman (2018), where entrepreneurial intentions was the variable with the lowest SD.

**5.1.2. Variables Evolution**

In this section, graphs will be shown from the mean and standard deviation of the descriptive statistics from 2003 to 2018 in the 21 countries of the EU.

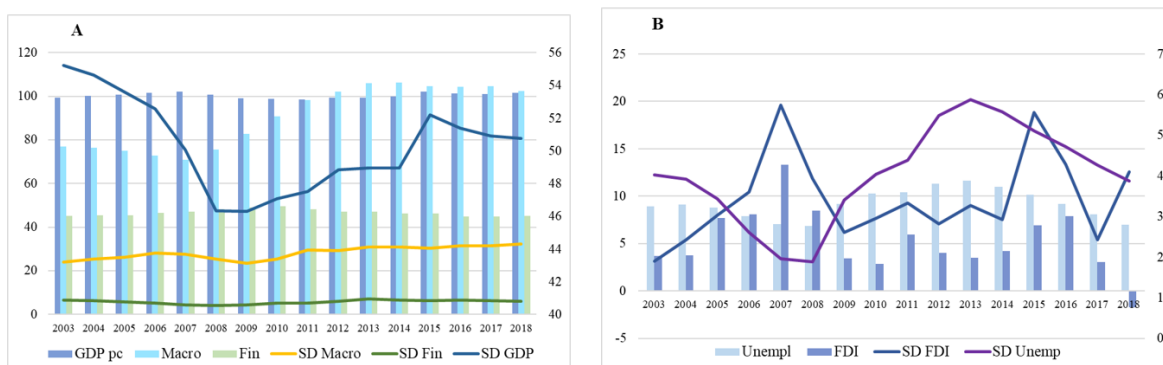
Figure 5 - Mean and SD: Entrepreneurship Dimension



Source: Created by the author.

The entrepreneurial dimension represented in figures 5A and 5B reveal an increase in entrepreneurial performance and opportunity-driven entrepreneurship, in contrast to a slight decrease for necessity-driven. From 2010 to 2011 a significant improvement can be observed in the mean and SD of TEA; an improvement in the mean value, compared to a decreased in the SD in 2012 and in 2013 the sustainment of the average amount and the growth of standard deviation (fig. 5A). From 2015 there is the progress of SD for TEA and OPP, with a slight rise in the mean value in that year, producing inequalities. However, NEC reveals the opposite tendency (fig. 5B). Rusu and Roman (2018) described the rate of all these dependent variables as likely to grow by considerable variations across economies.

Figure 6 - Mean and SD: Economic Dimension



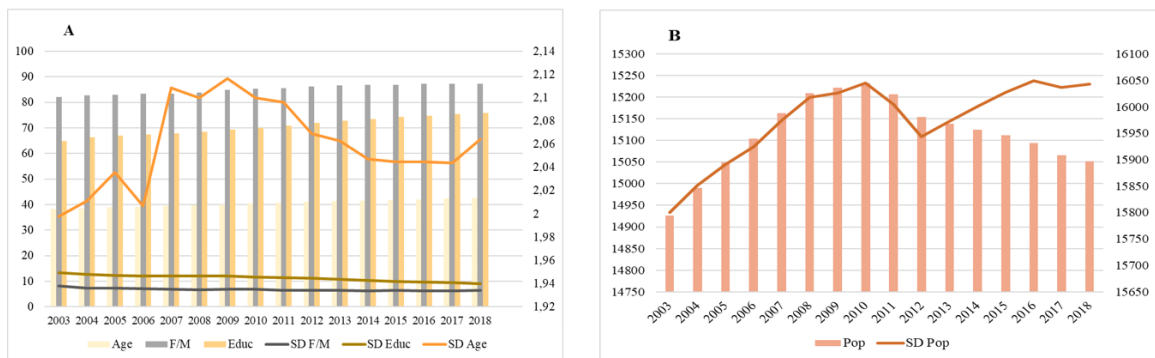
Source: Created by the author.

Regarding the economic dimension, figure 6A illustrates how GDP's standard deviation decreased highly from 2003 until 2008, stabilising for one year, with recovery up by 2012,

steadying once more till 2014, growing until the next year before declining again until 2018. A likely explanation for the high amounts of variation in GDP and unemployment rates is that there have been essential changes between EU countries regarding their financial expansion (Rusu & Roman, 2017). Additionally, the SD of the macroeconomic environment is stable with a small decline in 2009 (23.63) (fig. 6A). The financial environment remained stable having the highest average in 2010 (49.70), and SD's in 2013 (7.27) (fig. 6A).

FDI SD rose to a high point, reaching a peak in 2007 (19.62), being higher than the mean values, alongside with the significant recovery of unemployment from 2007 till 2013 (1.96-5.88). This describes a high variance of the FDI and unemployment variables (fig. 6B). Concerning the mean, both variables are volatile, reaching the highest amount in 2007 and 2013, respectively for FDI and unemployment, and the lowest in 2018 for both of them. Likewise, a possible explanation for this might be that economic development was dependent on the amount of capital, then driving improved entrepreneurial opportunities. Also, the negative value from FDI suggests the outflows surpassed the inflows from the EU countries (Rusu & Roman, 2017).

Figure 7 - Mean and SD: Social Dimension

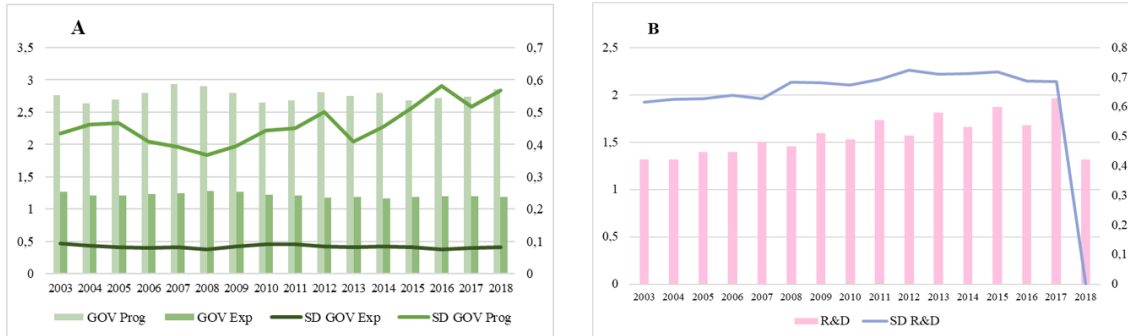


Source: Created by the author.

What can be clearly seen in figure 7A from the social dimension is the decline in age's SD in 2006 (2.01), followed by a dramatic increase in 2007 and a gradual decline over the next eleven years. Population's SD rose from 2003 to 2010, there was a slight dip in 2012, but has been recovering ever since (fig. 7B) . From 2013, the SD's value was higher than the mean, demonstrating a significant inequality, explained by the diverse dimensions amongst the EU countries. Having a positive relationship on entrepreneurial activity amongst the working-age population, means that there is a higher likelihood for people to plan to create a business and for entrepreneurship to increase in the future (Rusu & Roman, 2018). Moreover, Crescente-Romero et al. (2019) argue that the progress of entrepreneurship is

significantly linked with population density, high growth rates of population, a top fraction of qualified workers, and a robust formation for SMEs. Consequently, the graph shows that there has been a steady growth in the other variables (fig. 7A).

Figure 8 - Mean and SD: Policies and Innovation Level Dimension



Source: Created by the author.

The dimension of policies in figure 8A reveals a constant in the values of government expenditure and an unstable variation in government programmes, despite improvements in the years of 2005, 2010, 2012, 2016 and 2018. Likewise, the innovation level in figure 8B increases until 2017, and decreases in 2018, from a lack of data in the analysed countries. Entrepreneurs contribute to the growth of the economy, through innovation. Therefore, it requires the consolidation of knowledge, technologies, skills and purchasing power, for attaining high returns of scale (Valliere & Peterson, 2009).

## 5.2. Correlation Analysis

Firstly, the data was analysed to guarantee a valid result from the regression analysis. Therefore, the assumptions were checked.

A correlation analysis was realised to ensure the assumption of no multicollinearity. It was developed through the Pearson Coefficient to recognise the independence of the variables, and to understand their explicative capacity (Hair Jr. et al., 2009; Fávero & Belfiore, 2017), considering the reference point of 0.7 (Anderson et al., 1990). Correlations for all variables are shown in table 5 in the following page.

Entrepreneurship Performance and Influencing Factors in the EU

Table 5 - Correlation Matrix

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
A	1														
B	0.35*	1													
C	0.12	0.28*	1												
D	0.33*	0.10	0.21*	1											
E	0.11*	0.27*	-0.18	0.40*	1										
F	0.19*	0.36*	0.26*	0.18*	0.33*	1									
G	0.51*	0.16	0.25*	0.31*	-0.05	0.35*	1								
H	0.02	0.08	0.13	0.18*	-0.09	-0.01	0.17*	1							
I	0.16*	0.23*	-0.14	0.00	0.00	0.50*	0.32*	0.24*	1						
J	0.14*	0.21*	-0.02	0.13*	-0.04	0.14*	0.15*	-0.04	0.21*	1					
K	0.27*	-0.12	0.15	-0.01	0.18*	0.25*	-0.09	-0.02	0.00	0.26*	1				
L	0.27*	0.54*	0.08	0.11*	-0.03	0.19*	-0.01	0.13*	0.20*	0.22*	0.11*	1			
M	-0.04	0.04	0.14	0.64*	0.36*	0.14*	-0.10	0.20*	-0.08	0.28*	0.05	0.23*	1		
N	0.44*	0.18*	0.03	0.69*	0.29*	0.03	0.37*	0.02	0.26*	0.15*	0.03	0.27*	0.49*	1	
O	0.32*	0.06	0.03	0.76*	0.24*	0.31*	0.59*	-0.02	0.37*	0.43*	0.06	-0.10	0.46*	0.67*	1

\*  $p < 0.05$

Note: Please refer to table 3.

Source: Created by the author.

Table 5 shows that only R&D reports a high correlation with GDP ( $r = 0.76^*$ ), an unsurprising value as higher GDP would theoretically result in more R&D expenditure. A possible explanation might be that the increase in R&D is highly correlated with more robust innovative capabilities (Rodríguez-Pose & Cataldo, 2015). Moreover, this variable is closely associated with the financial environment ( $r = 0.59^*$ ). There is also a significant link and high value with government expenditures that support entrepreneurship and the R&D transfers accessible to SMEs ( $r = 0.67^*$ ) (Rodríguez-Pose & Cataldo, 2015; Gabor, 2018; Teixeira et al., 2018). The R&D variable has been wittingly left in, so that the innovation level dimension did not have to be excluded and to avoid multicollinearity (Corrar et al., 2007; Hair Jr. et al., 2009; Lattin et al., 2011; Fávero & Belfiore, 2017).

According to Content et al. (2019), who obtained a result very similar to this study ( $r = 0.23$ ), the correlation between NEC and OPP is relatively low ( $r = 0.28$ ). Additionally, a negative and significative association from GDP with TEA is evident ( $r = -0.33^*$ ), alongside



with a positive and significant link with OPP ( $r = 0.21^*$ ) (Rusu & Roman, 2017; Bosma et al., 2018), since as income increases, employment opportunities that emerge, tend to be more profitable than owning a business (Rusu & Roman, 2018). Moreover, unemployment is positively and significantly associated with TEA ( $r = 0.11^*$ ) (Rusu & Roman, 2017; Bosma et al., 2018; Content et al., 2019).

The gender ratio is positively and significantly related to age ( $r = 0.21^*$ ) and education ( $r = 0.26^*$ ) (Arenius & Minniti, 2005). Regarding education, there is a positive and significant relation with TEA (Alvarez et al., 2011) ( $r = 0.27^*$ ). And the highest value from this dimension and NEC belongs to population ( $r = 0.54^*$ ). Furthermore, a high positive and significant relation was observed between governmental variables and GDP ( $r = 0.64^*$ ,  $0.69^*$ ), and also a positive correlation between these indicators and NEC ( $r = 0.04$ ,  $0.18^*$ ) (Amoros et al., 2019).

Although high correlation suggests multicollinearity, the VIF value ranges between 1.374 and 3.875, demonstrating no significant multicollinearity.

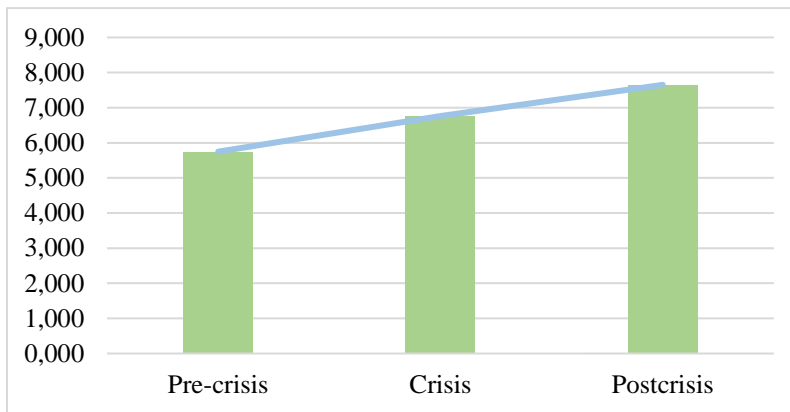
### 5.3. ANOVA Analysis

This section has been included for several reasons. In essence, it is the reflection of the effects that data demonstrates, it illustrates whether there are differences or not amongst three groups, and it describes how significantly higher or lower TEA will perform during the crisis, compared to before and after.

Likewise, in an attempt to comprehend significant differences in the crisis, established between 2008 and 2013, and its influence on entrepreneurial performance, we have developed, along with the theoretical framework, hypothesis one. *H1: Entrepreneurial performance of EU countries significantly increased during three time periods; pre-2008 crisis, 2008 crisis, post-2008 crisis* (Rusu & Roman, 2018; Velilla, 2018; Crescente-Romero et al., 2019).

A one-way between-groups analysis of variance (ANOVA) was used to investigate the impact of the economic and financial crisis in the EU (before, during, and after) on TEA (figure 9, presented in the next page).

Figure 9 - ANOVA analysis graph



Source: Created by the author.

The ANOVA revealed a statistically significant effect of the crisis on TEA,  $F(1,24) = 14.34$ ,  $p = 0.001$ . The impact of the EU financial and economic crisis on entrepreneurial performance has had similar effects among studies. There was a positive and significant effect of the 2008 recession on TEA, being an upgrade of growth and economic recovery (Rusu & Roman, 2017; Roman et al., 2018; Velilla, 2018; Crescente-Romero et al., 2019).

Post-hoc analyses with a Tukey correction (using an  $\alpha$  of 0.05) assessed the differences between the period before the crisis ( $M = 5.75$ ,  $SD = 0.371$ ), the crisis period ( $M = 6.77$ ,  $SD = 0.428$ ) and after ( $M = 7.65$ ,  $SD = 0.534$ ). This analysis revealed that the post-crisis period performed significantly better than the crisis period ( $p = 0.02$ ,  $d = 1.82$ ) or pre-crisis ( $p = 0.002$ ,  $d = 4.13$ ), and these differences had a large effect. The post-crisis period means that there was economic recovery and expanding markets. Therefore, opportunities became scarcer, and entrepreneurs had to enhance their innovative thinking, educational and training levels to better spot opportunities (Crescente-Romero et al., 2019). Correspondingly, significant differences and a larger effect was observed between the pre-crisis and crisis periods ( $p = 0.018$ ,  $d = 2.55$ ). Close to these outcomes, Velilla (2018), highlights a fall in 2009 and 2010, and the rise after 2011, and Bosma et al. (2019) report a structural increase on TEA rates since 2011, claiming that additional analysis should validate whether this is a post-economic crisis effect.

These results may be due to the convergence of businesses that occurred in EU countries after the recession, which enabled opportunities to emerge and markets to consolidate (Crescente-Romero et al., 2019). Likewise, there was an increasing number of entrepreneurs during the crisis period, even though there was a decrease of credit flows in the private sector. This might be because of the limited financial resources required to start a new business and to maintain it in the short term (Rusu & Roman, 2017; Roman et al., 2018).

This study concludes that the post-crisis period had a better TEA level. Consequently, it was observed that TEA values were better after the crisis than the crisis and pre-crisis periods. This period of crisis exposed the necessity for the EU to invest highly in changing the economic pattern (Popovici & Călin, 2012). Additionally, this recession and growth of the unemployment rate questioned the influencing factors of entrepreneurship, as new firms had to endure, despite being in financial difficulties (Rusu & Roman, 2018).

Lastly, as demonstrated above, hypothesis 1 is supported. The entrepreneurial performance was significantly higher during the financial and economic crisis than before and significantly higher after the 2008 crisis than during the crisis in the EU (Rusu & Roman, 2018; Velilla, 2018; Crescente-Romero et al., 2019).

#### **5.4. Regression Analysis**

Aiming at comprehending the explicit capacity of the variables in the entrepreneurial performance, a multiple linear regression analysis was conducted (Fávero & Belfiore, 2017).

Furthermore, to improve the understanding among the relationship between several external conditions and entrepreneurial activity, hypotheses two, three and four were developed from the theoretical framework. What is more, to facilitate the reader, the hypotheses are once again shown:

*H2: Economic, social, governmental policies and innovation conditions have a positive impact on entrepreneurial performance in the EU countries (Acs, 2006; Angulo-Guerrero et al., 2017; Chowdhury et al., 2019); H3: Economic, social, governmental policies and innovation conditions have a negative impact on necessity entrepreneurship in the EU countries (Acs & Audretsch, 2010; Rusu & Roman, 2018; Amoros et al., 2019); H4: Economic, social, governmental policies and innovation conditions have a positive impact on opportunity entrepreneurship in the EU countries (Angulo-Guerrero et al., 2017; Rusu & Roman, 2018).*

In the following sections, the hypotheses above mentioned will be validated.

##### **5.4.1. TEA as the Dependent Variable**

A regression analysis was conducted that asked if GDP per capita, unemployment, macroeconomic environment, financial environment, FDI, age, gender ratio, education, population, government programs, and government expenditures would predict TEA. Table

6 gives the unstandardised and standardised,  $\beta$ -coefficients, and their standard error for this analysis.

Table 6 - Coefficients table with TEA as the dependent variable

	$\beta$	SE	Standardised $\beta$	p
(Constant)	8.010	2.973		0.008
GDP pc	-0.006	0.005	-0.111	0.233
Unemployment	0.001	0.037	0.002	0.976
Macroeconomic Environment	0.001	0.007	0.011	0.898
Financial Environment	-0.186	0.024	-0.433	0.000***
FDI	-0.016	0.013	-0.064	0.251
Age	0.044	0.086	0.043	0.614
Gender Ratio	0.046	0.023	0.132	0.051
Education	0.045	0.012	0.202	0.000***
Population	-3.323E-5	0.000	-0.227	0.000***
Government Programmes	0.646	0.373	0.123	0.085
Government Expenditure	-1.620	0.476	-0.269	0.001**

\*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$

Source: Created by the author.

This regression model significantly predicted memory ability,  $F(11, 122) = 20.74$ ,  $p = 0.001$  and the model predicts 51% of the total variance ( $R^2 = 0.51$ ). The beta coefficients demonstrate that for an increase of 1% in the financial environment, TEA decreases 0.186, in contrast to a decrease of 0.008 (Rusu & Roman, 2018). For an increase of 1% in education, TEA increases by 0.045, for every 1000 more people TEA decreases 3.323E-5, and an increase of 1% in governmental expenditures TEA decreases by 1.620. The financial environment is the independent and significant variable that has the strongest effect on TEA.

The financial environment is relevant to explain entrepreneurial performance. The approach used in this investigation is similar to that used by Hechavarría and Ingram (2019), stemming from lack of information, moral risks, and adverse selection costs, leads to uncertainty and a decrease in financial incentives. Nevertheless, other studies have found a positive relation, claiming that entrepreneurship needs simpler access to financial resources,

which then ease economic growth through the implementation of new businesses (Bosma et al., 2018; Teixeira et al., 2018; Chowdhury et al., 2019; Crescente-Romero et al., 2019).

Higher educational levels are related to increased entrepreneurial competencies, especially within the EU, as entrepreneurs need to deal with competitive environments and pressures from customers, which can only be dealt with through the abilities provided by education (Reynolds et al., 1999; Alvarez et al., 2011; Teixeira et al., 2018; Crescente-Romero et al., 2019).

Furthermore, the significant and negative impact of the working-age population on TEA has also been observed by other studies (Reynolds et al., 1999; Chowdhury et al., 2019), compared this to the positive impact from the study of Roman et al. (2018).

Regularly, governments increase taxes to cover fiscal cracks, which has the consequence of decreasing total entrepreneurship, instead of applying more rigorous but sustainable measures of stabilising expenditure, (WEF, 2014; Teixeira et al., 2018).

Similarly to other researches, GDP and unemployment do not have a statistically significant association with the entrepreneurial activity of EU countries (Rusu & Roman, 2017; Rusu & Roman, 2018).

*Linear Regression Analysis with R&D*

To measure the dimension of the level of innovation, a linear regression between R&D and each dependent variable was carried out. Therefore, the first linear regression enquired if R&D predicts TEA. Table 7 gives the unstandardised and standardised,  $\beta$ -coefficients and their standard error for this analysis.

Table 7 - Linear Regression of R&D with TEA as the dependent variable

	$\beta$	SE	Standardised $\beta$	p
(Constant)	8.630	0.361		0.000***
R&D	-1.118	0.207	-0.317	0.000***

\*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$   
 Source: Created by the author.

This regression model significantly predicted memory ability (Alvarez et al., 2011; Teixeira et al., 2018),  $F(1,260) = 29.14$ ,  $p = 0.01$  and the model predicts 10% of the total variance ( $R^2 = 0.10$ ). The beta coefficients demonstrate that for an increase of 1% in R&D, TEA decreases 1.118. The negative effect of innovation and technology development on entrepreneurial performance occurs because of the lack of investments (Radulescu et al.,

2018; Crescente-Romero et al., 2019). What is more, technological development increases the emergence of goods and services. However, R&D activities do not always infer economic opportunities, as happens with incumbent organisations, such as universities, which produce new knowledge, but is not applied by decision-makers (Acs & Audretsch, 2010; Wennekers et al., 2010).

Consequently, hypothesis 2 was not supported, with exception to social conditions. Because of the economic dimension, represented by the financial environment, there is a negative impact on entrepreneurial performance. Significant social variables characterised by education and population have a positive and negative effect on TEA, respectively. Furthermore, the governmental policies variable is government expenditures and this also has a negative impact on total entrepreneurship. Innovative conditions also decreases TEA.

#### **5.4.2. NEC as the Dependent Variable**

A regression analysis was conducted that asked if GDP per capita, unemployment, macroeconomic environment, financial environment, FDI, age, gender ratio, education, population, government programs, and government expenditures would predict NEC. Table 8 gives the unstandardised and standardised,  $\beta$ -coefficients and their standard error for this analysis.

This regression model significantly predicted memory ability,  $F(11,90) = 16.16$ ,  $p = 0.001$  and the model predicts 66% of the total variance ( $R^2 = 0.66$ ). The beta coefficients demonstrate that for an increase of 1 euro of GDP pc NEC does not increase. For an increase of 1% of unemployment NEC increases by 0.003, while the study from Rusu and Roman (2018) suggests an increase of 1.17. Additionally, for an increase of 1% in the macroeconomic environment NEC does not increase, meaning that the economy is stable. For an increase of 1% of financial environment NEC increases in 0.002, compared to a value of 0.786 (Crescente-Romero et al., 2019). If the individual is just one year older, NEC increases by 0.009, in contrast to 0.091 in the study of Amoros et al. (2019). For an increase of 1% in the gender ratio, NEC decreases by 0.003. For every 1000 persons, NEC increases by 1.195E-6. With an increase of 1% in government expenditure, NEC decreases by 0.028. The strongest predictor is GDP pc.

The findings from the present study highlight GDP pc, the unemployment rate (Rusu & Roman, 2018), macroeconomic and financial environments (Crescente-Romero et al.,

2019), age, gender (Amoros et al., 2019), population (Roman et al., 2018), and government expenditure (Bjornskov & Foss, 2008) as the main influencers of NEC.

Table 8 - Coefficients table with NEC as the dependent variable

	$\beta$	<i>SE</i>	<i>Standardised <math>\beta</math></i>	<i>p</i>
<i>(Constant)</i>	-0.143	0.107		0.184
<i>GDP pc</i>	0.001	0.000	0.563	0.000***
<i>Unemployment</i>	0.003	0.001	0.346	0.001**
<i>Macroeconomic Environment</i>	0.000	0.000	-0.250	0.040**
<i>Financial Environment</i>	0.002	0.001	0.317	0.000***
<i>FDI</i>	0.000	0.000	0.079	0.290
<i>Age</i>	0.009	0.002	0.438	0.000***
<i>Gender Ratio</i>	-0.003	0.001	-0.358	0.000***
<i>Education</i>	0.000	0.000	0.029	0.766
<i>Population</i>	1.195E-6	0.000	0.443	0.000***
<i>Government Programmes</i>	0.000	0.009	0.004	0.969
<i>Government Expenditure</i>	-0.028	0.011	-0.240	0.017*

\*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$   
 Source: Created by the author.

Therefore, an increase in GDP has a positive result for NEC, since the rise in income stimulates demand for extending goods and services, especially in economies lacking employment alternatives (Rusu & Roman, 2017; Amoros et al., 2019). For necessity motives, as unemployment increases business implementations tend to get higher (Rusu & Roman, 2018; Amoros et al., 2019). This demonstrates that in EU countries there is a decreasing number of available jobs, being harder to find, there is an increase in the number of people who have to protect their income (Rusu & Roman, 2017; Content et al., 2019).

Furthermore, as the number of female entrepreneurs increases, NEC decreases, since the incentives for women are governmental policies that support entrepreneurship (Hechavarría & Ingram, 2019). For Amoros et al. (2019), there is no significant effect on males to become entrepreneurs by necessity.

On the other hand, the demographic variables that influence NEC as a supply channel, are age, gender and population, as these increase, there is an expansion of new business opportunities (Grilo & Thurik, 2004; Roman et al., 2018).

The government expenditure is about 58% lower compared to the impact on entrepreneurial performance. A possible explanation for this might be that necessity entrepreneurs benefit from lower government expenditure, as the knowledge created by nations is not patented, creating wealth and jobs (Bjørnskov & Foss, 2008; Valliere & Peterson, 2009).

*Linear Regression Analysis with R&D*

The second linear regression analysis enquired if R&D predicts NEC. Table 9 gives the unstandardised and standardised,  $\beta$ -coefficients and their standard error for this analysis.

Table 9 - Linear Regression of R&D with NEC as the dependent variable

	$\beta$	SE	Standardised $\beta$	p
(Constant)	0.104	0.017		0.000***
R&D	0.005	0.009	0.059	0.548

\*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$   
 Source: Created by the author.

This regression model did not significantly predict memory ability,  $F(1,87) = 0.3, p = 0.585$ . This inconsistency may be due to the discrepancy of innovation in the periphery of the EU; thus, R&D advances are dependent on improvements in institutions, human capital and the balance between the supply and demand of labour (Rodríguez-Pose & Cataldo, 2015).

Lastly, the economic dimension is a positive influence to NEC. The social condition has age, gender and population as significant indicators affecting this entrepreneurial motivation. Gender is the only variable with a negative impact. Government expenditures have a negative effect on necessity-driven entrepreneurship. With reference to the above, the coefficients on the interaction between socio-economic, governmental policies, innovation and NEC fail to reach negative significance. Therefore, hypothesis 3 is not supported, with the exclusion of gender and the governmental policies dimension.



### 5.4.3. OPP as the Dependent Variable

A regression analysis was conducted that asked if, GDP per capita, unemployment, macroeconomic environment, financial environment, FDI, age, gender ratio, education, population, government programs, and government expenditures would predict OPP. Table 10 gives the unstandardised and standardised,  $\beta$ -coefficients and their standard error for this analysis.

Table 10 - Coefficients table with OPP as the dependent variable

	$\beta$	<i>SE</i>	<i>Standardi-sed <math>\beta</math></i>	<i>p</i>
<i>(Constant)</i>	0.694	0.418		0.100
<i>GDP pc</i>	0.001	0.000	0.600	0.001**
<i>Unemployment</i>	0.007	0.003	0.304	0.054
<i>Macroeconomic Environment</i>	-0.002	0.001	-0.528	0.005**
<i>Financial Environment</i>	-0.003	0.002	-0.170	0.141
<i>FDI</i>	0.001	0.001	0.060	0.592
<i>Age</i>	0.016	0.008	0.314	0.039*
<i>Gender Ratio</i>	-0.003	0.003	-0.138	0.305
<i>Education</i>	0.001	0.002	0.090	0.540
<i>Population</i>	1.001E-6	0.000	0.144	0.205
<i>Governmental Programmes</i>	-0.022	0.035	-0.094	0.534
<i>Government Expenditure</i>	-0.08	0.045	-0.264	0.079

\*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$

Source: Created by the author.

This regression model significantly predicted memory ability,  $F(11,90) = 2.44$ ,  $p = 0.01$  and the model predicts 23% of the total variance ( $R^2 = 0.23$ ). The beta coefficients demonstrate that for an increase of 1 euro of GDP pc, OPP increases 0.001, with the exact same amount as in NEC, compared to a value of 0.067 found in a similar study from Rusu and Roman (2018). Furthermore, an increase of 1% in the macroeconomic environment OPP decreases 0.002, since as the economy grows, the number of opportunity entrepreneurs falls (Crescente-Romero et al., 2019). If the individual is just one year older, OPP increases by 0.016, a value 1.8 times higher than necessity, and compared to 0.089 from Amoros et al.

(2019). GDP pc is the strongest predictor according to the highest standardised beta amongst the significant variables.

The negative interference of the financial environment cannot be ruled out because the insignificant statistical result is critical, as there is no need for financial support for OPP (Grilo & Thurik, 2004; Alvarez et al., 2011).

*Linear Regression Analysis with R&D*

Lastly, a linear regression analysis was carried out, that enquired if R&D would predict OPP. Table 11 gives the unstandardised and standardised,  $\beta$ -coefficients and their standard error for this analysis.

Table 11 - Linear Regression of R&D with OPP as the dependent variable

	$\beta$	SE	Standardised $\beta$	p
(Constant)	0.928	0.040		0.000***
R&D	0.005	0.021	0.027	0.815

\*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$

Source: Created by the author.

This regression model did not significantly predict memory ability,  $F(1,77) = 0.055$ ,  $p = 0.815$ . The possible interference of this not significantly statistical result, cannot be ruled out of the positive effect of R&D. This can be attributed to the contribution that patenting has on knowledge sharing across borders in the EU (Rodríguez-Pose & Cataldo, 2015). Nevertheless, this finding cannot be extrapolated to analyse entrepreneurial opportunities, meaning that higher investments in R&D do not translate into more business opportunities, and therefore to higher economic growth (Stel et al., 2019). Moreover, the knowledge spillover theory of entrepreneurship (Acs et al. 2005) is not applied to OPP, as the transfer of R&D in EU economies by incumbents to entrepreneurs is slow and expensive as a whole (Hechavarría & Ingram, 2019).

Furthermore, hypothesis 4 was partially supported. The significative socio-economic conditions have a positive impact on OPP in the EU countries, except for the macroeconomic environment.

Chapter 5 provided the core findings of this study, along with its discussion demonstrated by the theory on this matter. Finally, the next chapter will review the advances achieved in the academic field and also remark on the limitations of this research.

## 6. Conclusions

This study explored whether socioeconomic, governmental and innovative conditions influence the performance of entrepreneurship and its motivations; and whether the 2008 crisis affected entrepreneurial performance. Thus, the linear relationship between the dependent and independent variables were tested using data for the period between 2003 and 2018 in 21 EU countries.

In general, the findings suggest that entrepreneurial performance significantly increased during the crisis compared to the period before. However, the recovery period has been significantly higher than previously (Rusu & Roman, 2018; Velilla, 2018; Crescente-Romero et al., 2019). Moreover, four elements explain entrepreneurial performance. Three of which also influence NEC (Rusu & Roman, 2017; Crescente-Romero et al., 2019): financial environment, population and government expenditure. The fourth factor is education, and its effect is positive. This means that a higher level of education enhances business capabilities which are needed to create a business within the EU environment, which in turn lead to an improved entrepreneurial performance (Reynolds et al., 1999; Alvarez et al., 2011; Teixeira et al., 2018).

Additionally, all the variables that influence OPP, these being GDP, macroeconomic environment and age, also impact NEC. Necessity entrepreneurship, besides being affected by the above, is also affected by unemployment and gender. The divergent result in the variables affecting these types of entrepreneurship infers that the outcome on both entrepreneurial motivations is less effective when considering entrepreneurial performance (Crescente-Romero et al., 2019).

Unpredictably, population density (Content et al., 2019), unemployment, financial environment, gender, and governmental expenditure do not promote stimulus on OPP, whereas, for NEC they do. Thus, unemployment impacts on necessity entrepreneurs, and these results concur with other studies, reporting a positive and significant impact from unemployment on NEC (Rusu & Roman, 2017; Rusu & Roman, 2018; Content et al., 2019).

Moreover, contrarily to what the literature suggests (Acs & Audretsch, 2010; Angulo-Guerrero et al., 2017; Rusu & Roman, 2018; Amoros et al., 2019) the dimensions studied are not negatively related to NEC and positively to TEA and OPP. Therefore, further advances comprise trade-offs in OPP to establish NEC in the EU. Nevertheless, opportunity entrepreneurs are not substantial positive forecasters of growth (Valliere & Peterson, 2009).

Furthermore, table 12 presents the attempt to relate the research objectives and hypotheses, with the literature review previously done, and also the results found and discussed above (Cooper & Schindler, 2011).

Table 12 – Objectives & Hypotheses vs Literature Review vs Results & Discussion

Objectives & Hypotheses	Literature Review	Results & Discussion
O1: Analyse the effects of the socioeconomic, governmental and innovative conditions on entrepreneurship performance, opportunity and necessity entrepreneurship, from EU countries, between 2003 and 2018.	Sections 3.1., 3.2., 3.3. and 3.4.	Sections 5.2. and 5.4.
O1.1: Deepen the theoretical description of the socioeconomic, governmental and innovative development in entrepreneurship performance in EU countries.	Sections 2 and 3	Section 5.1.
O1.2: Analyse the impact of the entrepreneurial development, before, during and after the period of crisis.	Section 3.3.	Section 5.3.
O1.3: Describe the relationship between socioeconomic, governmental and innovative profile, and total entrepreneurship, opportunity and necessity entrepreneurship.	Sections 2.2., 3.2. and 3.4.	Section 5.2.
H1: Entrepreneurial performance of EU countries will significantly increase during three time periods; pre-2008 crisis, 2008 crisis, post-2008 crisis.	Section 3.3.	Section 5.3.
H2: Social, economic, governmental policies and innovation conditions have a positive impact on entrepreneurial performance in the EU countries.	Chapters 3.1. and 3.4.	Chapters 5.4.
H3: Social, economic, governmental policies and innovation conditions have a negative impact on necessity entrepreneurship in the EU countries.	Sections 3.2. and 3.4.	Sections 5.4.
H4: Social, economic, governmental policies and innovation conditions have a positive impact on opportunity entrepreneurship in the EU countries.	Sections 3.2. and 3.4.	Sections 5.4.

Source: The author, adapted from Cooper and Schindler (2011).

From the table, it can be seen that each objective and hypothesis structured within this research, has had an emphasis on the literature review and the results and discussion chapters. This demonstrates the interconnectedness of the study.

The findings deliver empirical support for scientific research and the business field in the EU, as regards to entrepreneurial performance relationship. Our contributions found that TEA improves independently in the crisis period. These findings are consistent with Rusu & Roman (2018) study, which reported that the crisis is a crucial determinant for studying

the influencing factors of entrepreneurship. Velilla's (2018) study proved the significant and increasing effect of entrepreneurship, as a booster for economic recovery and expansion. The outcomes of Crescente-Romero et al. (2019) linked the increase of TEA with the crisis period.

Likewise, we have also demonstrated that socioeconomic, governmental and innovative conditions have different effects within entrepreneurship performance, opportunity and necessity entrepreneurship, from EU countries, between 2003 and 2018. Additionally, economic factors have had a negative impact on TEA, a finding related to Rusu and Roman (2017) study, whilst being an enhancing mechanism for both entrepreneurial motivations. Social conditions are positive and negative for each entrepreneurial measure; governmental policies are detrimental to TEA and entrepreneurial necessity; innovation negatively pushes entrepreneurship performance, but does not affect the other types of entrepreneurship.

To sum up, these results call for an increasing and significant impact of entrepreneurial performance because of the EU crisis. We also suggest that social, economic, governmental policies and innovation conditions have had a mainly negative impact on entrepreneurial performance in the EU countries; a positive effect on necessity-driven entrepreneurship and a positive one for opportunity-driven.

Our limitations included the use of secondary data to achieve the indicators values. However, we were hampered by a lack of data, mainly entrepreneurship indicators for some countries and years on the GEM platform, and the non-rating factors which were not available on statistical databases. Also, we did not have the most recent information on this study, and there was the absence of primary data prejudicing a more in-depth analysis through the evidence of experts. Furthermore, another limitation is the non-existence of a systematic review that defines each dimension and variables that influence entrepreneurship.

This study is one of the few analyses to explore the influencing factors that affect entrepreneurship. Therefore, through this study, we have contributed to fill this gap in the literature. Future research should test the robustness of these results in other economies, such as emerging economies. In the EU, as on other continents, there is diversity in regard to socio-economic conditions. Therefore, it would be valuable to extend this research under different circumstances, as several studies have discussed the volatile impact that entrepreneurship has on economic growth depending on the development of the country. Also, adding primary data from experts and entrepreneurs to further researches on the dimensions studied would be invaluable.

To conclude, we hoped to have a positive contribution to the academic field on the entrepreneurial performance in the EU, and to assist policymakers in the enhancement of the EU entrepreneurship level.

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Entrepreneurship Performance and Influencing Factors in the EU

APPENDIX A – Summary Table of Studies by Topic

Study	Authors	Year	Journal	Country	Characteristics	Measurement approach	Data source & sample size	Outcomes / Findings	Population of entrepreneurs
Linking Entrepreneurship and Economic Growth	Wennekers, Sander; Thurik, Roy	1999	Small Business Economy	The Netherlands	The role of entrepreneurship in the process of economic growth requires the decomposition of the concept of entrepreneurship	Literature Review	Entrepreneurship macroeconomic growth theory, industrial and evolutionary economics, and management literature on large corporate organizations	The first field is measuring entrepreneurship. The second one is its determinants. Culture and the institutional framework are necessary conditions that define how entrepreneurial an economy is, with technological, demographic and economic forces at play.	Individual, firm and aggregate level
Perceptual Variables and Nascent Entrepreneurship	Arenius, Pia; Minniti, Maria	2005	Small Business Economics	USA, Switzerland	What variables are significantly correlated with an individual's decision to become an entrepreneur	Literature Review	GEM. 2002. 3,625 nascent entrepreneurs from 28 countries.	Perceptual variables are significantly correlated with new business creation across all countries in the sample, across gender. Nascent entrepreneurs rely on subjective decisions and often biased perceptions. Perceptual variables should be included in economic models of entrepreneurial behaviour.	Individuals between 18 and 64 years
Entrepreneurship and its determinants in a cross-country setting	Freytag, Andreas; Thurik, Roy	2007	Journal of Evolutionary Economics	Germany, The Netherlands, Belgium	Determinants of entrepreneurial attitudes and activities. Test the relation between institutional variables and cross-country differences in the preferences for self-employment.	Eurobarometer survey data and simple linear regression	GEM, Economic Freedom Index, Journal of Evolutionary Economics and World Values Survey. 2005. 25 EU member states and the USA	Country specific (cultural) variables seem to explain the preference for entrepreneurship, but cannot define actual entrepreneurship.	N/A
Economic freedom and entrepreneurial activity: Some cross-country evidence	Bjørnskov, Christian; Foss, Nicolai J.	2008	Public Choice	Denmark, Norway	Cross-country differences in the level of entrepreneurship by differences in economic policy and institutional design.	OLS regressions	GEM and Economic Freedom of the World Index. 29 countries	The size of government is negatively correlated, and sound money is positive with entrepreneurial activity.	Individuals between 18 and 64 years

(Continues)

Entrepreneurship Performance and Influencing Factors in the EU

Study	Authors	Year	Journal	Country	Characteristics	Measurement approach	Data source & sample size	Outcomes / Findings	Population of entrepreneurs
Entrepreneurship and economic growth: Evidence from emerging and developed countries	Valliere, Dave; Peterson, Rein	2009	Entrepreneurship & Regional Development	Canada	An extension to the economic growth model Wong, Ho, and Autio (2005), to reflect differences in the economic effects of OPP and NEC in emerging and developed countries.	Hierarchical regression models and surveys (GEM and GCR)	GEM and GCR. 2004-2005. 44 countries	Developed countries have high-expectation entrepreneurs exploiting national investments in knowledge creation and regulatory freedom.	N/A
The Relationship between Entrepreneurship and Economic Development: Is It U-Shaped?	Wennekers, Sander; Stel, André van; Carree, Martin; Thurik, Roy	2010	Foundations and Trends in Entrepreneurship	The Netherlands	Relationship between independent entrepreneurship and economic development.	Time series or cross-sectional data	GEM (APS) and WEF. OECD countries	U-shaped on economic development and the rate of independent entrepreneurship. And a positive correlation between ambitious and innovative business start-ups and average per capita income.	N/A
Competitiveness As Determinant Of Foreign Direct Investments In Central And Eastern European Countries	Popovici, Oana; Călin, Adrian Cantemir	2012	Revista economică	Romania	Impact of competitiveness on the location decision for FDI in seven CEE countries. Compose a competitiveness index based on three indicators of the European Commission scoreboard for macroeconomic imbalances and the GDP per capita.	Panel regressions	UN Conference on Trade and Development and Eurostat. 1995-2010. 7 EU countries in CEE, not yet members of the Euro Area, 2000, in 2007 and 2010.	A positive relationship between competitiveness and FDI. After the crisis, FDI is moving towards the most competitive destinations.	N/A
Quality of government and innovative performance in the regions of Europe	Rodríguez-Pose, Andre's; Cataldo, Marco Di	2015	Journal of Economic Geography	London	Institutions shape innovative capacity by focusing on how regional government quality affects performance in the European regions.	Meta-analysis	European Nuts2 areas, including all EU countries. 1997-2009. 225 regions from 19 countries	Ineffective and corrupt governments are a barrier for the innovative capacity of the EU periphery.	N/A
Factors influencing the entrepreneurial engagement of opportunity and necessity entrepreneurs	Zwan, Peter van der; Thurik, Roy; Verheul; Ingrid; Hessels, Jolanda	2016	Eurasian Business Review	The Netherlands, France	Differences on OPP and NEC in terms of socioeconomic characteristics, personality, and perceptions of entrepreneurial support	Descriptive Statistics, multinomial logit regressions	Flash Eurobarometer survey. 2009. Business owner survey data for the United States and 32 countries in Europe and Asia	Determinants of business ownership differ for OPP and NEC business ownership. Higher probability of OPP vs NEC business owner for male, younger, wealthier, proactive, and optimistic.	N/A



Entrepreneurship Performance and Influencing Factors in the EU

Study	Authors	Year	Journal	Country	Characteristics	Measurement approach	Data source & sample size	Outcomes / Findings	Population of entrepreneurs
The Role of Innovative Entrepreneurship in Economic Development: A Study of G20 Countries	Bashir, Hajam Abid; Akhtar, Ali	2016	Management Studies and Economic Systems (MSES)	India	Relation of Innovative Entrepreneurship, economic growth and its role in the economic development of G20 member countries	SPSS, Pearson's correlation	Global Competitiveness Index, Global Innovation Index, GEM, WEF and UNESCO. 2015. G20 member countries	Entrepreneurship and innovation have a positive relationship with economic growth in general. There is a negative correlation between these since there are different averages on innovative entrepreneurship. Economies with NEC should adopt policies that educate entrepreneurs.	N/A
How economic freedom affects opportunity and necessity entrepreneurship in the OECD countries	Angulo-Guerrero, María J.; Pérez-Moreno, Salvador; Abad-Guerrero, Isabel M.	2017	Journal of Business Research	Spain	The extent to which economic freedom matters for OPP and NEC	Panel data dynamic analysis	GEM and Economic Freedom of the World Index. 2001-2012. 33 countries from OECD	Significant and negative relationship between economic freedom and NEC. There should be an appropriate legal and regulatory framework to facilitate high-quality entrepreneurship in the OECD economies.	N/A
Entrepreneurial Activity in the EU: An Empirical Evaluation of Its Determinants	Rusu, Valentina Diana; Dornean, Adina	2017	Sustainability	Romania	The impact of macroeconomic, individual and business-related factors on the dynamics of entrepreneurial activity	3 regression models and panel data fixed effect model approach	GEM and World Bank DataBank. 2002-2015. 18 EU members	Inflation rate, FDI, access to finance and total tax rate are the main macroeconomic determinants of entrepreneurship. And a significant impact of business-related factors on entrepreneurship.	Individuals between 18 and 64 years
Entrepreneurial Motivations in the European Union Countries: An Empirical Approach	Rusu, Valentina Diana; Dornean, Adina	2018	Management Dynamics in the Knowledge Economy	Romania	Identify the key factors that determine entrepreneurial motivations of individuals	Panel data regression models	GEM, The World Bank and 4 indicators of perceptions and attitudes. 2002-2015. 18 EU members	Entrepreneurial motivations are influenced by the level of economic development and total tax rate (for necessity). Perceptual indicators have a significant effect on entrepreneurship.	Individuals between 18 and 64 years

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Study	Authors	Year	Journal	Country	Characteristics	Measurement approach	Data source & sample size	Outcomes / Findings	Population of entrepreneurs
Institutions, entrepreneurship, and economic growth in Europe	Bosma, Niels; Content, Jeroen; Sanders, Mark; Stam, Erik	2018	Small Business Economy	The Netherlands	Parsimonious growth model in a 3SLS specification for institutions, entrepreneurship, and economic growth	Panel regressions	Islam (1995) and GEM. 2003-2014. 25 EU countries	Productive entrepreneurship contributes to economic growth.	N/A
Estimating the economic impacts of knowledge network and entrepreneurship development in smart specialization policy	Varga, Attila; Sebestyén, Tamás; Szabó, Norbert; Szerb, László	2018	Regional Studies	Hungary	Integrating entrepreneurship and interregional network policies into an economic modelling framework	GMR modelling	GMR-Europe. 2014-2020. 6 European regions	Entrepreneurship and external specialization policy are not equally successful in all regions. The impact of policies depends on several interrelated factors, including R&D, human capital with policy shocks.	Corporations
Europe 2020 Implementation as Driver of Economic Performance and Competitiveness. Panel Analysis of CEE Countries	Radulescu, Magdalena; Fedajev, Aleksandra; Sinisi, Crenguta Ileana; Popescu, Constanta; Iacob, Silvia Elena	2018	Sustainability	Romania, Serbia	Europe 2020 Strategy ratios that impact economic performance, expressed as the growth of the GDP pc, and economic competitiveness expressed as the share of exports	OLS panel estimations	Europe 2020 Report 2014, the Human Development Index 2015, the GCRt 2016. Poland, Slovakia, Bulgaria, Hungary, the Czech Republic, and Romania. 2004-2015	Important factors for achieving the economic performance and competitiveness goals are tertiary level of education, the school dropout ratio, the share of renewable energy in final energy consumption, and the employment rate.	N/A
Entrepreneurial Framework Conditions and Sustainable Growth in Europe. A Multimethod Analysis	Gabor, Manuela Rozalia	2018	Economics and Applied Informatics	Romania	Entrepreneurial indicators that can influence the sustainable growth of efficiency-driven and innovative-driven countries from Europe	SPSS, Pearson's correlation	National Experts Survey. 3 clusters of European countries	Significant characteristics of the European countries in terms of entrepreneurship indicators.	N/A

Entrepreneurship Performance and Influencing Factors in the EU

Study	Authors	Year	Journal	Country	Characteristics	Measurement approach	Data source & sample size	Outcomes / Findings	Population of entrepreneurs
The entrepreneurial activity using GEM data: evidence for Spain (national and regional) and for Europe	Velilla, Jorge	2018	Munich Personal RePEc Archive	Spain	Descriptive and comparative analysis of different entrepreneurial dimensions	Gimenez-Nadal et al. (2017) variables	GEM, 2015. Spain, Europe, Canada, Australia and USA	Entrepreneurial levels in Spain are below the average of Europe, the USA, Canada, and Australia.	6,591 entrepreneurs
What Drives the Creation of New Businesses? A Panel-Data Analysis for EU Countries	Roman, Angela; Bilan, Irina; Cioma, Cristina	2018	Emerging Markets Finance and Trade	Romania	Key factors that affect new businesses	Panel data	GEM, World Development Indicators and Eurostat. 2003-2015. 18 EU member countries	Macroeconomic and demographic variables are the most significant determinants, followed by characteristics of entrepreneurs and the business environment. The EU debt crisis in 2010 positively affected entrepreneurship.	N/A
Entrepreneurial intentions and entrepreneurship in Europe countries	Teixeira, Sergio Jesus; Casteleiro, Carla Maria Lopes; Rodrigues, Ricardo; Guerra, Maria	2018	International Journal of Innovation Science	Portugal	Better understanding and investigation of the factor that can have an impact on the level of entrepreneurial activity	Multiple linear regression	“GEM NES Key Indicators 2007-2015” and “GEM APS Key Indicators 2001-2015”. 2015. 22 EU countries	Indicators of entrepreneurial intention are perceived capacity, rate of nascent entrepreneurship, governmental and political factors, financing, and basic education and training influencing R&D.	Individuals between 18 and 64 years
Competitiveness and entrepreneurship rate in Europe during the economic recovery phase, 2012-2016	Crescente-Romero, Fernando; Giménez-Baldazo, Mónica; Val-Núñez, Maria Teresa del	2019	International Entrepreneurship and Management Journal	Spain	Effects of the pillars that determine competitiveness during an economic recovery phase, depending on the type of entrepreneurship	Meta-analysis (6 different regression models)	GEM and Global Competitiveness Report. 2012-2016. 19 European Countries	Different patterns in between competitiveness and entrepreneurship between the north and south of Europe. The economic recovery was important for entrepreneurship, with reduction of NEC.	N/A

Entrepreneurship Performance and Influencing Factors in the EU

Study	Authors	Year	Journal	Country	Characteristics	Measurement approach	Data source & sample size	Outcomes / Findings	Population of entrepreneurs
The Quality of Entrepreneurial Activity and Economic Competitiveness in European Union Countries: A Panel Data Approach	Rusu, Valentina Diana; Dornean, Adina	2019	Administrative Sciences	Romania	Relationship between entrepreneurial activity and the economic competitiveness quality	Panel data regression models	Global Competitiveness Index. 2011–2017. 28 EU countries	Business, macroeconomic environment and entrepreneurial quality are significant determinants of competitiveness of EU countries. And there is significant positive relation on innovation, inflation rate, FDI and competitiveness, and significant negative for job creation expectations, tax rate, costs and competitiveness.	N/A
The moderating role of IPR on the relationship between country-level R&D and individual-level entrepreneurial performance	Stel, André van; Lyalkov, Serhiy; Millán, Ana; Millán, José María	2019	The Journal of Technology Transfer	Spain, Poland, Ireland	Relationship between expenditures on R&D, Intellectual Property Rights (IPR), and entrepreneurial performance	OLS regressions	European Working Conditions Survey. 2010 and 2015. 32 European countries	R&D and IPR are positively associated with earnings of entrepreneurs. And too strict IPR legislation may hamper the diffusion of knowledge created by R&D.	Men and women aged 18 to 65 who are classified as self-employed individuals
Entrepreneurial ecosystem conditions and gendered national-level entrepreneurial activity: a 14-year panel study of GEM	Hechavarría, Diana M.; Ingram, Amy E.	2019	Small Business Economy	USA	Entrepreneurial ecosystem influences the prevalence of male and female entrepreneurship	The rates of entrepreneurship for men and women using aggregate data	GEM Survey (APS). 2001–2014. 75 countries	Entrepreneurship is highest for women when there are low barriers to entry, supportive government policy, few commercial and legal infrastructure, a normative culture that supports entrepreneurship.	Percentage of males and females active and unemployed in the labor force between ages 18–64
Necessity or opportunity? The effects of state fragility and economic development on entrepreneurial efforts	Amorós, José Ernesto; Ciravegna, Luciano; Mandakovic, Vesna; Stenholm, Pekka	2019	Entrepreneurship Theory and Practice	Finland, Costa Rica, Mexico, Chile, UK	The effects of state fragility and economic development on NEC and OPP individual efforts	Multilevel data (hierarchical linear modeling (HLM) methods)	GEM. 2005–2013. 956,925 individuals from 51 countries	State fragility has a positive effect on NEC while delaying OPP. The level of economic development moderates the relationship between state fragility and necessity efforts.	Individuals between 18 and 64 years

## Entrepreneurship Performance and Influencing Factors in the EU

Study	Authors	Year	Journal	Country	Characteristics	Measurement approach	Data source & sample size	Outcomes / Findings	Population of entrepreneurs
Perceived Innovativeness and Competitiveness of Early-Stage Entrepreneurs	Tominc, Polona	2019	Croatian Economic Survey	Slovenia	Perceived innovativeness of entrepreneurs	Surveys, comparability of collected databases and a robust and meaningful in-depth analysis	Data for 2016 were used for Hungary, while data from the 2017 GEM Survey (APS) were used for Croatia and Slovenia	Products/services produced by early-stage entrepreneurs have higher levels of technological innovativeness and lower levels of market competition. Neither gender nor age shows a statistically significant relationship with the product/service innovativeness of early-stage entrepreneurs.	Individuals between 18 and 64 years (nascent entrepreneurs)
Does related variety foster regional entrepreneurship? Evidence from European regions	Content, Jeroen; Frenken, Koen; Jordaan, Jacob A.	2019	Regional Studies	UK	Analysis of novel pan-European regional survey data that distinguishes between OPP and NEC	Survey-based data (GEM)	GEM. 2007-2014. 2000 individuals from Europe	Related variety has a positive effect on OPP and different 'varieties of capitalism' influence regional entrepreneurship.	N/A
Market-driven entrepreneurship and institutions	Alia, Abdul; Kelley, Donna J.; Levie, Jonathan	2019	Journal of Business Research	USA, Ireland	External conditions are associated with OPP, and that which offers unique and novel products or services to customers	Time series data from the WEF and GEM	GEM, WEF. 2012-2017.44 economies	Strong conditions for innovation, however, show negative correlation with entrepreneurship, on the other hand, appears to thrive under all three conditions.	Individuals rather than on the firm-level
Institutions and Entrepreneurship Quality	Chowdhury, Farzana; Audretsch, David B.; Belitski, Maksim	2019	Entrepreneurship Theory and Practice	USA, UK	How formal and informal institutional dimensions affect the quality and quantity of entrepreneurship between developed and developing countries	Regressions models through WEF, GEM, and WIPO	World Bank, the World Development Indicators, Doing Business, GEM, Economic Freedom, WEF and Cumming, Johan, and Zhang (2014). 2005-2015. 70 countries	Institutions are important for entrepreneurial quality and quantity. However, not all institutions play a similar role, there is a dynamic relationship between institutions and economic development.	Individuals between 18 and 64 years

Source: Based on the literature review.

Entrepreneurship Performance and Influencing Factors in the EU

APPENDIX B – Missing Values TEA

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	
<b>Austria</b>	Mean			$(t_{2005}+t_{2007})/2$			Mean				$(t_{2012}+t_{2014})/2$		$(t_{2014}+t_{2016})/2$		$(t_{2016}+t_{2018})/2$		
<b>Belgium</b>									$(t_{2010}+t_{2012})/2$							Mean	
<b>Bulgaria</b>	Country Eliminated																
<b>Croatia</b>																	
<b>Rep Cyprus</b>	Country Eliminated																
<b>Czech Rep</b>					Country Eliminated					$(t_{2011}+t_{2013})/2$							
<b>Denmark</b>											$(t_{2012}+t_{2014})/2$						
<b>Estonia</b>	Country Eliminated																
<b>Finland</b>																	
<b>France</b>													$(t_{2014}+t_{2016})/2$				
<b>Germany</b>					$(t_{2006}+t_{2008})/2$												
<b>Greece</b>																	
<b>Hungary</b>	Mean															Mean	
<b>Ireland</b>							$(t_{2008}+t_{2010})/2$										
<b>Italy</b>									$(t_{2010}+t_{2012})/2$								
<b>Latvia</b>	Mean											$(t_{2013}+t_{2015})/2$			Mean		
<b>Lithuania</b>	Country Eliminated																
<b>Luxemb</b>	Country Eliminated																
<b>Malta</b>	Country Eliminated																

(Continues)

## Entrepreneurship Performance and Influencing Factors in the EU

<b>Netherlands</b>											
<b>Poland</b>	Mean		Mean								
<b>Portugal</b>	Mean		$(t_{2004}+t_{2007})/2$			$(t_{2007}+t_{2010})/2$					Mean
<b>Romania</b>	Mean						$(t_{2009}+t_{2011})/2$		Mean		
<b>Slovakia</b>	Mean										
<b>Slovenia</b>											
<b>Spain</b>											
<b>Sweden</b>					$(t_{2007}+t_{2010})/2$						
<b>UK</b>											

Legend:

Missing Year

No Year Missing

$$\text{Mean} = \frac{\sum [t_{2003}; t_{2018}]}{13}$$

Source: Created by the author.

## Entrepreneurship Performance and Influencing Factors in the EU

### APPENDIX C - Definition of Dimensions and Variables with References

Dimensions	Variables	Definition	References	Data Source	Measurement
Entrepreneurship	TEA	Population who are either a nascent entrepreneur or owner-manager of a new business	(Reynolds et al., 1999) (Bosma & Kelley, 2019)	<b>GEM</b>	<b>Percentual</b>
	NEC	Percentage of those involved in TEA who are involved in entrepreneurship because they had no better options for work	(Reynolds et al., 2001) (Bosma & Kelley, 2019)	<b>GEM</b>	<b>Percentual</b>
	OPP	Population who see good opportunities to start a firm in the area where they live	(Reynolds et al., 2001) (Bosma & Kelley, 2019)	<b>GEM</b>	<b>Percentual</b>
Economic	GDP	Gross domestic product at current prices per capita	(Bjørnskov & Foss, 2008) (Guerrero-Angulo et al., 2017) (Hechavarría & Ingram, 2019)	<b>EUROSTAT</b>	<b>Numerical</b>
	Unemployment	Unemployment by sex and age	(Rodríguez-Pose & Cataldo, 2015) (Guerrero-Angulo et al., 2017) (Content et al., 2019) (Hechavarría & Ingram, 2019)	<b>EUROSTAT</b>	<b>Percentual</b>
	<b>Macroeconomic Environment</b>		(Crescente-Romero et al., 2019) (Tominc, 2019)		
	Government Current Account Balance	The record of all transactions in the balance of payments	WEF	<b>IMF</b>	<b>Percentual</b>
	Gross National Savings	National accounts data on gross domestic investment and from balance of payments-based data on net foreign investment	WEF	<b>IMF</b>	<b>Percentual</b>
	Consumer Price Inflation	Inflation, consumer prices (annual %)	(Tominc, 2019)	<b>The World Bank</b>	<b>Percentual</b>
	Government Gross Debt to GDP	Debt is the entire stock of direct government fixed-term contractual obligations to others outstanding on a particular date. It includes domestic and foreign liabilities such as currency and money deposits, securities other than shares, and loans	WEF	<b>IMF</b>	<b>Percentual</b>
	Financial Environment	Cyclically adjusted total expenditure of general government	(Grilo & Thurik, 2014) (Zwan et al., 2016) (Crescente-Romero et al., 2019) (Hechavarría & Ingram, 2019)	<b>AMECO</b>	<b>Percentual</b>
	Foreign Direct Investment	Foreign direct investment, net inflows (% of GDP)	(Guerrero-Angulo et al., 2017)	<b>The World Bank</b>	<b>Percentual</b>
	<b>Market Size</b>		(Crescente-Romero et al., 2019)		
	Imports	Imports of goods and services (% of GDP)	WEF	<b>EUROSTAT</b>	<b>Percentual</b>
	Exports	Exports of goods and services (% of GDP)	WEF	<b>EUROSTAT</b>	<b>Percentual</b>
	Social	Age	Resident population: median age	(Arenius & Minniti, 2005) (Grilo & Thurik, 2014) (Zwan et al., 2016) (Guerrero-Angulo et al., 2017) (Tominc, 2019)	<b>PORDATA</b>

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## Entrepreneurship Performance and Influencing Factors in the EU

Dimensions	Variables	Definition	References	Data Source	Measurement
Social	Female	Active population by sex	(Arenius & Minniti, 2005) (Grilo & Thurik, 2014) (Zwan et al., 2016)	<b>EUROSTAT</b>	<b>Numerical</b>
	Male	Active population by sex	(Arenius & Minniti, 2005) (Grilo & Thurik, 2014) (Zwan et al., 2016)	<b>EUROSTAT</b>	<b>Numerical</b>
	Education	Population by educational attainment level, sex and age (%) - main indicators	(Arenius & Minniti, 2005) (Bjørnskov & Foss, 2008) (Valliere & Peterson, 2009) (Alvarez et al., 2011) (Grilo & Thurik, 2014) (Zwan et al., 2016) (Guerrero-Angulo et al., 2017) (Crescente-Romero et al., 2019)	<b>EUROSTAT</b>	<b>Percentual</b>
	Population	Country Population	(Guerrero-Angulo et al., 2017) (Hechavarría & Ingram, 2019) (Tominc, 2019)	<b>AMECO</b>	<b>Numerical</b>
Governmental Policies	Fiscal Incentives	Main national accounts tax aggregates per capita	(Alvarez et al., 2011) (Grilo & Thurik, 2014) (Zwan et al., 2016) (Crescente-Romero et al., 2019) (Tominc, 2019)	<b>EUROSTAT</b>	<b>Numerical</b>
	Government Programs	The presence and quality of programs directly assisting SMEs at all levels of government (national, regional, municipal)	(Alvarez et al., 2011) (Hechavarría & Ingram, 2019)	<b>GEM</b>	<b>Percentual</b>
	Government Expenditures	Government Budget Appropriations or Outlays on R&D	WEF	<b>EUROSTAT</b>	<b>Percentual</b>
Innovation Level	R&D	Total R&D personnel and researchers by sectors of performance, as % of total labour force and total employment, and by sex	(Alvarez et al., 2011) (Rodríguez-Pose & Cataldo, 2015) (Radulescu et al., 2018) (Teixeira et al., 2018) (Hechavarría & Ingram, 2019) (Stel et al., 2019)	<b>EUROSTAT</b>	<b>Percentual</b>
	Technological Development	High-tech trade by high-tech group of products in a million euro	(Crescente-Romero et al., 2019) (Tominc, 2019)	<b>EUROSTAT</b>	<b>Numerical</b>
	Competitiveness	Global Competitiveness Index	(Zwan et al., 2016)	<b>The World Bank</b>	<b>Percentual</b>
	Innovation	Private investments, jobs and gross value added related to circular economy sectors	(Valliere & Peterson, 2009) (Alvarez et al., 2011) (Zwan et al., 2016) (Crescente-Romero et al., 2019) (Tominc, 2019)	<b>EUROSTAT</b>	<b>Numerical</b>

Source: Created by the author.

## Entrepreneurship Performance and Influencing Factors in the EU

### APPENDIX D – Variables Codebook

Indicator	Description	Memory	Measure	Unit	Period	Source	Website
<b>TEA</b>	The population who are either a nascent entrepreneur or owner-manager of a new business	Percentage of 18-64 population - Motivational Index	Percentual	%	2003-2018	GEM - APS	<a href="https://www.gemconsortium.org/data/sets">https://www.gemconsortium.org/data/sets</a>
<b>NEC</b>	Percentage of those involved in TEA who are involved in entrepreneurship because they had no better options for work	Percentage of 18-64 population - Motivational Index (OPP / TEA)	Percentual	%	2013-2018	GEM - APS	<a href="https://www.gemconsortium.org/data/sets">https://www.gemconsortium.org/data/sets</a>
<b>OPP</b>	The population who see excellent opportunities to start a firm in the area where they live	Percentage of 18-64 population - Motivational Index	Percentual	%	2013-2018	GEM - APS	<a href="https://www.gemconsortium.org/data/sets">https://www.gemconsortium.org/data/sets</a>
<b>GDP</b>	Gross domestic product at current prices per capita	The total value of all goods and services produced less the value of goods and services used for intermediate consumption in their production	Numerical	Current prices, € pc	2003-2018	EUROSTAT	<a href="https://ec.europa.eu/eurostat/web/main/home">https://ec.europa.eu/eurostat/web/main/home</a>
<b>Unemployment</b>	Unemployment by sex and age	The annual average of unemployed active people, scored by gender	Percentual	% of Active Pop	2003-2018	EUROSTAT	<a href="https://ec.europa.eu/eurostat/web/main/home">https://ec.europa.eu/eurostat/web/main/home</a>
<b>Macroeconomic environment:</b>	Sum of Government current account balance, Gross national savings, Consumer Price Inflation, Consumer Price Inflation, Government gross debt to GDP					Competitiveness Index	<a href="http://reports.weforum.org/global-competitiveness-index-2017-2018/countryeconomy-profiles/#economy=AUT">http://reports.weforum.org/global-competitiveness-index-2017-2018/countryeconomy-profiles/#economy=AUT</a>
Government current account balance	The record of all transactions in the balance of payments	The sum of the exports and imports of goods and services, payments of income, and current transfers between residents of a country and nonresidents	Percentual	%	2003-2018	IMF	<a href="https://www.imf.org/en/Data">https://www.imf.org/en/Data</a>
Gross national savings	National accounts data on gross domestic investment and from the balance of payments-based data on net foreign investment	Gross disposable income less final consumption expenditure after taking account of an adjustment for pension funds	Percentual	%	2003-2018	IMF	<a href="https://www.imf.org/en/Data">https://www.imf.org/en/Data</a>
Consumer Price Inflation	Inflation, consumer prices (annual %)	Inflation, as measured by the consumer price index, reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used	Percentual	%	2003-2018	The World Bank	<a href="https://datacatalog.worldbank.org/public-licenses#cc-by">https://datacatalog.worldbank.org/public-licenses#cc-by</a>
Government gross debt to GDP	Debt is the entire stock of direct government fixed-term contractual obligations to others outstanding on a particular date. It includes domestic and foreign liabilities such as currency and money deposits, securities other than shares, and loans	It is the gross amount of government liabilities reduced by the amount of equity and financial derivatives held by the government. Because debt is a stock rather than a flow, it is measured as of a given date, usually the last day of the fiscal year. Weighted average	Percentual	%	2003-2018	IMF	<a href="https://www.imf.org/en/Data">https://www.imf.org/en/Data</a>

## Entrepreneurship Performance and Influencing Factors in the EU

Indicator	Description	Memory	Measure	Unit	Period	Source	Website
<b>Financial environment</b>	Cyclically adjusted total expenditure of general government	Adjustment based on trend GDP Excessive deficit procedure (UUTGA) (Percentage of trend GDP at current prices)	Percentual	%	2003-2018	AMECO	<a href="https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/macro-economic-database-ameco/ameco-database_en">https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/macro-economic-database-ameco/ameco-database_en</a>
<b>Foreign Direct Investment</b>	Foreign direct investment, net inflows (% of GDP)	Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors, and is divided by GDP	Percentual	%	2003-2018	The World Bank	<a href="https://datacatalog.worldbank.org/public-licenses#cc-by">https://datacatalog.worldbank.org/public-licenses#cc-by</a>
<b>Market size</b>	The size of the market affects productivity	The natural logarithm of the sum of GDP, imports and exports	Percentual	%	2007-2017	The World Bank	<a href="https://datacatalog.worldbank.org/public-licenses#cc-by">https://datacatalog.worldbank.org/public-licenses#cc-by</a>
<b>Imports</b>	Imports of goods and services (% of GDP)	Imports of goods and services represent the value of all goods and other market services received from the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments	Percentual	%	2003-2018	The World Bank	<a href="https://datacatalog.worldbank.org/public-licenses#cc-by">https://datacatalog.worldbank.org/public-licenses#cc-by</a>
<b>Exports</b>	Exports of goods and services (% of GDP)	Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments	Percentual	%	2003-2018	The World Bank	<a href="https://datacatalog.worldbank.org/public-licenses#cc-by">https://datacatalog.worldbank.org/public-licenses#cc-by</a>

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## Entrepreneurship Performance and Influencing Factors in the EU

Indicator	Description	Memory	Measure	Unit	Period	Source	Website
<b>Institutions</b>	The institutional environment of a country depends on the efficiency and the behavior of both public and private stakeholders.	Executive Opinion Survey	Numerical	Score	2007-2017	The World Bank	<a href="https://tcdata360.worldbank.org/indicators/gci">https://tcdata360.worldbank.org/indicators/gci</a>
<b>Age</b>	Resident population: median age	The age separating the group into two halves of equal size. It means that half of the population is younger than the median age and the other half is older	Numerical	Year (age)	2003-2018	PORDATA	<a href="https://www.pordata.pt/">https://www.pordata.pt/</a>
<b>Female</b>	Active population by sex	This data collection covers all main labour market characteristics, i.e. the total population, activity and activity rates, employment, employment rates, self-employed, employees, temporary employment, full-time and part-time employment, population in employment having a second job, population in employment working during unsocial hours, working time, total unemployment, inactivity and quality of employment	Numerical	Person	2003-2018	EUROSTAT	<a href="https://ec.europa.eu/eurostat/web/main/home">https://ec.europa.eu/eurostat/web/main/home</a>
<b>Male</b>	Active population by sex	This data collection covers all main labour market characteristics, i.e. the total population, activity and activity rates, employment, employment rates, self-employed, employees, temporary employment, full-time and part-time employment, population in employment having a second job, population in employment working during unsocial hours, working time, total unemployment, inactivity and quality of employment	Numerical	Person	2003-2018	EUROSTAT	<a href="https://ec.europa.eu/eurostat/web/main/home">https://ec.europa.eu/eurostat/web/main/home</a>
<b>Education</b>	Population by educational attainment level, sex and age (%) - main indicators	Upper secondary, post-secondary non-tertiary and tertiary education (levels 3-8) from 15 to 64 years old	Percentual	%	2003-2018	EUROSTAT	<a href="https://ec.europa.eu/eurostat/web/main/home">https://ec.europa.eu/eurostat/web/main/home</a>
<b>Population</b>	Country Population	Number of people residents from 15 to 64 years old in each country during the calculation period	Numerical	1000 persons	2003-2018	AMECO	<a href="https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/macro-economic-database-ameco/ameco-database_en">https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/macro-economic-database-ameco/ameco-database_en</a>
<b>Labor market efficiency</b>	Sum of strong incentives for employees, meritocracy at the workplace, equity in the business environment between women and men, which should have a positive effect on worker performance	Executive Opinion Survey	Percentual	%	2007-2017	The World Bank	<a href="https://tcdata360.worldbank.org/indicators/gci">https://tcdata360.worldbank.org/indicators/gci</a>
<b>Fiscal incentives</b>	Main national accounts tax aggregates-per capita	Total receipts from taxes and social contributions (including imputed social contributions) after deduction of amounts assessed but unlikely to be collected	Numerical	Million euro	2003-2018	EUROSTAT	<a href="https://ec.europa.eu/eurostat/web/main/home">https://ec.europa.eu/eurostat/web/main/home</a>

## Entrepreneurship Performance and Influencing Factors in the EU

Indicator	Description	Memory	Measure	Unit	Period	Source	Website
<b>Governmental Programs</b>	The presence and quality of programs directly assisting SMEs at all levels of government (national, regional, municipal)	Entrepreneurial Framework Conditions - National Expert Survey	Percentual	%	2003-2018	GEM - APS	<a href="https://www.gemconsortium.org/data/sets">https://www.gemconsortium.org/data/sets</a>
<b>Government Expenditure</b>	Government Budget Appropriations or Outlays on R&D	Total GBAORD as a % of total general government expenditure	Percentual	% of gov exp	2003-2018	EUROSTAT	<a href="https://ec.europa.eu/eurostat/web/main/home">https://ec.europa.eu/eurostat/web/main/home</a>
<b>National patent's growth</b>	Applications to the European Patent Organization (EPO) and grants by the US Patent Office (USPTO) per 100,000 inhabitants	International Patent Classification	Numerical	100.000 Residents	2003-2013	PORDATA	<a href="https://www.pordata.pt/">https://www.pordata.pt/</a>
<b>R&amp;D</b>	Total R&D personnel and researchers by sectors of performance, as % of total labour force and total employment, and by sex	Which countries have more and less European patents required per 100,000 residents? Which countries get more and less US patents per 100,000 residents?	Percentual	%	2003-2018	EUROSTAT	<a href="https://ec.europa.eu/eurostat/web/main/home">https://ec.europa.eu/eurostat/web/main/home</a>
<b>Techonological development</b>	High-tech trade by high-tech group of products in million euro	Exports of economic, employment and science, technology and innovation (STI) data describing manufacturing and services industries or products traded broken down by technological intensity	Numerical	Million euro	2007-2018	EUROSTAT	<a href="https://ec.europa.eu/eurostat/web/main/home">https://ec.europa.eu/eurostat/web/main/home</a>
<b>Competitiveness</b>	Global Competitiveness Index	The set of institutions, policies, and factors that determine the level of productivity of an economy	Percentual	%	2007-2017	The World Bank	<a href="https://tcdata360.worldbank.org/indicators/gci">https://tcdata360.worldbank.org/indicators/gci</a>
<b>Innovation</b>	Private investments, jobs and gross value added related to circular economy sectors	The indicator includes “Gross investment in tangible goods”, “Number of persons employed” and “Value added at factor costs” in the following three sectors: the recycling sector, repair and reuse sector and rental and leasing sector	Numerical	Million euro	2008-2017	EUROSTAT	<a href="https://ec.europa.eu/eurostat/web/main/home">https://ec.europa.eu/eurostat/web/main/home</a>

Source: Created by the author.

## Entrepreneurship Performance and Influencing Factors in the EU

### APPENDIX E – Correlation Analysis

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
<b>1. TEA</b>	1																					
<b>2. NEC</b>	-0,346	1																				
<b>3. OPP</b>	0,123	0,275	1																			
<b>4. GDP pc</b>	-0,332	0,102	0,205	1																		
<b>5. Unemployment</b>	0,113	0,271	-0,176	-0,399	1																	
<b>6. Macroeconomic environment</b>	-0,193	0,364	-0,264	0,183	0,334	1																
<b>7. Financial environment</b>	-0,506	0,155	-0,251	0,307	-0,054	0,347	1															
<b>8. Foreign Direct Investment</b>	0,022	0,080	0,127	0,180	-0,091	-0,008	-0,174	1														
<b>9. Market size</b>	-0,382	0,457	0,080	0,357	-0,144	0,306	0,119	-0,025	1													
<b>10. Age</b>	-0,158	0,229	-0,139	-0,004	0,005	0,505	0,324	-0,245	0,142	1												
<b>11. Female</b>	-0,254	0,518	0,074	0,153	-0,047	0,181	-0,010	-0,119	0,886	0,209	1											
<b>12. Male</b>	-0,266	0,535	0,085	0,139	-0,041	0,188	-0,026	-0,122	0,890	0,212	0,994	1										
<b>13. Education</b>	0,268	-0,123	0,153	-0,011	-0,183	-0,248	-0,092	-0,022	-0,231	-0,001	-0,072	-0,109	1									
<b>14. Population</b>	-0,267	0,543	0,075	0,114	-0,029	0,194	-0,008	-0,128	0,892	0,195	0,990	0,996	-0,115	1								
<b>15. Fiscal incentives</b>	-0,365	0,076	0,115	0,910	-0,382	0,247	0,485	0,042	0,350	0,224	0,152	0,129	0,066	0,112	1							
<b>16. Governmental Programs</b>	-0,043	0,040	0,140	0,644	-0,359	-0,144	-0,098	0,204	0,280	-0,081	0,280	0,248	0,046	0,228	0,591	1						
<b>17. Government Expenditure</b>	-0,443	0,182	0,025	0,690	-0,290	0,025	0,372	0,015	0,371	0,260	0,313	0,301	0,034	0,270	0,702	0,486	1					
<b>18. R&amp;D</b>	-0,317	0,059	0,027	0,761	-0,237	0,307	0,595	-0,019	0,106	0,373	-0,039	-0,068	0,060	-0,097	0,854	0,464	0,675	1				
<b>19. Technological development</b>	-0,254	0,398	0,082	0,395	-0,282	0,189	0,040	0,008	0,713	0,220	0,819	0,785	0,132	0,765	0,388	0,471	0,423	0,230	1			
<b>20. Competitiveness</b>	-0,295	0,071	0,146	0,876	-0,504	-0,038	0,251	0,144	0,444	0,057	0,311	0,273	0,151	0,245	0,865	0,708	0,726	0,760	0,551	1		
<b>21. Innovation</b>	-0,358	0,546	0,142	0,362	-0,149	0,248	0,076	-0,067	0,835	0,240	0,955	0,946	-0,076	0,936	0,318	0,299	0,349	0,143	0,875	0,427	1	

Source: Created by the author.