

Investment Indicators and the Business Firms Dynamics

Virginia CUCU¹

ABSTRACT

The paper regards the link between the population of enterprises carrying out economic activity and pursuing investment projects of all sorts. The business demography statistics focusing on real enterprises population's events (such as births and deaths) is analyzed in terms of its descriptive statistical appearance in Romania to point out the divergent patterns as compared to some aggregates at the European Union level. Starting from the evidence that business dynamics revealed by the business demography statistics is a key source of information for analyzing the prospects of business and entrepreneurial activity, the paper suggests using a well known statistical measure – the z score to address the subject of the specific historical pattern in the companies' demography in Romania. The usage of enterprise birth rates, death rates and the two-year survival rates is chosen for statistical analysis as they are part of the structural indicators used to monitor the progress of the Europe 2020 agenda. The investment rate which is one of the key indicators for economic sector is provided for the euro area and some EU state members.

KEYWORDS: *business demography indicators, investment rate*

JEL CLASSIFICATION: *D01, D22*

INTRODUCTION

The relevance of the relationship between the investment rate indicators and the demographic behavior of the companies is increasing in the context of the turbulent economic climate in the last years. Unfortunately, not sufficient statistical data are available to indicate the specific form of this interaction. The population of enterprises performing economic activity is important as its dimension influence the volume of investments carried out in the domestic economy. In time, there are significant changes in the population's size enterprises within the business economy, reflecting the entrepreneurial propensity of the individuals, the market conditions, the level of competition, and the general business environment the easiness of doing business. For example, the creation of a new enterprise generally leads to new products or services being offered in a marketplace and to new circumstances that lead to new investments, for research and development, innovation, developing new products and services.

Although the investment volumes may be very volatile at enterprise level, the concern for an analysis of volumes, dynamics and patterns derive from the economic theory suggesting that relatively large numbers of enterprise births are likely to be associated to a green light for further investment projects. This means that the businessmen have good anticipations and there are low barriers to entry on a current state of the local market. Where barriers to entry (and exit) are lower, as is the case for many services and construction activities, there are generally higher levels of enterprise birth and deaths.

¹ The Artifex University Bucharest, Romania, E-mail: virginia_cucu@yahoo.com

This paper presents the evolution patterns of business demography with data from Eurostat covering Romania versus some averages in the EU27 region over the most recent period. The analysis is based on a selection of indicators derived from national accounts that illustrate the investing behavior of non-financial corporations.

The population of business enterprises evolves due to mergers, break-ups, splits or the restructuring of enterprises, including changes that derive from changes in the enterprise's principal (main) activity. In the macro and micro environment, special attention is paid to the impact of these demographic events on employment levels. For defining the population of active enterprises, one should monitor the businesses that had either turnover or employment at any time during the reference period.

The paper uses evidence from statistical databases in Eurostat regarding the enterprise births, deaths and survival rates following the commonly agreed definitions and methodology. Eurostat section on business demography statistics presents data on: the active population of enterprises; their rate of birth; their survival (followed up to five years after birth), and the rate of death.

In the Eurostat database, the table named "Annual sector accounts" consists of two main dimensions: for *households* (reporting the following indicators: saving rate, investment rate, gross debt-to-income ratio and net financial wealth) and for *non-financial corporations* with the following indicators: investment rate, profit share, gross return on capital employed before taxes, net debt-to-income ratio after taxes and net return on equity after taxes.

The gross investment rate of non-financial corporations is defined as gross fixed capital formation divided by gross value added and it relates the investment of non-financial businesses in fixed assets (buildings, machinery etc.) to the value added created during the production process (Leythienne & Smokova, 2009). In terms of *business investment rate*, in the view of Eurostat, the gross investments rate of non-financial corporations were decreasing in EU27 and revealing more stable in the euro area. In 2011, the gross investment rate of non-financial corporations was 20.19% in the EU27; as well, in the **euro area**, the investment rate was 20.59% - figure 1 (Eurostat, 2012).

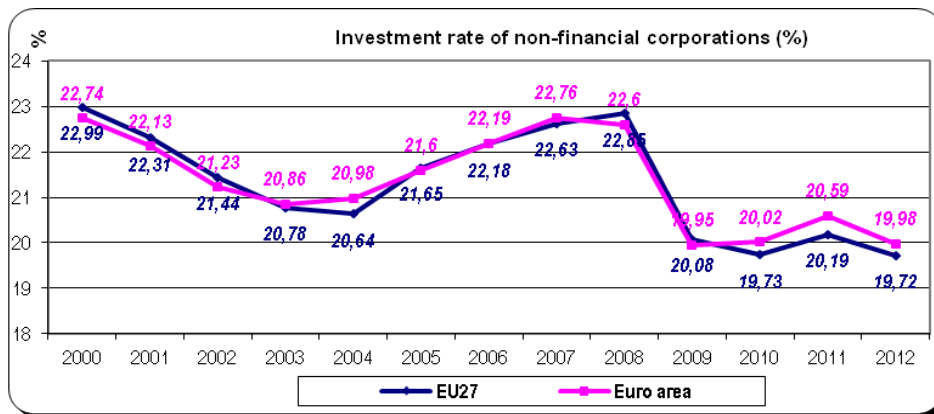


Figure 1. The evolution of the investments rate of non-financial corporations (%)

Source: Eurostat (tec00099)

The dynamics of the indicator reveals the decrease in variation from a standard deviation of 6.26 in 2000 to the 5.01 in 2011.

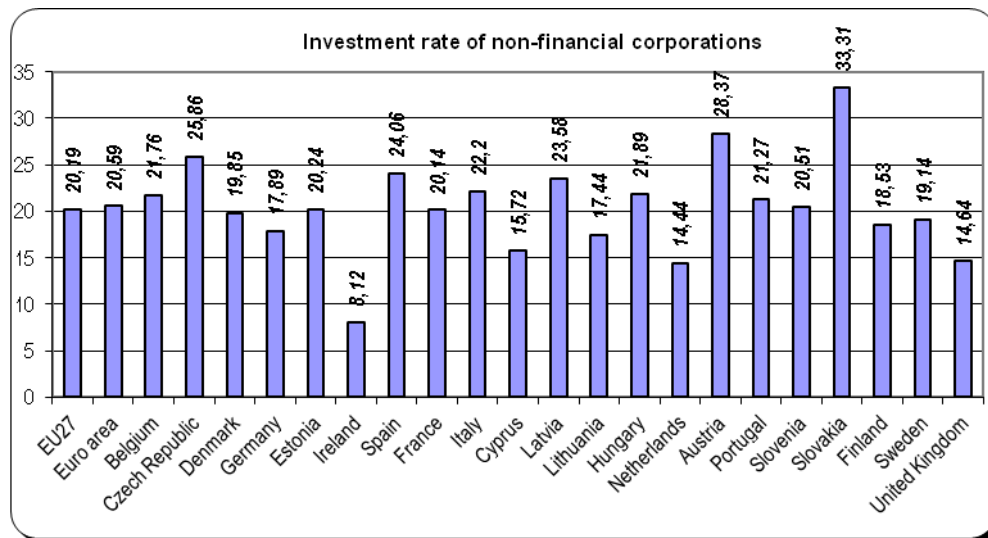


Figure 2. The distribution of investment rates for non-financial corporations in 2011 (%)

Source: Eurostat (tec00099)

The investment rates showed sizable disparities across Europe in 2011, this can be partly explained by the relative importance of capital intensive industries in the structure of the different economies. Highest investment rates in Slovakia (33.31%), and Austria (28.27%) and the lowest investment rates in the Netherlands (14.44%) and the Ireland (8.12%). For the figure 2, some countries are missing: Bulgaria, Greece, Luxembourg, Malta, Poland and Romania.

1. THE INDICATORS FROM BUSINESS DEMOGRAPHY STATISTICS

Business demography data can be used to analyze the dynamics and innovation of different markets, for example: entrepreneurship in terms of the propensity to start a new business, or the contribution of newly-born enterprises to the creation of jobs (Brandt, 2004). It contains information relating to *business births* (business entries); *business deaths* (business exits) and the *business survival rates* (all these variables are expressed as ratios of total businesses or businesses born in the reference period).

As defined by Eurostat manuals (European Commission, 2007), an enterprise's birth deals with the event of creating a new combination of production factors with the restriction that no other enterprises are involved in the event. The *birth rate* indicator is computed as the number of enterprise births in the reference period (t) divided by the number of enterprises active in t . The *death rate* is computed as the number of enterprise deaths in the reference period (t) divided by the number of enterprises active in t . An *enterprise survival* occurs if an enterprise is active in terms of employment and/or turnover in the year of birth and the following years. The survival rate is calculated as the number of enterprises in the reference period (t) newly born in $t-2$ having survived to t divided by the number of enterprise births in $t-2$.

For the total business economy (excepting the financial and insurance activities), there are several indicators that are registered: number of enterprises, turnover or gross premiums written, production value, value added at factor cost, gross operating surplus (Bartelsman et al., 2009). These indicators are reported for high-technology manufacturing, medium high-technology manufacturing, medium low-technology manufacturing, low-technology manufacturing and knowledge-intensive high-technology services, knowledge-intensive market services.

The main information source is the Eurostat data base regarding the following reported indicators: *number of employees* in the year of enterprise birth, *number of units having survived* from 2002 to 2005 and the *start-up type* - new enterprise, reactivation after more than 2 years (all figures in 2005). The data regards to the enterprises in the industry and services sectors (except management activities of holding companies; public administration and community services; activities of households and extra-territorial organizations) for the EU countries (Bulgaria, Czech Republic, Denmark, Estonia, France, Italy, Latvia, Lithuania, Luxembourg, Austria, Portugal, Romania, Slovenia, Slovakia Sweden) (Moncada, 2011).

Table 1 represents the data series for the three indicators for Romania in the period 2002-2009 as they are reported by the Eurostat. In figure 3, the same information is given to point out the variability in the data series – more fluctuations correspond to the birth rate (standard deviation $SD=3.80$); its fluctuant dynamics is associated to the survival rate evolution ($SD=5.82$). A less variable evolution has the death rate indicator ($SD=2.98$), yet the time period for the available data ends in 2009, not including the turbulence if the world financial and economic crisis.

Table 1. The business demography indicators for Romania

Type of event	2002	2003	2004	2005	2006	2007	2008	2009	2010
Birth rate	12.59	18.74	18.96	18.29	14.56	15.62	14.66	9.48	8.71
Death rate	11.61	11.31	9.87	10.46	8.61	8.73	10.37	18.01	
Survival rate	70.96	69.62	76.87	78.6	77.61	75.93	77.23	74.02	60.62

Source: Eurostat (tin00142)

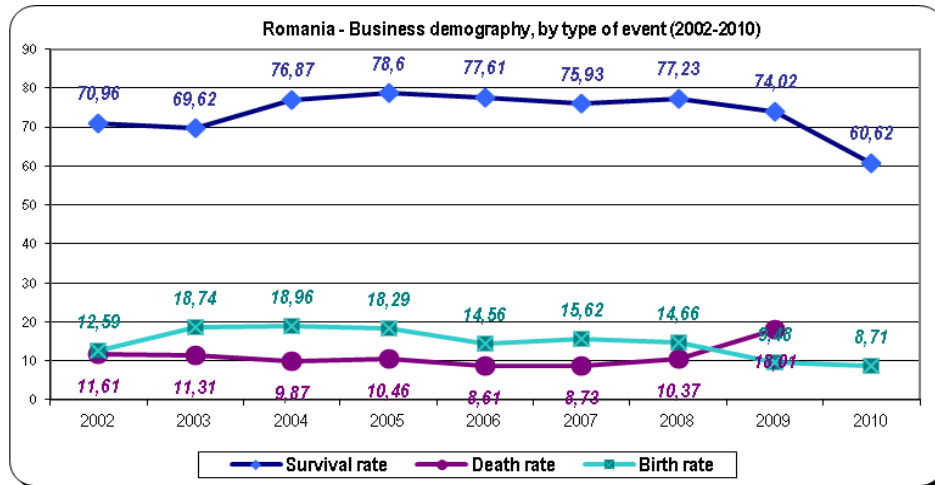


Figure 3. Evolution for business demography indicators for Romania (2002-2010)

Source: Eurostat (tin00142)

Table 2. The dynamics of the business demography indicators and of the investment rate (2002-2010)

Indicator	Average	Standard deviation (SD)
Type of event		
Birth rate - average	14,62	3,80
Death rate	11,12	2,98
Survival rate	73,50	5,72
Investment rate		
Average growth	23.93	6.22

Source: own computations

As it is reported by the Eurostat, the following units are missing from the data series: EU (27 countries), Denmark, Greece and Malta. The enterprise birth rates in 2009 are displayed from 3.04% in Cyprus and Belgium 94.58% (the lowest values) to above 15% - in Bulgaria (17.62%), Latvia (16.42%), Slovakia (16.34%) and France (15.35%).

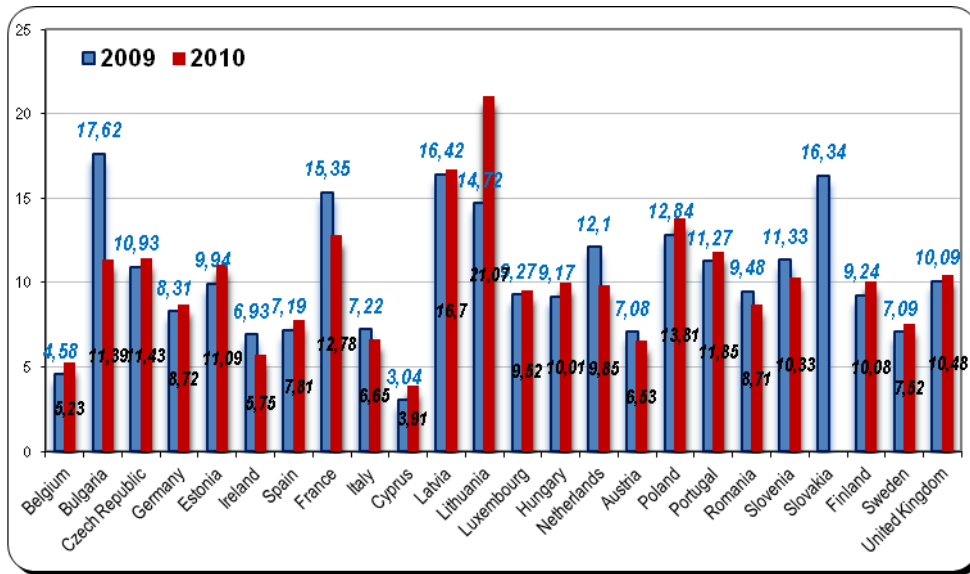


Figure 4. The distribution for values of birth rate in 2009 and 2010

Source: Eurostat (tin00142)

For the death rate indicator, in the reports of the Eurostat, also, some units are not included with specific data: EU (27 countries), Denmark, Germany, Greece and Malta. The enterprise death rates in 2008 (the latest comprehensive data series) ranged from 2.38% in Cyprus and 4.22% in Belgium (the lowest values) to the highest values, namely, 17.04% in Portugal and, even, 38.08% in Lithuania.

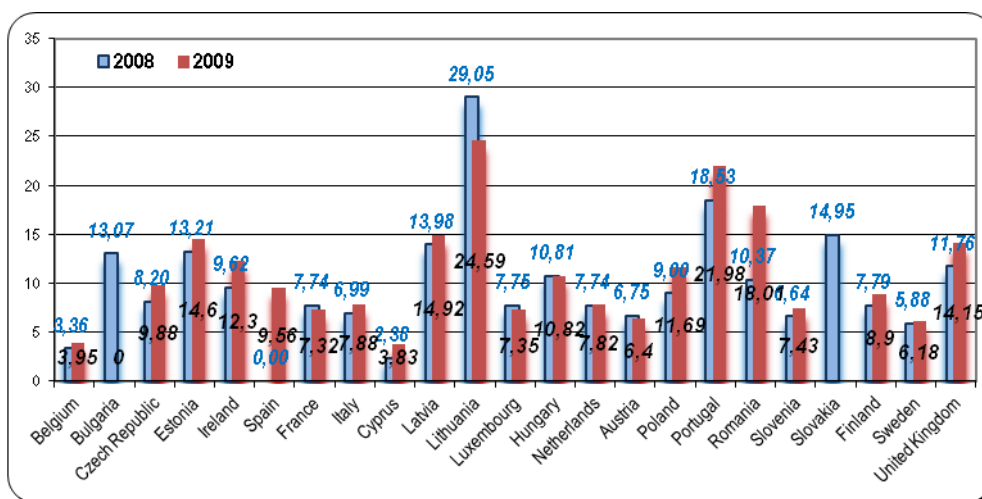


Figure 5. The distribution for values of death rate in 2008 and 2009

Source: Eurostat (tin00142)

Figures 4 and 5 show the birth and death rates across a range of NACE sections based on averages compiled from those Member States for which data are available. Both are more detailed to the following indicator – the survival on a specific interval. In the reports of the Eurostat, the following units are missing: EU (27 countries), Denmark, Germany, Greece, Cyprus and Malta.

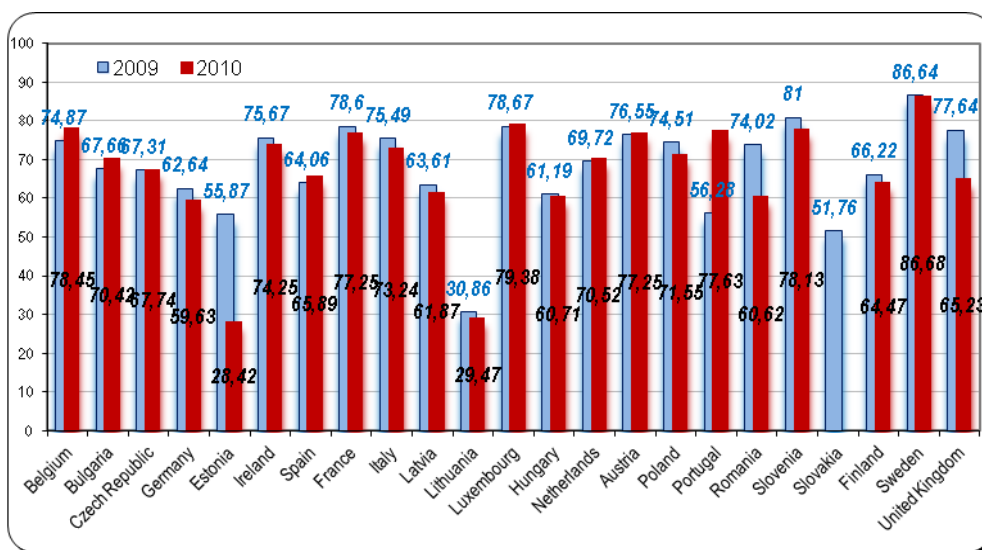


Figure 6. The distribution for survival rates (in %) in 2009 and 2010

Source: Eurostat (tin00142)

The survival rate for enterprises were in 2009 (the latest comprehensive data series) ranged from 30.86% in Lithuania and 51.76% in Slovakia (the lowest values) to 86.64% in Sweden and 78.678% in Luxembourg – figure 6.

2. THE ROMANIAN PROFILE OF ENTERPRISE BEHAVIOR VERSUS THE EUROPEAN UNION AVERAGE

In the following section, several facts about Romanian place in the distribution of the European state members are described. The indicators relate to the number of employees (figure 7), the number of enterprises that survived in the period 2002-2005 (figure 8) and two of the star – up indicators (figure 9) (European Commission, 2011).



Figure 7. The distribution of number of employees in the year of enterprise birth
Source: Eurostat (fobs_isc)

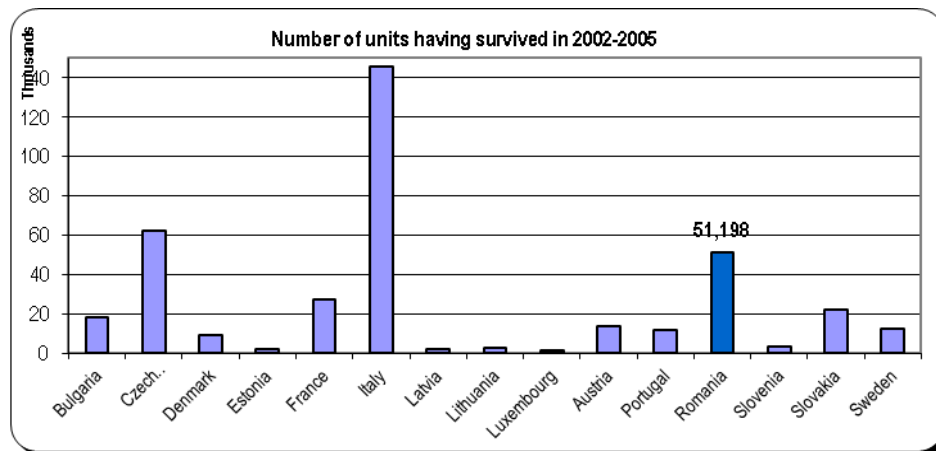


Figure 8. The distribution of number of units surviving during interval 2002-2005
Source: Eurostat (fobs_isc)

The total figure of start-up companies in EU is 324,729 as the new enterprises and 8586 of reactivated enterprises after more than two years (2005).

The following aspects are regarded in comparison to the EU25; as expected, Romania departs from European tendency in many aspects. The paper uses the comparison analysis based on the *Z-score* measuring the number of standard deviation (*SD*) units a value deviates from the mean (\bar{x}):

$$Z = \frac{X - \bar{X}}{SD} \tag{1}$$

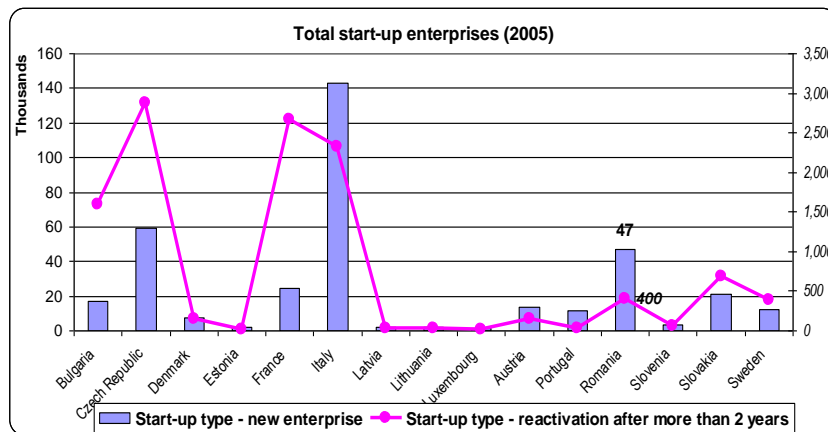


Figure 9. Start-up type indicators

Source: Eurostat (fobs_isc)

As it is known, the *Z-score* represents the number of *SD* units a given score *X* deviates above or below the mean score; the computations were performed computing the average on the country sample, and using the reported value for the EU25 (at the time of the reported indicators). As the *Z-scores* between -2.00 and +2.00 are considered relatively ordinary, the attention is paid to the values with the highest absolute value – stating an uneven behavior of specific indicators (for Romania, in our case) as compared to the EU averages.

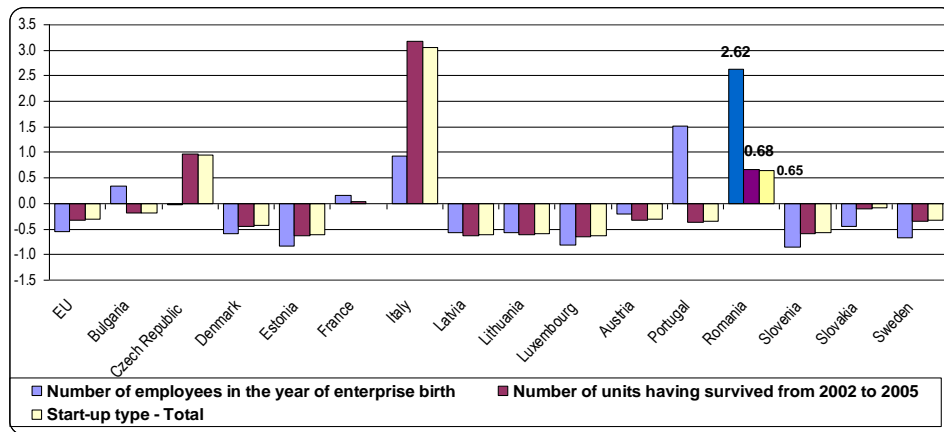


Figure 10. The z scores for the number of employees in the year of enterprise birth, number of units surviving during interval 2002-2005 and start-up type indicators

Source: own computations

Figure 11 shows the start-up motivations of the entrepreneurs by age group. Multiple answers were allowed for respondents to this question; in describing the business statistics on *Start-up motivation* (Haltiwanger et al., 2009), the following categories are reported: desire for new challenges, desire to be one's own boss, desire to make a living from a hobby activity, tradition for self-employment in the family, combining work and private life, children are big enough, prospect of making more money, realizing an idea for an new product or service, reaching an international market, avoiding unemployment, getting away from unsatisfactory work situation, working as sub-contractor exclusively for former employer, only possibility to carry out profession; all of them are registered as percentage from the total population. There are a large number of categories that departs Romania from the European average: desire for new challenges ($z=0.89$), desire to make a living from a hobby activity ($z=1.04$), combining work and private life ($z=1.28$) and children are big enough ($z=1.79$) (figure 11).

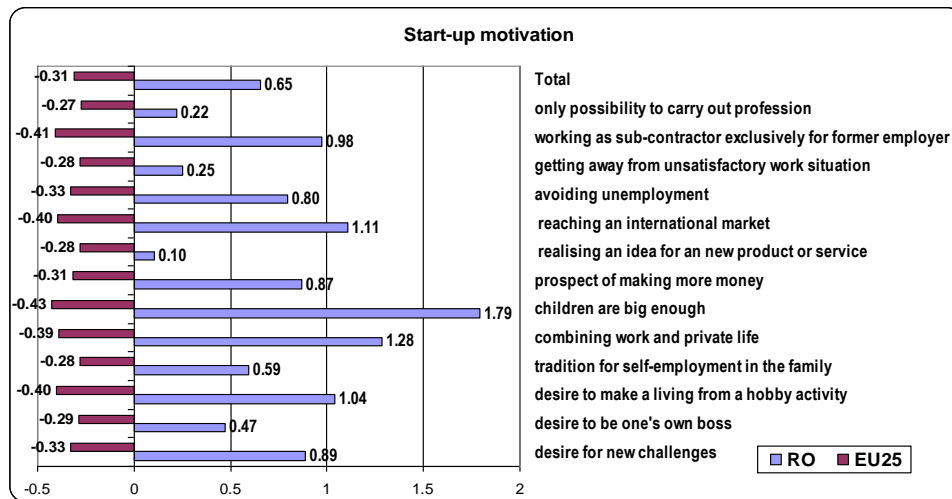


Figure 11. The start-up motivation indicators (2005)

Source: Eurostat (fobs_isc)

For *start-up financing*, the list of categories include: own funds or savings, financial assistance from family or friends, bank loan without collateral, bank loan with collateral, capital contribution from other enterprises, venture capital, financial support from public authorities (figure 12). It is seen that there are categories at which Romania reports remote figures from the European average: financial support from public authorities ($z=0.68$), own funds or savings ($z=0.75$) and financial assistance from family or friends ($z=1.03$).

Regarding the *start-up difficulties*, the statistical database reports on the following issues: to get financing, to establish contacts with customers, to obtain payment for outstanding invoices, to price goods or services, to find suitable premises, to find suppliers, to get suitable personnel, to use information technology effectively, to deal with legal / governmental / administrative matters, to be alone as an entrepreneur, to get backing from spouse or family (figure 13). Among the difficulties encountered by Romanian managers, the largest deviation is encountered for the "finding supplies" category ($z=1.76$), followed by the "finding suitable premises" ($z=0.87$).

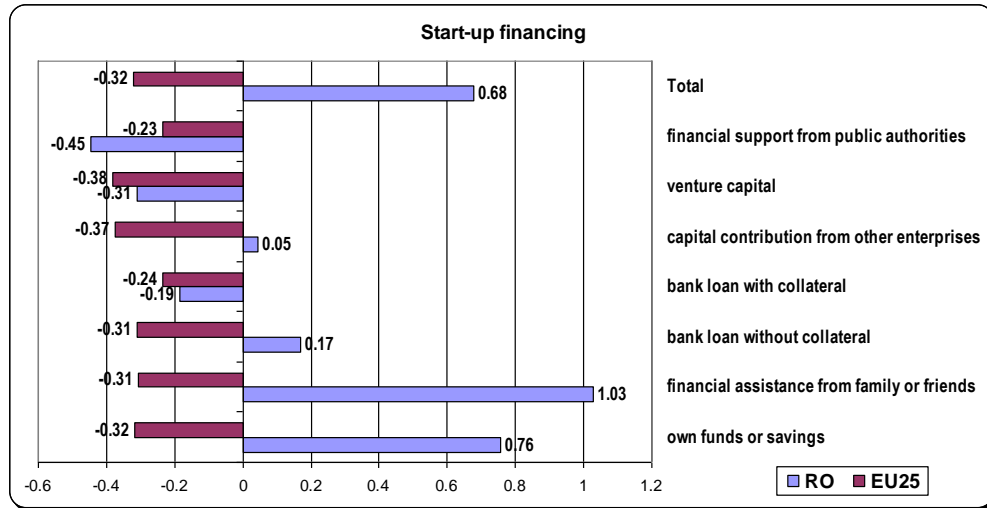


Figure 12. The start-up financing sources (2005)
Source: Eurostat (fobs_isc)

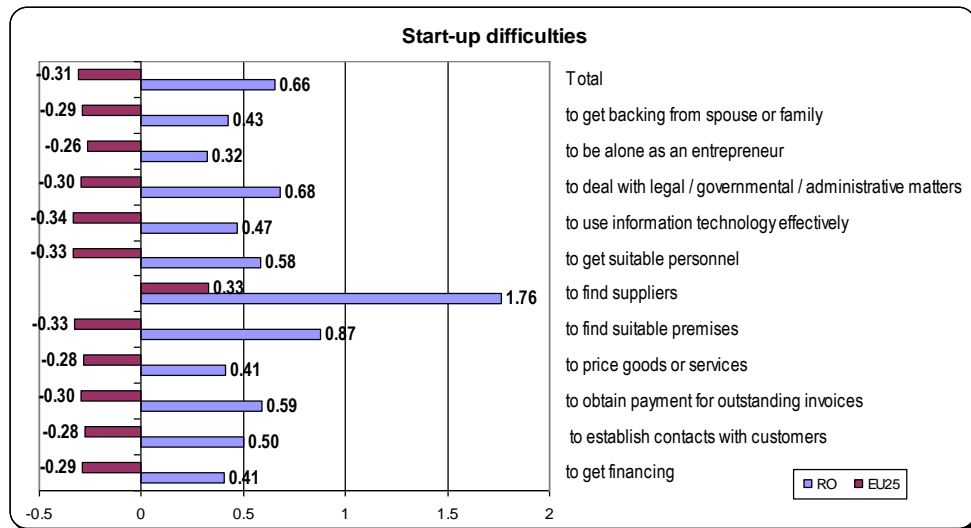


Figure 13. The start-up difficulties' indicators (2005)
Source: Eurostat (fobs_isc)

Describing the profitability, the judgment is expressed as: *very good, good, barely sufficient, poor* (figure 14). Turning to entrepreneurs' assessment of the profitability of their enterprise, their judgment does not seem to be very optimistic. Romanian managers of enterprises are quite extreme as compared to other countries' assessments – the z values is 0.26 for the “*poor*” category and $z=1.08$ for the “*very good*” category.

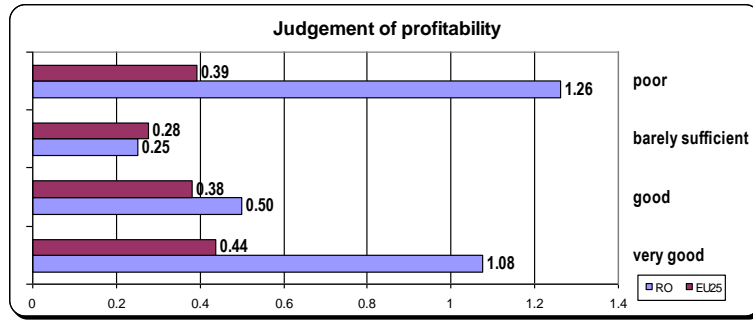


Figure 14. The start-up indicators for the profitability (2005)

Source: Eurostat (fobs_isc)

The enlisted *impediments to selling products or services* - competition too vigorous, too little demand, difficult pricing, lack of marketing skills. In the above mentioned list Romania tend to behave differently as compared to the average figures of the EU, the z-scores are all positive and some of them quite significant – for example, in the skills issues ($z=1.11$), stating that managers of Romanian enterprises associate a higher intensity to the these categories of barriers obstacles in the process of selling products and services.

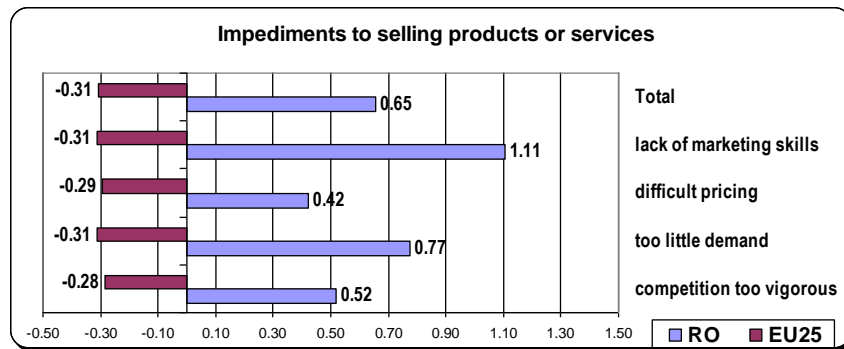


Figure 15. The indicators for impediments to selling products or services (2005)

Source: Eurostat (fobs_isc)

The enlisted *impediments to developing the business activity* are: profitability, availability of bank loans, availability of risk capital, availability of short term credit, availability of qualified personnel, staff costs, regulatory and administrative burden, adapting to new technical standards, availability of managerial competences, combining family and work, finding partners, non or late paying customers. In the above mentioned list Romania tend to behave differently as compared to the average figures of the EU, the z-scores are all positive and some of them quite significant, stating that managers of Romanian enterprises associate a higher intensity to the various categories of obstacles in the company’s development.

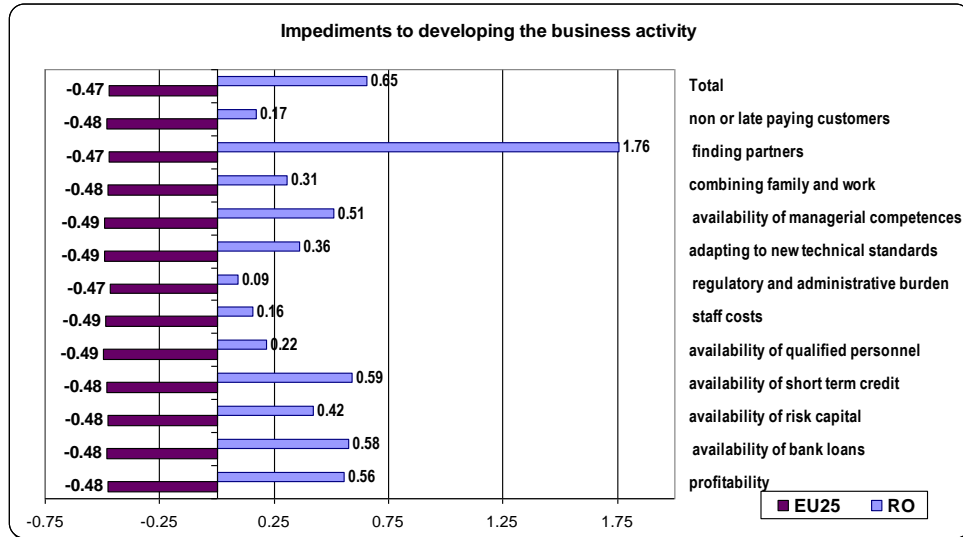


Figure 16. Impediments to developing the business activity (2005)

Source: Eurostat (fobs_isc)

Strategic plan's indicators relate to the next categories: continuing the enterprise, affiliation, close and start new enterprise in the same activity, close and start new enterprise in another activity and close without starting new enterprise. For Romanian managers, it is seems that intend to close the existing company and to start another one in a different field ($z=1.11$ exposing a high degree of discontent toward the current state of activity).

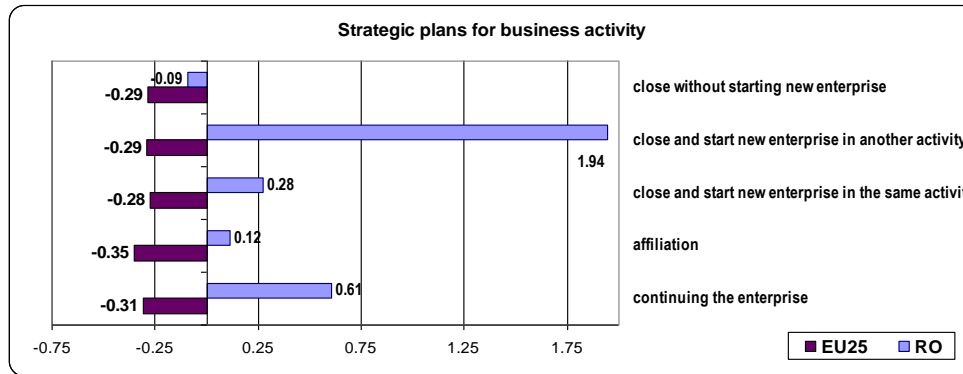


Figure 17. The intentions of strategic development (2005)

Source: Eurostat (fobs_isc)

Regarding the *expected line of developing the business*, the following directions are searched - increase of turnover, of number of employees, of profitability or of variety of goods and services for sale. For the Romanian enterprises, the declared emphasis is put on the increase of the number of employees ($z=1.94$). Figure 18 shows expectations about future increase of business.

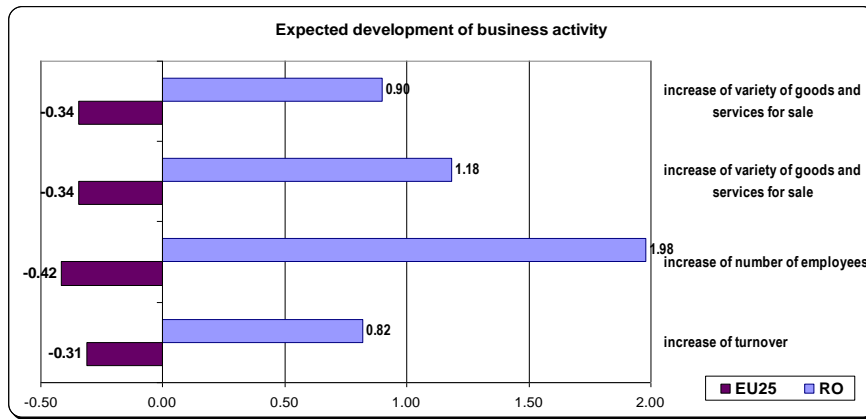


Figure 18. The expected way of developing the business (2005)

Source: Eurostat (fobs_isc)

Regarding the *highest priority in developing the business*, the following directions are monitored - hire more employees, increase remuneration of employees, invest in the activity of the enterprise, pay off loans or credits, increase own salary from the enterprise, reduce own working time. For the Romanian enterprises, the emphasis is put on the increase of the number of employees ($z=0.79$).

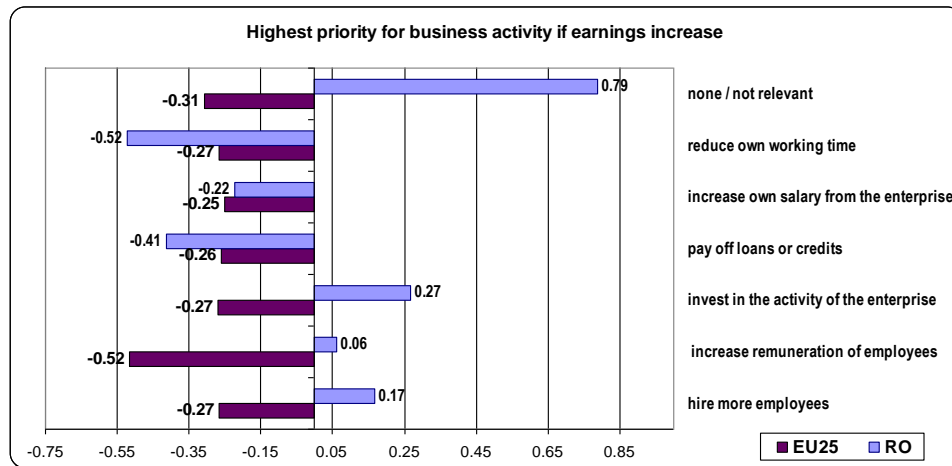


Figure 19. The highest priority given to a certain way of developing the business (2005)

Source: Eurostat (fobs_isc)

CONCLUSIONS

The data registered by the official statistical databases reveal many aspects of the growth behaviors of the companies, regardless the size or the activity sector. Yet, the drawn conclusion are subject to the registered issues and the time coverage – for example, in the present paper, the business demographic indicator related until the 2010 year, not reflecting the sudden changes brought by the incidence of the financial and economic world crisis.

The policy makers, academics and business advocacy groups are interested in the distribution of business growth and in the investment behavior of the companies in Europe. The paper presented a detailed analysis of the business demography and investment rate relationship regarding various aspects of the companies' dynamics (start up and growth aspects - mainly); the relation can be further developed by including levels of education for and innovation investment (beyond R&D), differentiating among sectors.

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