An Empirical Investigation of the Link between Entrepreneurship Performance and Economic Development: The Case of EU Countries

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Abstract: Theory and practice suggest that entrepreneurship is the engine of economic growth. The speed with which a nation moves from economic growth to economic development depends on the performance of entrepreneurial initiatives. Given the role played by entrepreneurship for the development of an economy, increasing its performance can help the development of national markets and the increase in national competitiveness. The main objective of our paper is to investigate the link between entrepreneurial performance and economic development of countries. The research was carried out on a sample of 27 European Union countries in a period of twelve years. We used panel data regression models. As dependent variables for expressing the economic development, we considered the global competitiveness index and the gross domestic product per capita growth. As independent variables, we used a set of indicators measuring entrepreneurial performance. Our findings highlight the significant role played by increased entrepreneurial performance for enhancing the economic development of EU countries. We also find that some indicators expressing entrepreneurial performance might have different effects on the economy depending on the stage of economic development of countries. Our research provides empirical evidence regarding the need for performant entrepreneurial activities for enhancing economic development.

Keywords: entrepreneurial performance; competitiveness; economic growth; stage of economic development; panel data

1. Introduction

One of the main problems of economies is to determine the factors that can enhance their development and national competitiveness and sustain economic growth. Entrepreneurship was considered an important determining factor because it: (i) contributes to the economic development of countries and the well-being of society [1–7], having a differentiated impact depending on the degree of development of the economy [8–10]; (ii) is the engine of economic growth, contributing to the creation of new jobs and the generation of new employment opportunities [11,12]; (iii) stimulates competition [13] and competitiveness [14–16]. Entrepreneurship is the heart of innovation, productivity growth, competitiveness, economic growth and job creation [17] and is one of the main public policy issues [18,19].

Starting from these statements, our study comes as a complement to the literature that has analysed the relationship between entrepreneurship, competitiveness and economic growth. In the literature, the fact that entrepreneurship is an important factor that can
sustain economic growth and can increase the competitiveness of a country was highlighted. However, we have changed the direction from which we look at things and we considered that not only the effective number of entrepreneurs is significant to the economy but their quality and performance. Therefore, in this paper, we intend to analyse things in more depth and to point out that not only quantitative indicators measuring entrepreneurship are significant for an economy but more so the quality and the level of entrepreneurial performance.

The database was created by collecting data for a set of indicators that measure entrepreneurial performance for a sample of 27 European Union countries, for a period of twelve years (2008–2019). We also collected data regarding economic growth and national competitiveness. In the following, we applied econometric models to identify the relationship between variables. We tested several regression models to identify the one that best suited our sample.

The novelty of our study derives from the inclusion in the analysis of several indicators measuring the entrepreneurial performance. Previous studies have considered only quantitative indicators of entrepreneurship, so the inclusion in the analysis of a set of indicators that measure the performance of entrepreneurship is something new. The indicators considered for our analysis were selected from the set of relevant indicators recommended by the OECD-Eurostat Entrepreneurship Indicators Programme (EIP) [20]. The Entrepreneurship Indicators Programme aims to develop a list of indicators and standard definitions and concepts to facilitate the collection of statistics on entrepreneurship [21]. We chose the EIP because it is the only one that proposes a complete and complex set of indicators and expresses several aspects of entrepreneurial activity: firms’ dynamics on the market, employment and the wealth of firms. Only a minimal number of studies from the literature have focused on analysing some of these indicators that measure entrepreneurial performance.

Another element of novelty of this study is the fact that we perform a comparative analysis of the relationship between entrepreneurship performance, competitiveness and economic growth by groups of EU countries depending on their stage of economic development. We chose a comparative analysis because we want to identify whether the relationship between performant and successful entrepreneurship and the development of economies, expressed by national competitiveness and economic growth, is different depending on the stage of economic development of the countries.

Our paper complements the literature in the field by pointing out the need for researchers to focus more on indicators that measure the quality and performance of entrepreneurship when analysing its relation with economic growth and/or national competitiveness of countries. To date, studies have focused on identifying the relationships between entrepreneurship and economic development using indicators for measuring entrepreneurial activity, especially quantitative indicators (number of entrepreneurs, percentage of entrepreneurs, etc.).

The rest of this paper is organised as follows. First, we briefly describe the literature linking entrepreneurship to competitiveness and economic growth, after which we present our model and the description of the variables used in the analysis. Our study continues with presenting and discussing the results. Finally, the study highlights some relevant conclusions.

2. Theoretical Background and Hypothesis

2.1. The Relationship between Entrepreneurship and National Competitiveness

Focusing on the relationship between entrepreneurship and competitiveness, several researchers [14–16,22–24] have pointed out that there is a direct relationship between them. In an environment which can be defined as being competitive, entrepreneurs will be more focused on finding opportunities and therefore will better contribute to regional economic growth [25]. Entrepreneurship is significant for a country’s competitiveness and development because entrepreneurs create new businesses which generate new jobs,
more competition and may even increase productivity through innovation [26]. However, Ferreira et al. (2017) [16] have shown that different stages of the economy imply other characteristics of entrepreneurial activities and, therefore, the importance of entrepreneurship depends on the stage of economic development and can have either a positive or negative impact on the global competitiveness of countries. Using enterprise policy as a tool for improving regional competitiveness or for addressing economic and social disadvantage can be efficient, but especially in the long term [24]. To date, there are no studies that have analysed the relationship between entrepreneurship performance and national competitiveness. Thus, for achieving one of the main purposes of the paper, we have formulated a set of hypotheses that will guide our future empirical analysis:

Hypothesis 1 (H1). Higher entrepreneurial performance is positively related to national competitiveness.

Hypothesis 2 (H2). The relationship between entrepreneurial performance and national competitiveness depends by the stage of economic development of the country.

2.2. The Relationship between Entrepreneurship and the Development of the Economy

The contribution of entrepreneurship to the development of the economy is discussed by an increasing number of studies from the literature [1–3,17,25,27–31]. However, the results of these studies are different depending on the type of entrepreneurship examined. Additionally, the results of the mentioned studies are influenced by the particularities of the environment in which the entrepreneurs carry out their activity, and also according to the stage of development of countries. Likewise, there are differences between countries, depending on the institutional context but also on specific cultural factors [32–34].

Other studies [8–10] also show that entrepreneurship plays a different role in countries in various stages of economic development, pointing out that the effects of entrepreneurship on economic growth are higher in developed countries compared to developing ones. Discussing the contribution of different types of entrepreneurship to economic growth, Wong et al. (2005) [35] find that only high growth potential entrepreneurship would have a significant impact on economic growth. According to Valliere—Peterson (2009) [36], entrepreneurship is a crucial factor in economic growth, and countries that support innovation-based entrepreneurship would achieve better results in terms of economic performance. Completing these findings, Dvouletý et al. (2018) [37] point out the role of institutional context and of the regional economic development for explaining the relationship between entrepreneurship and economic growth.

Lately, the focus has changed a bit because studies are beginning to show that not only is the number of entrepreneurs essential for the economies of countries, but the quality of their activity [38]. To measure entrepreneurial performance, different indicators that express the dynamics of the companies on the market can be used, according to the Entrepreneurship Indicators Programme (EIP) (OECD 2010) [20]. However, only a small number of studies from the literature evidence the role of some of these indicators. Entrepreneurship performance is too little used in the literature and also too little analysed in relation to the economic development of countries. For instance, Acs (2006) [39] has shown that creating new enterprises can generate positive effects on economic development as they will result in creating new jobs and might increase competition, determining high levels of economic growth. Focusing on a different aspect, Albiol (2014) [40] has emphasised that the death of enterprises is beneficial to the economy. This is because the dynamics of enterprises on the market allow the exploitation and exploration of new technological and entrepreneurial opportunities. In addition, the exits of the enterprises from the markets can indirectly stimulate the entry of new ones by releasing resources into the economy [41,42]. The continuous rejuvenation of the entrepreneurship base is beneficial for the economy as a whole and also determines a positive evolution of national competitiveness.

Other studies [43,44] have focused on emphasising the significant role played by young enterprises because they are the largest contributor to job creation and employment
growth with positive effects on the economy. The owners of older enterprises can lower their commitment and involvement compared to young ones; therefore, their performance is usually diminished as the enterprises ages [45–47].

However, the analysis of the effects of entrepreneurship performance indicators on the economic development of countries is still insufficiently studied. Therefore, we include in our analysis the indicators proposed by the Entrepreneurship Indicators Programme (EIP) [20]. As shown above, some of these indicators can generate effects on the competitiveness of countries but also on their economic growth. However, the question is what is the intensity of these effects and whether the stimulation of evolutions of these performance indicators (through appropriate policies) could generate the desired effects at the general macroeconomic level.

A large part of the mentioned studies does not include indicators that measure the performance of entrepreneurship but only indicators that quantitatively measure entrepreneurship. Therefore, our primary purpose is twofold: we want to test the relationship between entrepreneurial performance, competitiveness and economic growth of countries, but we also want to identify if this relationship is different when the countries are more or less developed.

The hypotheses formulated for the second part of the study are:

**Hypothesis 3 (H3).** Higher entrepreneurial performance is positively related to economic growth.

**Hypothesis 4 (H4).** The relationship between entrepreneurial performance and economic growth depends on the stage of economic development of the country.

The literature review shows that, for the time being, there are no empirical studies focused on EU countries, which examine the link between a country’s entrepreneurial performance, national competitiveness and economic growth. Thus, our study contributes to filling the gap in the literature.

3. Data and Method

For identifying the relationship between entrepreneurial performance, national competitiveness and economic growth, we have considered a sample of 27 European Union (EU) member countries for a period of twelve years, 2008–2019. We excluded Greece from the sample because we did not find enough data for the indicators that measure the entrepreneurial performance. On 1 February 2020, the United Kingdom withdrew from the EU, however, considering that we analysed a past period, we kept this country in the sample.

As shown in the literature [10,31,48], the analysis of the relationship between entrepreneurship and economic growth has provided different results for the cases of developing or developed countries. Therefore, because we set out to identify the particularities of the relation between the entrepreneurial performance, national competitiveness and economic growth according to the stage of development of countries, we have classified the countries into two groups, following the study conducted by Schwab—Sala-i-Martin (2017) [49]. The authors considered the level of gross domestic product (GDP) per capita as the criterion for classifying the countries into five groups. We have selected only those groups that fit the countries of the European Union, as follows: efficiency-driven economies, in transition between efficiency and innovation and innovation-driven economies. The variation ranges for the GDP per capita for the three groups are: between USD 3000 and 8999 for the economies considered to be efficiency-driven (Bulgaria), between USD 9000 and 17,000 for the countries in transition between efficiency and innovation (Croatia, Hungary, Latvia, Lithuania, Poland, Romania and Slovak Republic) and over USD 17,000 for the innovation-driven group of countries (Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Malta, Portugal, Slovenia, Spain, Sweden, the United Kingdom) [49,50]. As Bulgaria is the
only country included in the efficiency-driven stage, for our further analysis, we included it in the transition stage. Therefore, we focused our empirical analysis on two groups of EU countries: economies in transition and innovation-driven economies.

To realise the empirical investigation, we have considered a set of indicators measuring the competitiveness level, the level of economic growth and also the entrepreneurial performance. Therefore, the dependent variables in our study are the competitiveness index and gross domestic product (GDP) per capita growth. The global competitiveness index (GCI) is composed of twelve pillars that measure a wide range of aspects of development [49]. These are represented by institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labour market efficiency, financial market development, technological readiness, market size, business sophistication and innovation. The GCI is an index calculated by the World Economic Forum for measuring the competitiveness of countries and results in an aggregation of 103 individual factors. Each component of the index is expressed by a progress score, on a scale from 0 to 100, where 100 represents an ideal state where an issue ceases to be a constraint to productivity growth [51]. Data for these indicators were obtained from the World Bank (2020) [52].

To measure economic growth, we used the GDP per capita growth indicator, which measures the annual percentage growth rate of GDP per capita based on constant local currency. The data for this indicator were gathered from World Development Indicators [53]. The use of GDP per capita growth for measuring the economic growth of countries is a common practice in the literature [10,31,48] so we have adopted this indicator for our analysis.

The independent variables consist of a set of business demography indicators that can describe the entrepreneurial performance. The selection of these indicators was made starting from the Entrepreneurship Indicators Programme from the OECD [20]. This programme gathers a set of indicators which consider three key topics on entrepreneurship: the performance, its determinants and impact expressed as policy targets. For measuring performance, the programme proposes 18 indicators targeting different dimensions of entrepreneurial performance and are classified into three groups, namely: the first group includes indicators relating to firms (such as firm births and deaths, firm survival), the second group concerns employment (e.g., employment in new firms) and the third group refers to wealth (for example, value-added created by young firms, the contribution of small and young firms to productivity growth, the export performance of small firms). In our empirical investigation, we took into account the most representative of these indicators depending on the availability of data in the Eurostat database [54]. The considered indicators offer a clear image on business dynamics, also regarding the effect on innovation and productivity. We chose PPE because it is the only programme we found that proposes a complete and complex set of indicators for measuring entrepreneurship performance.

Table 1 briefly describes the independent variables included in the analysis, their definition, abbreviation and measurement.

| Variables                | Abbreviations [Measures] | Definitions                                                                 |
|--------------------------|--------------------------|-----------------------------------------------------------------------------|
| Enterprise birth rate    | Birth [%]                | number of enterprise births in the reference period (t) divided by the number of enterprises active in t |
| Enterprise death rate    | Death [%]                | number of enterprise deaths in the reference period (t) divided by the number of enterprises active in t |
| Business churn           | Churn [%]                | birth rate + death rate                                                     |
Table 1. Cont.

| Variables                                      | Abbreviations [Measures] | Definitions                                                                 |
|------------------------------------------------|--------------------------|-----------------------------------------------------------------------------|
| Net business population growth                 | Bpop [%]                 | net increase in the number of businesses in reference period (t) compared to previous period (t − 1) |
| Survival rate 3                                | Surv3 [%]                | number of enterprises in the reference period (t) newly born in t − 3 having survived to t divided by the number of enterprise births in t − 3 |
| Survival rate 5                                | Surv5 [%]                | number of enterprises in the reference period (t) newly born in t − 5 having survived to t divided by the number of enterprise births in t − 5 |
| Employment share of 3-year-old enterprises     | Emp3 [%]                 | number of persons employed in enterprises newly born in t − 3 having survived to t, divided by the number of persons employed in the population of active enterprises in t |
| Employment share of 5-year-old enterprises     | Emp5 [%]                 | number of persons employed in enterprises newly born in t − 5 having survived to t, divided by the number of persons employed in the population of active enterprises in t |
| 3-year-old enterprises’ share of the business population | Old3 [%] | number of enterprises newly born in t − 3 that have survived in t divided by the active enterprises in t |
| 5-year-old enterprises’ share of the business population | Old5 [%] | number of enterprises newly born in t − 5 that have survived in t divided by the active enterprises in t |
| Average size of three-year-old enterprises     | Size3 [number]          | number of persons employed in the reference period (t) among enterprises newly born in t − 3 having survived to t divided by the number of enterprises in t newly born in t − 3 having survived to t |
| Average size of five-year-old enterprises      | Size5 [number]          | number of persons employed in the reference period (t) among enterprises newly born in t − 5 having survived to t divided by the number of enterprises in t newly born in t − 5 having survived to t |

Source: authors’ own work based on the information provided by Eurostat database [54].

We also included in the sample three control variables: education, population size and resource endowment. For the variable expressing education, we considered the indicator measuring the quality of primary education, from the fourth pillar of competitiveness: health and primary education. From 2018, the structure of indicators that are part of the GCI was changed, therefore we considered the data for a new indicator skillset of graduates. For measuring resource endowment, we considered total natural resource rents. The data for this variable were obtained from World Bank databases [52,53].

To test our hypotheses, we resorted to empirical methods and we used panel data estimation techniques. We applied an OLS model adapted to panel data, random effects and fixed effects models. The general equation of our model is presented below:

$$y_{it} = \beta_1 enperf_{it} + \beta_2 control_{it} + \mu_{it}$$  \hspace{1cm} (1)

where: $i$ represents the country and $t$ is the time; $y$: the dependent variable; $enperf$: the indicators measuring entrepreneurial performance (independent variables); $\beta_1$ and $\beta_2$: the coefficients; $control$: the control variables; $\mu$: the error term.

The specific models adapted to our case are:

$$\text{GCI}_{it} = \beta_1 enperf_{it} + \beta_2 control_{it} + \mu_{it},$$  \hspace{1cm} (2)

$$\text{GDPC}_{it} = \beta_1 enperf_{it} + \beta_2 control_{it} + \mu_{it}.$$  \hspace{1cm} (3)

For the empirical investigation, we first ran a descriptive statistics analysis. Secondly, we transformed the variable measuring population. This variable is in absolute value, therefore we applied the natural logarithm. After, we tested for the existence of correlation between variables. In the last step, we applied the regression models to our data. To
identify which model is a better fit to our data, we used the *Hausman specification test* and the *redundant fixed effects test*.

4. Results and Discussions

Using previous research as a starting point, we have analysed the relationship between entrepreneurial performance and national competitiveness but we have differentiated our analysis by using two types of countries: in transition and innovation-driven. In Table 2, we show the results of the descriptive statistics of the independent and dependent variables considered in the analysis.

Table 2. Descriptive statistics of the variables.

| Variable | Mean | Median | Max. | Min. | Standard Deviation | Observations |
|----------|------|--------|------|------|--------------------|--------------|
| GCI      | 4.735| 4.548  | 5.612| 3.928| 0.485              | 243          |
| GDPC     | 0.816| 1.317  | 23.940| -14.559| 3.801                  | 243          |
| Birth    | 10.482| 9.995  | 24.880| 3.040| 3.781              | 234          |
| Death    | 9.211| 8.650  | 29.050| 0.960| 3.607              | 231          |
| Churn    | 19.681| 18.650  | 49.090| 5.650| 3.607              | 231          |
| Bpop     | 1.685| 1.300  | 35.470| -13.640| 4.605                  | 212          |
| Surv3    | 60.155| 58.750  | 100.000| 23.230| 13.649              | 223          |
| Surv5    | 46.422| 44.480  | 86.730| 17.910| 12.583              | 192          |
| Empl3    | 2.783| 2.575  | 7.710 | 0.930| 1.075              | 224          |
| Empl5    | 2.527| 2.310  | 7.150 | 0.000| 1.055              | 205          |
| Old3     | 5.753| 5.630  | 12.350| 1.960| 1.484              | 229          |
| Old5     | 4.266| 4.150  | 8.080 | 0.000| 1.059              | 210          |
| Size3    | 3.335| 2.980  | 8.670 | 1.140| 1.274              | 207          |
| Size5    | 2.716| 2.490  | 7.030 | 0.840| 0.909              | 227          |
| Educ     | 4.861| 4.800  | 6.800 | 3.200| 0.714              | 243          |
| LPop     | 15.868| 15.947  | 18.226| 12.922| 5.800              | 243          |
| Res      | 0.570| 0.348  | 2.579 | 0.001| 5.800              | 234          |

Source: authors’ own calculations.

The summary of the descriptive statistics emphasises the fact that the *global competitiveness index* data are distributed between a minimum level of 3.92 (in Bulgaria, 2008) and a maximum of 5.61 (in Sweden, 2012). The value of the standard deviation showed relatively small variations in this index between the EU countries and also for the analysed period. The other dependent variable, *GDP per capita growth*, varied between a minimum of −14.55% (in Estonia, 2009) and a maximum of 23.94% (in Ireland, in 2015).

From the category of independent variables, the *survival rate* has the highest variation. The *survival rate at 3 years* had the highest value of 100% in Malta (2014) and the lowest of 23% in Lithuania (2012). The positive results obtained by Malta can be explained by the support offered by the government in this country for small and medium enterprises. The initiative is called the Family Business Act and is the first of its kind in Europe, initiated in 2011 [55]. This initiative comprises a set of measures aimed at improving the survival rate of enterprises by two financing schemes. On the other hand, the low survival rate of enterprises in Lithuania could be determined by actual deaths, indicating a deterioration in the business environment of the country, or could be determined by break-ups or mergers.

The *net business population growth* varied significantly between countries and over the twelve years analysed. In Romania (in 2011), the highest growth rate of the business population was found (of 35%). The significant increase in the business population in Romania in 2011 was due to the fact that the economy started to recover from the depression due to the financial crisis, and entrepreneurs had the courage to be involved in entrepreneurial activities again. This increase was registered especially at the level of micro-enterprises because most companies that were born in 2011 in Romania were micro-sized enterprises (having between one and four employees).
In Lithuania (in 2009), the highest decrease of the business population was found (of 13%). The case of Lithuania might be explained by the fact that the birth rate in 2009 had its lowest value for all the analysed years and the death rate was very high (more than 20%) because of the manifestation of the financial crisis.

The birth rate for the EU enterprises varied between a maximum of 24.88% (in Lithuania, in 2012) and a minimum of 3.04% (in Malta, in 2016). On the other hand, death rate reached the highest value of 29.05% in Lithuania in the context of the recent financial crisis (in 2008), and the lowest value in Ireland (0.96% in 2016). Lithuania also registered the highest business churn rate, while the smallest value of this indicator was in Cyprus.

As regards the control variables, the highest values of basic education received by the population are registered in Finland (2012–2013) and the lowest in Spain (in 2010). The largest population was registered in Germany (in 2019) and the smallest in Malta (2008). The resource endowment variable had the highest value in Estonia (2011) and the lowest in Cyprus (2016).

All these findings confirm our assumptions that entrepreneurial performance is different according to the country and its level of economic development, and also support the reason why we decided to carry out our further econometric analysis on groups of countries.

To highlight the existent differences between the two groups of countries regarding the indicators selected in the analysis, we have compared the average values (see Table 3). The results suggest that, regarding competitiveness, the innovative countries are better situated than the countries in transition. In contrast, the situation is precisely the opposite when we consider GDP per capita growth.

Table 3. Comparing average values of indicators for transition and innovation countries.

|                          | Innovation Countries | Transition Countries |
|--------------------------|----------------------|----------------------|
| Global competitiveness index | 4.93%                | 4.26%                |
| GDP per capita growth     | 0.35%                | 1.20%                |
| Birth rate                | 9.17%                | 13.67%               |
| Death rate                | 8.11%                | 11.89%               |
| Business churn            | 17.26%               | 25.59%               |
| Net business population growth | 1.18%            | 2.95%                |
| Survival rate at 3 years  | 62.75%               | 53.82%               |
| Survival rate at 5 years  | 49.10%               | 39.90%               |
| Employment share at 3 years | 2.31%             | 3.90%                |
| Employment share at 5 years | 2.07%             | 3.55%                |
| 3-year-old enterprises    | 5.36%                | 6.69%                |
| 5-year-old enterprises    | 4.09%                | 4.65%                |
| Average size of 3-year-old enterprises | 2.43%             | 3.41%                |
| Average size of 5-year-old enterprises | 2.84%         | 4.45%                |
| Education                 | 5.32%                | 4.28%                |
| Total population          | 21,309,693           | 11,018,867           |
| Resource endowment        | 0.40%                | 0.93%                |

Source: authors’ own calculations.

Additionally, the dynamics of the number of enterprises are higher in the countries in transition. These countries have higher birth rates but also higher death rates. The entry rates in transition countries are higher compared to innovative ones because in developing countries there exist fewer high-paying jobs and individuals decide to become entrepreneurs to earn their living. At the same time, in more developed and wealthier countries individuals find more attractive employment options than becoming self-employed [56]. However, higher entry rates do not translate into higher rates of competitiveness for transition countries. The innovative group of countries has higher competitiveness rates, almost 0.70% compared with transition economies. Thus, these results point out that successful firm entry is what determines an increase in competitiveness and not necessarily just the number of enterprise births.
Likewise, in transition countries, the net business population growth is higher, almost 2%, but the survival rate at 3 at 5 years is lower by around 10%. The percentage of young enterprises is higher in transition countries, as well as employment share, at 3 and 5 years.

These results point out the fact that in less developed countries, more people are looking to enter into entrepreneurship, as an escape from unemployment. Meanwhile, in more developed countries, there is greater stability of the economic and business environment, which gives the companies better prospects for development and survival. The population and also the percentage of people who receive basic education are larger in more developed countries. Meanwhile, the resource endowment is higher in less developed countries.

The correlation matrix of the variables (see Table 4) shows that there exists correlation between some of the considered variables (correlation coefficient above 0.70). Thus, business churn is highly correlated with birth and death rate. Survival rate at 3 years is highly correlated with survival rate at 5 years. Employment share at 3 years is highly correlated with employment share at 5 years. Average size of 3-year-old enterprises is highly correlated with average size of 5-year-old enterprises.

**Table 4. Correlation matrix.**

|       | GCI  | GDPC  | Birth | Death | Churn | Bpop | Surv3 | Surv5 | Emp3 | Emp5 | Old3 | Old5 | Size3 | Size5 | Educ | Lpop | Res  |
|-------|------|-------|-------|-------|-------|------|-------|-------|------|------|------|------|-------|-------|------|------|-----|
| GCI   | 1.00 |       |       |       |       |      |       |       |      |      |      |      |       |       |      |      |     |
| GDPC  | -0.121 (0.103) | 1.00  |       |       |       |      |       |       |      |      |      |      |       |       |      |      |     |
| Birth | -0.411 (0.003) | 0.230 | 1.00  |       |       |      |       |       |      |      |      |      |       |       |      |      |     |
| Death | -0.458 (0.036) | -0.072 (0.000) | 0.547 |       |       |      |       |       |      |      |      |      |       |       |      |      |     |
| Churn | -0.495 (0.000) | 0.093 (0.013) |       | 1.00  |       |      |       |       |      |      |      |      |       |       |      |      |     |
| Bpop  | -0.091 (0.000) | 0.265 (0.000) | 0.440 | -0.084 (0.000) | 0.208 |      |       |       |      |      |      |      |       |       |      |      |     |
| Surv3 | 0.301 (0.000) | -0.052 (0.000) |       |       | -0.563 (0.000) | 0.173 |      |       |      |      |      |      |       |       |      |      |     |
| Surv5 | 0.353 (0.000) | -0.155 (0.000) | -0.554 | -0.623 (0.000) | 0.668 | 0.005 (0.000) | 0.751 |       |      |      |      |      |       |       |      |      |     |
| Emp3  | -0.648 (0.000) | 0.180 (0.000) | 0.562 | 0.428 (0.000) | 0.563 | 0.221 (0.000) |       | -0.187 (0.000) | 0.107 |      |      |      |       |       |      |      |     |
| Emp5  | -0.627 (0.000) | 0.062 (0.000) | 0.474 | 0.419 (0.000) | 0.508 | 0.172 (0.000) |       | -0.198 (0.000) | -0.393 (0.000) |      |      |      |      |       |       |      |      |     |
| Old3  | -0.211 (0.000) | 0.180 (0.000) | 0.420 | 0.315 (0.000) | 0.419 | 0.159 (0.000) |       | -0.002 (0.000) | -0.124 (0.000) | 0.412 |      |      |      |       |       |      |      |     |
| Old5  | -0.120 (0.000) | 0.038 (0.000) | 0.193 | 0.242 (0.000) | 0.247 | -0.015 (0.000) |       | 0.008 (0.000) | 0.361 (0.000) | 0.661 | 0.485 |      |      |       |       |      |      |     |
| Size3 | -0.366 (0.407) | 0.027 (0.000) | 0.520 | 0.437 (0.000) | 0.545 | 0.250 (0.000) |       | -0.155 (0.000) | -0.191 (0.000) | 0.543 | 0.584 | 0.426 | 0.230 |       |       |      |     |
| Size5 | -0.314 (0.000) | 0.010 (0.000) | 0.452 | 0.378 (0.000) | 0.472 | 0.174 (0.000) |       | -0.148 (0.000) | -0.210 (0.000) | 0.524 | 0.431 | 0.247 | 0.231 |       |       |      |     |
| Educ  | 0.632 (0.000) | 0.771 (0.000) | -0.255 | -0.464 (0.000) | 0.030 | 0.288 (0.000) |       | -0.385 (0.000) | -0.481 (0.000) | -0.469 | -0.154 | -0.150 | -0.340 | -0.365 |       |      |     |
| Lpop  | 0.180 (0.000) | -0.028 (0.000) | -0.238 | -0.062 (0.000) | -0.173 | -0.147 (0.000) |       | -0.066 (0.000) | -0.080 (0.000) | -0.071 (0.000) | -0.098 (0.000) | -0.221 | -0.112 | -0.113 | -0.165 | -0.174 |      |     |
| Res   | -0.218 (0.003) | 0.216 (0.000) | 0.315 | 0.340 (0.000) | 0.372 | 0.220 (0.000) |       | 0.016 (0.000) | -0.158 (0.000) | 0.424 | 0.412 | 0.527 | 0.409 | 0.278 | 0.370 | -0.168 | -0.120 |     |

Source: authors’ own work. Note: high correlation coefficients are marked with bold (with values above 0.70). The correlation coefficients between 0.40 and 0.70 are marked with italics.

To ensure that we obtained accurate results, we eliminated from the analysis some of the highly correlated variables (business churn, the survival rate at 5 years, employment share at 5 years and average size of 3-year-old enterprises). In addition, because other variables have quite high correlation coefficients (above 0.40), we ran alternative regressions with these variables to eliminate the problem of multicollinearity.

Our empirical analysis has a dual purpose: (i) to identify the link between entrepreneurial performance and competitiveness; (ii) to identify the link between entrepreneurial performance and economic growth.

The first part of the empirical analysis considers as a dependent variable the national competitiveness (see Table 5). Therefore, to find the best model fitting to our sample we ran the regression analysis by applying three different models: ordinary least squares (OLS), fixed effects model (FE) and random effects model (RE). We used the three models for each group
of countries: a total of 27 EU countries, including innovative economies (19 countries) and economies in transition (eight countries). As the results are different for each model applied, we have tested to see which model better describes the relationships between variables. We ran two tests: the Hausman test and the redundant fixed effects test.

Table 5. Effects of entrepreneurial performance on competitiveness.

| Dependent Variable | 27 EU Countries (OLS) | Innovation Countries (Cross Section Fixed Effects) | Transition Countries (Cross Section Fixed Effects) |
|--------------------|-----------------------|-----------------------------------------------------|---------------------------------------------------|
|                    | Model A1   | Model A2   | Model B1   | Model B2   | Model C1   | Model C2   |
| Birth              | 0.016     | -         | 0.024 **  | -         | 0.010 **  | -         |
|                    | (0.009)   |           | (0.004)   |           | (0.006)   |           |
| Death              | -         | -0.021 ***| -         | -0.014 ***| -         | -0.004    |
|                    |           | (0.005)   |           | (0.013)   |           | (0.008)   |
| Bpop               | 0.002     | -0.005    | -0.001    | 0.006     | 0.002     | 0.001     |
|                    | (0.003)   | (0.005)   | (0.003)   | (0.002)   | (0.004)   | (0.002)   |
| Surv3              | 0.006     | -         | 0.002 **  | -         | -0.002 ** | -         |
|                    | (0.002)   |           | (0.001)   |           | (0.001)   |           |
| Empl3              | -0.229 ***| -         | -0.018 ** | -         | -0.016 ** | -         |
|                    | (0.043)   |           | (0.058)   |           | (0.011)   |           |
| Old3               | -         | 0.025 **  | -         | 0.007 ***  | -         | 0.062 ***  |
|                    |           | (0.011)   |           | (0.003)   |           | (0.010)   |
| Old5               | 0.082     | -         | 0.008     | -         | 0.002     | -         |
|                    | (0.025)   |           | (0.008)   |           | (0.005)   |           |
| Size5              | -         | -0.033 *  | -         | 0.044 ***  | -         | -0.044 *** |
|                    |           | (0.017)   |           | (0.020)   |           | (0.020)   |
| Educ               | 0.316 *** | 0.408 *** | 0.113 *** | 0.093 ***  | 0.099 ***  | 0.093 ***  |
|                    | (0.029)   | (0.029)   | (0.020)   | (0.021)   | (0.018)   | (0.021)   |
| Lpop               | 0.105 *** | 0.108 *** | 1.352 *** | 1.166 ***  | 1.235 ***  | 1.166 ***  |
|                    | (0.004)   | (0.005)   | (0.263)   | (0.159)   | (0.164)   | (0.159)   |
| Res                | 0.001     | -0.029    | 0.009     | 0.005     | 0.009     | 0.005     |
|                    | (0.021)   | (0.032)   | (0.016)   | (0.017)   | (0.016)   | (0.017)   |
| Obs.               | 186       | 189       | 129       | 133       | 129       | 133       |
| R-squared           | 0.633   | 0.519   | 0.975   | 0.973   | 0.759   | 0.739   |
| R-squared adjusted  | 0.616   | 0.500   | 0.970   | 0.968   | 0.701   | 0.681   |
| F-statistic         | 38.18 *** | 27.93 *** | 117.37 *** | 168.01 *** | 67.53 *** | 68.36 *** |

Note: *, ** and *** represent 10%, 5% and 1% level of confidence, respectively. The statistically significant coefficients are in bold. Source: authors’ own work.

For Model A, which comprises all the 27 EU countries, the results of the Hausman test point out that the H0 hypothesis (random effects are preferred) is strongly accepted because p values = 1.000. On the other hand, the results for the redundant fixed effects test show that the fixed effects are preferred. As p values are less than 0.05, this means that we reject the null hypothesis (H0: the fixed effects are redundant). The contradiction between the results of the two tests points out that the pooled OLS regression is a better fit for Model A [57].

For Model B, including only the innovation EU countries, the results of the Hausman test indicate that the H0 hypothesis (random effects are preferred) is strongly accepted (p values = 1.000). After running the regression with fixed effects and applying the redundant fixed effects test, we observe that the null hypothesis is firmly rejected for cross section and combined fixed effects (p values < 0.05, H0: the fixed effects are redundant). When testing only for period fixed effects, the result shows that H0 is accepted (p values > 0.05), and that period fixed effects are redundant. This result emphasises that the cross section fixed effects are statistically significant for Model B.
The number of observations for Model C (targeting transition countries) allows us to run only the pooled OLS and fixed effects model. Applying the redundant fixed effects test shows that H0 is accepted (p values > 0.05) and that period fixed effects are redundant. As cross section and combined fixed effect p values are less than 0.05, we strongly rejected H0. Therefore, the cross section fixed effects are the best fit to this model.

The results summarised in Table 5 emphasise that almost all the indicators measuring entrepreneurial performance significantly influence national competitiveness of EU countries. In addition, they highlight that the relationship between entrepreneurial performance and national competitiveness is different according to the economic situation of the analysed countries. Hypotheses 1 and 2 are thus confirmed.

In the following, we analyse each indicator in turn. Thus, enterprise birth rate has a positive relation with national competitiveness for all three models, but this relationship is statistically significant only when we consider the countries by groups (Model B and Model C). This result is somewhat expected because an increase in the number of companies on the market puts the companies in a position to face competition. Therefore, they have to become more efficient, seeking to apply innovative processes, and to adopt new technologies to increase overall productivity, thus positively influencing national competitiveness. As shown in the literature [58–60], intense rivalry among enterprises, pressure and challenges are seen as significant factors for increasing national competitiveness. Creation of new enterprises on the market will cause enterprises to develop new skills but, at the same time, new entrants will bring a novel approach to competing.

On the other hand, some studies [61] argue that the quality of the new enterprises created is as important as the quantity, maybe even more important. To ensure the increase in national competitiveness through new enterprise creation, it is necessary for a country to create the preconditions for enterprise growth: market share, innovation, technological progress, financial efficiency and sustainability of employment levels [22].

The enterprise death rate has a negative relation with national competitiveness for all three models, but this relation is statistically significant only for Models A and B. Higher exit rates will determine a decrease in national competitiveness, because they will determine a reduction in the number of competitors. The companies remaining on the market will face less competition, not being motivated to invest as much in innovation, generating adverse effects on national competitiveness. For the transition countries, the indicator measuring enterprise death rates does not have a statistically significant effect on national competitiveness.

As regards the survival rate at 3 years, our findings highlight a positive relation between this indicator and competitiveness for innovation countries, and a negative relation for transition countries. In the case of developed countries, higher survival rates stimulate national competitiveness. In the transition countries, higher survival rates lower competitiveness. The data on entrepreneurship have shown that many enterprises in the countries in transition are motivated by necessity. The individuals who set up enterprises in these countries most often are seeing entrepreneurship as an escape from unemployment, and then their survival will negatively affect national competitiveness. Comparatively, in the innovative countries, the companies are predominately motivated by opportunity and follow business opportunities and are interested in obtaining greater profits by applying innovative techniques and processes. Survival of these companies has positive effects on national competitiveness because earnings of opportunity entrepreneurs are significantly higher compared to those of necessity entrepreneurs [62].

Additionally, in the literature it has been shown that the survival rate of enterprises is closely related to the economic and political environment of that country. The relation of the enterprises with the economic environment and some location-specific factors (such as access to markets and financial services) contribute significantly towards explaining their survival probability [63]. In addition, the funding programs offered by different authorities (national, regional or international) have a positive impact on the survival rates of small enterprises during their early years of operation [64,65]. The economic practice shows
that public policies promoted in EU countries would play a significant role in ensuring the survival of enterprises. Thus, it is found that countries that promote different public policies for sustaining the survival of small businesses on the market have higher survival rates [66].

In our analysis, the survival rate at 3 years and at 5 years has higher values for the innovation countries compared to transition ones. This is usually because the more developed countries recognise the role played by the enterprises in economic development and promote public policies to support their survival. The European Commission programme ‘Early Warning Europe: helping small and medium-sized enterprises to survive and prosper’ emphasises that early intervention can rescue companies in financial difficulties and bring positive results, turning around their economic performance. The programme was launched in December 2016 and has the purpose of helping companies avoid bankruptcy by identifying which ones face difficulties and giving them relevant and timely advice and support. In the last 3 years, the ‘Early Warning Europe’ project helped more than 3300 companies from four target countries, namely: Greece, Italy, Poland and Spain. In addition, the project is in the process of launching in another six European countries: Croatia, Finland, Hungary, Lithuania, Luxembourg and Slovenia [66].

Employment share at 3 years has a negative relationship with national competitiveness for all the groups of countries. The increase in employment share at 3 years would reflect a deterioration of the entrepreneurial perspective, and a reduction in the number of employees in older companies on the market, either due to their exit from the market or due to a reduction in the number of jobs, or in the conditions of restricting their activity. Negative evolution of the old companies will have negative effects on national competitiveness. However, these results should be interpreted with caution because labour migration (from older to younger enterprises) may be due to innovation embodied in automation and robotisation of production lines (resulting in redundancies). Our empirical results (see Table 5) show that this approach is all the more justified as the impact of employment share at 3 years is higher for innovative countries.

The literature on job creation provides evidence that small enterprises and newly formed enterprises create a substantial number of new jobs. Several studies emphasise that small and new enterprises are the source for most of the new jobs created [43,67]. Small enterprises are indeed driving forces of aggregate employment growth. However, such high growth is mostly driven by the entry of very small enterprises, which is offset by job destruction of a similar magnitude [68].

The indicator measuring the age of the enterprises (3-year-old enterprises) has a positive and statistically significant relationship with national competitiveness for all three models. The higher number of young enterprises will determine an increase in national competitiveness, regardless of the group of countries we are considering. This is explained by the fact that young enterprises, which are usually SMEs, are the largest contributor to job creation and employment growth with positive effects on the economic development of countries [43,44]. In older enterprises, the owners might lower their commitment and involvement compared to young enterprises. Thus, an enterprise’s performance is usually diminished as the enterprise ages [45–47,69,70].

The indicator measuring the average size of five-year-old enterprises represents the ratio between the number of employees in young companies that have survived for three years and the number of companies that have survived for 5 years. According to our results, this indicator appears to have a positive and statistically significant relation with national competitiveness in the case of innovation countries and a negative relation for the transition countries. These results can be explained by the fact that, in developed countries, larger enterprises can spread investment costs over greater output so that returns of those investments will enhance competitiveness [71]. In the countries in transition, taking into account the business environment characteristics (such as lack of access to certain resources and capabilities), even if the enterprises were larger, no positive effects on national competitiveness would be felt.
The other variables such as net business population growth and 5-year-old enterprises do not result in a statistically significant influence on global competitiveness index.

From the control variables included, education and population have a positive and statistically significant effect on the global competitiveness index, regardless of the group of countries analysed. The variable measuring resource endowment did not significantly influence the competitiveness of countries.

The value of R-squared adjusted for Model A is between 0.50 and 0.61. This result shows that between 50 and 61% of the change in the competitiveness of EU countries can be explained by the variation in the indicators measuring entrepreneurial performance. For Model B, around 97% of the variation in competitiveness in innovation-driven EU countries can be explained by the changes in entrepreneurship performance. For the transition countries, around 70% of the variation in competitiveness can explained by the entrepreneurial performance dynamics.

Moving on to the second part of our empirical analysis, for identifying the best model that explains the link between entrepreneurial performance and economic growth, we ran the regression analysis by applying on our sample three different models: ordinary least squares, fixed effects model and random effects model. We obtained three models, each one analysing a different group of countries: total 27 EU countries—Model D—innovative economies—Model E—and economies in transition—Model F.

As summarised in Table 6, the results are different for each model. Therefore, we have tested to see which model best describes the relation between variables. We ran two tests: the Hausman test and the redundant fixed effects test.

### Table 6. Effects of entrepreneurial performance on economic growth

| Dependent Variable | 27 EU Countries (Fixed Effects) | Innovation Countries (Fixed Effects) | Transition Countries (Fixed Effects) |
|--------------------|-------------------------------|-----------------------------------|-------------------------------------|
|                    | Model D1 | Model D2 | Model E1 | Model E2 | Model F1 | Model F2 |
| Birth              | 0.315 (0.264) | - | -0.007 (0.005) | - | 0.037 ** (0.360) | - |
| Death              | - | -0.005 *** (0.005) | - | 0.542 *** (0.404) | - | 0.452 * (0.404) |
| Bpop               | 0.075 *** (0.089) | 0.182 *** (0.058) | 0.003 (0.005) | 0.296 (0.124) | 0.270 (0.177) | 0.296 (0.124) |
| Surv3              | 0.049 (0.043) | - | 0.001 (0.001) | - | 0.046 (0.113) | - |
| Emp13              | 0.347 (0.346) | - | -0.024 (0.012) | - | -0.470 *** (0.041) | - |
| Old3               | - | 0.135 (0.062) | - | 0.288 (0.183) | - | 0.288 (0.183) |
| Old5               | -0.157 (0.159) | - | -0.006 (0.005) | - | -0.212 (0.161) | - |
| Size5              | - | -0.963 (0.263) | - | -0.222 (0.214) | - | -0.222 *** (0.214) |
| Educ               | -0.351 (0.499) | -0.558 (0.416) | -0.115 *** (0.031) | -0.975 (0.641) | -0.177 (1.021) | -0.975 (0.641) |
| Lpop               | -3.652 *** (3.663) | -2.899 *** (0.654) | -1.970 *** (0.494) | -6.101 *** (0.264) | -6.322 *** (0.520) | -6.101 *** (0.264) |
| Res                | 1.074 *** (0.390) | 1.335 ** (0.683) | 2.030 ** (0.117) | 2.511 ** (0.449) | 1.339 ** (0.614) | 2.511 ** (0.440) |
| Obs                | 186 | 189 | 129 | 133 | 129 | 133 |
| R-squared          | 0.727 | 0.714 | 0.799 | 0.743 | 0.563 | 0.713 |
| R-squared adjusted | 0.652 | 0.640 | 0.729 | 0.664 | 0.508 | 0.660 |
Table 6. Cont.

| Dependent Variable | 27 EU Countries (Fixed Effects) | Innovation Countries (Fixed Effects) | Transition Countries (Fixed Effects) |
|--------------------|---------------------------------|--------------------------------------|------------------------------------|
|                    | Model D1                        | Model D2                             | Model E1                           | Model E2 | Model F1 | Model F2 |
| F-statistic        | 9.69 ***                        | 9.57 ***                             | 41.32 ***                          | 9.45 *** | 2.35 *** | 9.74 *** |

Note: *, ** and *** represent 10%, 5% and 1% level of confidence, respectively. The statistically significant coefficients are in bold. Source: authors’ own work.

For Model D, the results of the Hausman test point out that the H0 hypothesis (H0: random effects are preferred) is strongly rejected, because the $p$ value is equal to 0.000. On the other hand, the results for the redundant fixed effects test show that the fixed effects are preferred because $p$ values are less than 0.05 and we reject the null hypothesis (H0: the fixed effects are redundant). Thus, the model that is a better fit for variant D is the fixed effects model.

For Model E, including only the innovation EU countries, the results of the Hausman test indicate that the H0 hypothesis (H0: random effects are preferred) is strongly rejected ($p$ values = 0.000). After running the regression with fixed effects and applying the redundant fixed effects test, we observe that the null hypothesis is rejected ($p$ values < 0.05) (H0: the fixed effects are redundant). Therefore, the fixed effects are statistically significant for Model E.

For the model that includes the transition countries (Model F), we obtained similar results to those of the other models. Therefore, we conclude that fixed effects are the best fit for Model F.

The results of the fixed effects models emphasise the existence of a significant relationship between some of the indicators measuring entrepreneurial performance and economic development. They also show that this relationship is different according to the economic situation of the countries analysed. These findings confirm our hypotheses (H3 and H4).

In the following, we analyse each indicator in turn. Our findings emphasise that enterprise birth rate has a positive relation with economic growth for all groups of countries considered, but this relation is statistically significant only for the transition ones. Our results are supported by the findings of other studies [59,72,73] which highlight that the entry of new enterprises on the market creates the premises for the introduction of new ideas and innovation which would represent a source of long-term economic growth. Additionally, entrepreneurs are considered agents of change and bring new ideas to markets and stimulate growth through a process of competitive firm selection [35]. The formation of new, independent firms is important for the development of regional economic well-being [74].

The indicator measuring death rate resulted in a negative and statistically significant relationship with economic growth for the group of 27 countries. When grouping the countries, the results show a positive and statistically significant relationship between death rate and economic growth for both innovation and transition countries.

The interpretation of the relationship between enterprise death rate and economic growth in the literature shows that there can be both a positive and a negative relationship. Thus, on one hand, higher exit rates determine a reduction in the number of competitors. The firms that remain on the market will face less competition, and will no longer have the same motivation to invest much in their development and innovation. All this will have negative effects on economic growth.

On the other hand, higher exit rates can have beneficial effects on economic growth. If those companies that leave the market are non-performing companies, their maintenance in the economy would not help in any way. Thus, the relationship between exit rates and economic growth is positive when the death of enterprises in fact implies a cleansing of the economy of non-performing enterprises. Enterprise deaths are not harmful to the economy because they can be seen as a catalyst that ensures the continuous regeneration of the stock of enterprises in the economy. In addition, the dynamics of the firms on the
markets allow the exploitation and exploration of new technological and entrepreneurial opportunities [40]. Moreover, enterprise exits might indirectly stimulate enterprise entry by releasing resources into the economy [41,42], with positive effects on economic growth.

At the same time, we can explain the positive relation between death rate and economic growth through the idea of creative destruction. As shown by [75], creative destruction of the existent enterprises on the market can have beneficial effects on the economy as a whole, but in correlation with other economic factors.

The net business population growth has a positive relation with economic growth for all three models considered, but is statistically significant only for the group of all 27 EU countries. The net business population growth will generate positive effects on economic growth because it is seen as a value-added generator (through investment and innovation). Each new enterprise (seen as a combination of factors of production) is based on the principle of economic rationality and efficiency, increasing the number of enterprises that will contribute to GDP growth and thus to economic growth. The practical proof of the contribution of the net business population to economic development is that most countries have adopted policies that encourage the creation of new businesses. Empirical evidence was also provided by [76], who argued that new businesses promote innovation and facilitate the introduction of new technologies, which ultimately translates into an increase in the overall performance of the economy. Addressing the issue from the perspective of start-ups, [77] revealed that the establishment of a new enterprise (and, implicitly, the generation of new jobs) is one of the key factors influencing economic growth.

Our results also emphasise a negative relationship between employment share at 3 years and economic growth for all three groups of countries, but the relation is statistically significant only for the transition countries. Thus, an increased share of individuals employed in young enterprises might be seen as a reduction in the number of employees in older companies on the market. The reduction can be either due to the exit from the market of the old companies or a reduction in the number of jobs offered by them due to the restricted activity. This negative evolution of the old companies on the market will generate negative effects on economic growth. A one percentage point increase in the share of large firms to total employment is associated with a 0.34 percentage point decrease in entrepreneurial activity, 0.21 percentage points for opportunity-driven entrepreneurs and 0.10 percentage points for necessity-driven entrepreneurs, keeping all other factors constant [78]. In addition, there is an expected 0.53 percentage point decrease in entrepreneurial intentions with a higher large firm dominance, other factors remaining constant.

The indicator measuring the average size of five-year-old enterprises has a negative and statistically significant relationship with economic growth only for the group formed by the transition countries. A possible explanation of this result is related to the findings of [79] which show that increased size of the firms negatively impacts on their growth. If the growth of the firms is affected, this might generate negative effects on economic growth. This result obtained for the transition countries could be related to the poor quality of the institutional environment, reflected, for example, by a series of both financial and regulatory constraints, which led to the high share of grey economy, corruption, unfair competition, etc. [80]. The other variables did not have a statistically significant influence on economic growth for any of the analysed models.

From the control variables included, population and resource endowment have a statistically significant effect on the economic growth, regardless of the group of countries analysed. While resource endowment has a positive effect, the population size has a negative effect. The variable measuring education did not significantly influence the economic growth of the countries.

The value of R-squared adjusted for Model D is 0.65, and shows that 65% of the change in the economic growth of the EU countries can be explained by the changes in entrepreneurial performance. For Model E, between 66% and 72% of the variation of economic growth in innovation-driven countries can be explained by the changes in entrepreneurial performance. For the transition countries, analysed in Model F, between
50% and 66% of the variation in economic growth can be explained by the dynamics of the entrepreneurial performance.

5. Conclusions

In this paper, we aimed at investigating the impact of changes in the entrepreneurial performance on national competitiveness and economic growth when the stage of economic development of countries is different.

Our findings confirm the four hypotheses formulated and point out the significant role played by a sustained entrepreneurial performance for increasing the competitiveness and economic growth of countries. Additionally, the results draw attention to the fact that this relationship is different according to the economic situation of the analysed countries. The empirical results point out that a large number of the indicators measuring entrepreneurial performance significantly influence the competitiveness and economic growth of the EU countries. The results of our research show that, at the level of the 27 EU countries, the indicators measuring death rate and employment share at 3 years are negatively related to national competitiveness. At the same time, the indicator measuring the age of enterprises is positively related to competitiveness. When considering the countries grouped according to their GDP per capita, we obtained different results. The national competitiveness in the case of innovative countries is positively influenced by birth rates, the survival rate at 3 years, the share of 3-year-old enterprises and the average size of 5-year-old enterprises, and negatively influenced by death rate and employment share at 3 years. For the transition countries, national competitiveness appears to be positively related to birth rate and the share of 3-year-old enterprises, and negatively to the survival rate at 3 years, employment share at 3 years and average size of 5-year-old enterprises.

The second part of the study focuses on economic growth. Our findings show that for the 27 EU countries analysed, death rate is negatively related to economic growth while net business population growth is positively related. For the innovation countries, the economic growth is positively influenced only by the death rate of enterprises. In the case of transition EU economies, the economic growth is positively influenced by enterprise birth and death rates and negatively influenced by employment share at 3 years and the average size of 5-year-old enterprises.

The added value of our study results from including in the analysis an extended sample of 27 EU member countries. Moreover, grouping them according to the stage of development allows us to perform comparative studies and the identification of a set of particularities for each category of countries. Another novelty that we bring through this paper is the fact that we have included in the analysis the indicators measuring the performance of entrepreneurship, and we have analysed their relationship with national competitiveness and economic growth. In the literature, there are no studies that have analysed the effects of entrepreneurial performance on national competitiveness and economic growth by groups of countries. Therefore, through this research, we intended to fill this literature gap. If we can identify which performance indicators influence economic growth and national competitiveness, then decision makers can know in which direction they should intervene and formulate policies. Thus, for example, if the survival rate of firms plays a significant role for the economy as a whole, decision makers should formulate policies to help keep firms in the market. This is similar in the case of the other indicators analysed. From the empirical results, we observe that there are countries where the death rate has positive effects, and here the decision makers should intervene through policies and measures to keep the innovative, competitive companies on the market.

Overall, our research emphasises the need to adopt public policies that will promote and stimulate entrepreneurial performance or that will sustain the entry of new entrepreneurs into the market. Our study also points out the need to develop specific programs that support the survival of enterprises that develop innovative and high-quality activities. Thus, our findings could be of interest to policy makers who intend to develop measures to enhance national competitiveness and economic growth.
The limitations of the present study come from the fact that data were not available for all 18 indicators proposed by the Entrepreneurship Indicators Programme to measure entrepreneurial performance. This study represents a starting point of our research regarding the effects of entrepreneurial performance on national competitiveness and economic growth of countries. We intend to extend and develop our analysis to deepen the empirical investigation by adding other indicators (such as the idiosyncrasy of the job market in the countries under study, similar to Bąk-Grabowska 2014 [81]) for measuring entrepreneurial performance but also to expand the sample of countries by including in the analysis a group of countries outside the European Union. Another limitation of this paper comes from the fact that the study was conducted on the ranking of countries according to their economic development at the time of its initiation. In future studies, we intend to consider the migration of countries between categories that occurs from year to year.

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