

INNOVATIVE BEHAVIOR OF SMALL AND MEDIUM ENTERPRISES DURING THE ECONOMIC CRISIS

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Abstract:

Innovation is an area increasingly attractive to most companies. During and after the crisis, more and more companies are trying to expand their business horizons, to change the organization to discover new products and services in order to maintain operational status, and this can be done only through innovation. The business environment in Romania was heavily influenced by the global crisis in the period 2008-2013: entrepreneurship has become vulnerable due to uncertainty of the economic environment and many SMEs have left the market. In order to survive in these conditions, many companies have had to change the way have worked, and was one of the means innovation. The European Union has undertaken studies that examined this issue for each country, as well as comparisons with other countries. This paper identifies the empirical relationship between innovation (both technological and organizational one) based on published outcomes of European Union-Directorate for Research and Innovation and SMEs in Romania results in this period. Hypothesis that released this paper is that innovation was one of the means by which companies remained in operation during the period 2008-2013. To verify this hypothesis, I will check the results of innovation indicators in Romania in the period 2008-2013 and will check which business organizations remain in operation during this period, based on my correlation between innovation, economic performance and entrepreneurial performance.

Keywords: *innovation, economic vulnerability, competitiveness, technological innovation, non-technological innovation*

JEL Classification: R12

1. Introduction

Innovation is an area increasingly attractive to most companies. During and after the crisis, more and more companies are trying to expand their business horizons, to change the organization to discover new products and services in order to maintain operational status, and this can be done only through innovation. To track results, the European Union conducted a survey called "Innovation Union Scoreboard" which were determined points which can be called innovation within a company, the dimensions of innovation and divided them into three broad categories "enablers" ("openers" - points that capture the main drivers of innovation performance external to the firm and the differences between three dimensions of innovation) and include "human resources", "research systems open, excellent and attractive" and "Finance and Support".

The second largest category is "Firm activities" ("The activities of the company" - captures the innovative efforts of the company and difference between the three dimensions of innovation) that includes "investment company", "Links and entrepreneurship" and "intellectual assets".

The third category is the "Outputs" ("Results" - captures the effects of innovative company) and includes "innovators" and "Economic Effects". Thus, based on these indicators, the European Union created the rankings and points each indicates improved state, in the annual publication "Research and Innovation Performance - Country Profile"

2. Methodology and data

The analysis in this article has been divided, in terms of methodology, the two distinct sides.

The first part outlines an innovative character analysis of companies in Romania and how its outcomes. For this, we used the results of the study undertaken by the

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European Commission - Directorate General for Research and Innovation study called "Research and Innovation Performance in Romania - Country profiles". I also used the research that underpins the analysis of innovation in Europe "Innovation Union Scoreboard 2013" issued by the European Commission all. Thus, this part outlines a methodology to collect and interpret the results.

To analyze companies that have survived have created a database of all active companies in 2008, at unique CUI using public data from the Registry of Commerce and Ministry of Finance. Then I checked how many of these companies have survived the end of the period. The definitions and indicators used in the statistical analysis of small business behaviour are those recommended by the OECD-Eurostat methodology (OECD-Eurostat, 2008). Active enterprises are all enterprises that had either turnover or employment at any time during the reference period. Employer enterprises are enterprises with at least one employee. In order to analyze the survival behavior of firms, we used several specific indicators for the business demography. The n-year survival rate for a particular year (t) refers to the number of n-year survival enterprises as a percentage of all enterprises with at least one employee for the first time in year (t-n). Enterprise birth rates are newly born enterprises as proportion of all active enterprises, while enterprise death rates are enterprise death as proportion of all active enterprises.

To make the analysis I needed a database as close as the real numbers as possible. The two sources for official numbers at the Tax Code level are the National Trade Register Office and Ministry of Finance.

So, I started by gather information from the National Trade Register Office. I kept only those who had declared a state of operation "operation" in the second column on the portal of the National Trade Register Office. These data are public, official, free in the limit of an account and are updated at every submission of supporting documents. I excluded those who had declared: "radiant", "temporary interruption of work", "liquidation", "dissolution", "is subject to Law no. 85/2006", "bankruptcy", "insolvency", "reorganization" "prosecution", "partial division", "open procedure open for Law no. 64/1995 republished", "closing procedure cf. Article 117 of Law no. 64/1995", "insolvent", "covered law no. 359/2004 ", " criminal conviction ", " total spin ", " mother company insolvency ", " mother company in dissolution ", " registration rejected ". The data are of the latest information available. Thus, for 2008 resulted in 771,829 active companies in Romania. Each company I identified based on unique TAX CODE.

Then, to check conditions for SME companies, I had to check the number of employees and turnover. For this, I used public information of the Ministry of Finance. Thus, for each previously selected TAX CODE we could find the average number of employees and turnover officially declared in the annual balance sheet. This information I have accumulated for the period 2008-2011, the entire period for which statements were made.

I repeated the steps for all the years: 2008, 2009, 2010, 2011, 2012, 2013.

At this point, I joined all the information into a database unique identifier based on Tax Code, whose head table is:

Table 1. Head table of database

Tax Code	Nr of Employees	Turnover (EUR)	Status 2008	Status 2009	Status 2010	Status 2011	Status 2012	County	Region NTSU2
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Source: Own processing of the information from The National Office of Trade Register

I have added information on function indicator for each year at the Tax Code level and I have established how many of the companies with the status "running" in 2008 kept the same status in the years ahead, the resulting information like:

Table 2. Head table of database and example of data

Tax Code	Nr of employees	Turn-over (EUR)	Status 2008	Status 2009	Status 2010	Status 2011	Status 2012	County	Region NTSU2
612	1	1520	function	function	function	function	function	Bucuresti	Bucharest -Ilfov
1715	1	612	function	function	closed	closed	closed	Bucuresti	Bucharest -Ilfov

Source: Own processing of the information from The National Office of Trade Register

And concatenated, only those who had considered active status "function" and the rest statuses described above as "closed", the result created the results tables.

In addition to this database and various other information I got from the same sources (number of employees, turnover, industry, county headquarters, operating status) in order to determine size of companies, region of origin, industry in which it operates.

Then I used the method "n year survival rate" to determine how many companies remain active in successive years.

Analysis we repeated it for each year: 2008, 2009, 2010, 2011, 2012. Finally we checked whether these outcomes are consistent with the results of the Scoreboard.

3. Results of innovation in Romania during the crisis

In 2008, at the trade registry was registered 771,829 active companies. Out of these, remained active at this time 449,335 (58.2%). Most were closed by radiation(145271- 19%), temporary out of service (101816 - 13%) and dissolution (29368 - 4%).

We can see that there are big differences of the percent of survival between the regions of Romania:

Table 3. Split of active companies by regions, 2018-2013

Region	Active Companies 2008	Active Companies 2013	Percent survival
BUCHAREST-ILFOV	188444	120893	64.2%
CENTER	91261	51705	56.7%
NORD-EAST	85663	46172	53.9%
NORD-WEST	107932	60387	55.9%
SOUTH MUNTENIA	81559	49170	60.3%
SOUTH-EAST	87695	48066	54.8%
SOUTH-WEST OLTENIA	55630	30544	54.9%
WEST	73645	42398	57.6%
Grand Total	771829	449335	58.2%

Source: Own processing of the information from The National Office of Trade Register

There are regions over the average (Bucharest-Ilfov with a high concentration of population and a big university center and South Muntenia with big companies and investments) and regions with the lowest number of survival companies (Nors-East, South-East and South-West Oltenia, regions with lack of big investments and low industrialized). Small business is stimulated by dynamic industries, highly competitive medium.

Almost all the companies are SME's with less than 250 employees (447921 companies – 99,7 %). The analyses of the number of employees shows that companies with many employees have a bigger chance of survival than the companies with a small number of employees or with no employees.

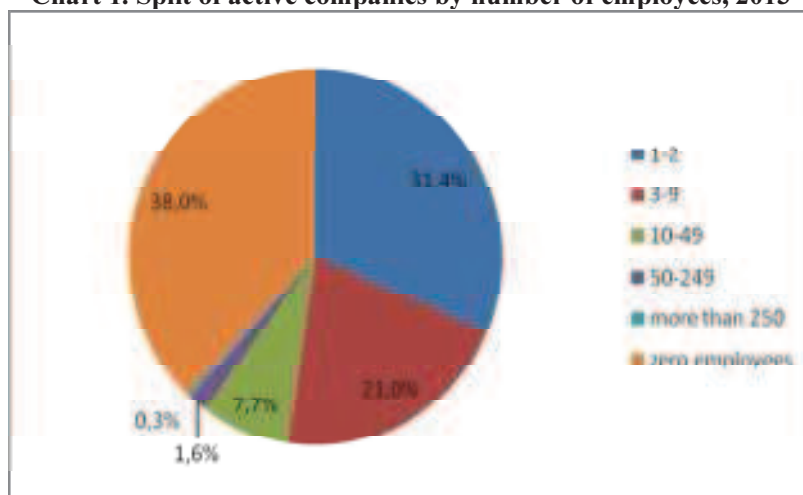
Table 4. Split of active companies by number of employees, 2018-2013

Number of employees	Active Companies 2008	Active Companies 2013	Percent survival
1-2	215461	141148	65.5%
3-9	127827	94187	73.7%
10-49	46596	34818	74.7%
50-249	9513	6972	73.3%
more than 250	1840	1414	76.8%
zero employees	370592	170796	46.1%
Grand Total	771829	449335	58.2%

Source: Own processing of the information from The National Office of Trade Register

From the survival companies, most of the companies are small (1-9 employees) or medium companies (10-49 companies). These companies have many advantages from the government and the European Union who help them with grants and European funds.

Chart 1. Split of active companies by number of employees, 2013



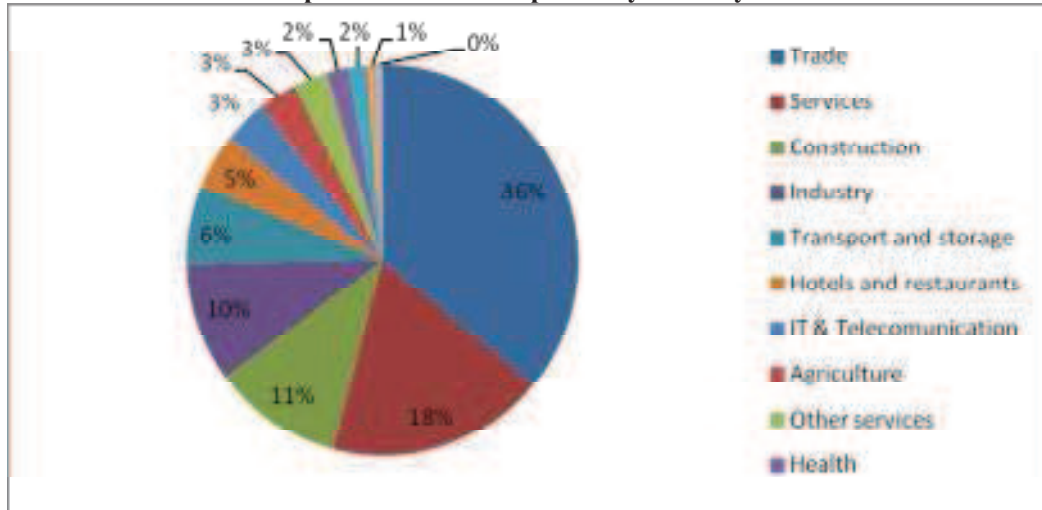
Source: Own processing of the information from The National Office of Trade Register

The activity of the survival companies is very important for their survival. An activity that is improving continuously helps the company to have constant clients and a positive revenue. In analysis, I observed that most of the companies survived from the Trade industry (34.5%), an industry that covers commerce and all the trades. Next important industry for the survival of the companies are Services (17.4%) an industry in progress in Romania, Construction (10.3%) and Industry (9.5%)

According to the National Institute of Statistics, in the report "Innovation in industry and services during 2008- 2010", in the analyzed period, the service sector was more innovative than the industry, the share of innovative enterprises that have their main activity in the services was 31.7%, while the share of innovative enterprises with main activity in industry was 30.1%, 1.6 percentage points less.

Compared with 2006-2008, the services sector has remained about the same share of 31.3% in 2006-2008 and 31.7% in 2008-2010, while in 2008-2010 the industry was a decrease of 4.6 percentage points compared with 2006-2008.

Chart 2. Split of survival companies by industry 2008-2013



Source: Own processing of the information from The National Office of Trade Register

Manufacture of basic pharmaceutical products and pharmaceutical preparations was the most innovative sector of the industry 60.6%, and the activities of insurance, reinsurance and pension funding (except compulsory social security system) was the activity the most innovative in the services 60.0%.

In the same report states that in 2010, more than half of the turnover of enterprises or 58.5% was achieved by innovative companies. The turnover of enterprises with new or significantly improved products was 14.3%. The share of new products for business enterprises was 9.8% and that of firms with new products to market was 4.5%. The innovative companies operating half of employees in enterprises 50.2% respectively. Thus, one can see a direct link between innovation and economic performance. Industries in which innovation was the majority survived the crisis better than other industries. Also, it also mentions that non-technological innovators are those companies that in 2008-2010, introduced and implemented new methods of organization, such as new business practices, new ways of organizing responsibilities at work new methods of organizing external relations or that have introduced new methods of marketing such as significant changes in the aesthetic appearance or packaging of a good or service, a new way of advertising and product promotion techniques, new methods of product placement or methods new pricing goods and services. Non-technological innovators can be simultaneously and technological innovators, ie products or processes can introduce new or significantly improved.

According to a study by the National Institute for Statistics, results of research on innovation in the period 2008-2010 showed that of all enterprises, 26.5% were non-technological innovators, regardless of their product or process innovations.

Share of enterprises with innovation marketing was 19.2% exceeding 0.8 percentage points that of firms have introduced new ways of organizing the business of 18.4%. The share of non-technological innovators is higher in services 28.4%, compared with the industry, where the share is 25.0%.

According with European Commission, Directorate General for Research and Innovation, in the report "Research and Innovation performance in Romania - Country Profile 2013" the economic impact of the innovation index is lower than the EU average, but higher than the reference group of countries with similar economic profile and research. Even if this value must be considered in its evolution in time and limited to a single year, it highlights a real economic concern for transforming knowledge and technology in economic competitiveness. Facilitate the creation of innovative businesses

with high development represents a major strategy, which requires the following three structural changes: 1) development of an excellent research focused on those sectors where Romania has a good performance compared with international benchmarks and there are potential to attract investment in economic activities; 2) stimulating entrepreneurship in order to disseminate and encourage research and innovation in the economy; and 3) the development of appropriate framework conditions for innovation, based on a comprehensive strategy, supported by stakeholders.

The factors most problematic in terms of business activity have been identified as tax rates, inefficient state bureaucracy, policy instability, access to finance and corruption.

4. Conclusions

Limited performance of Romania innovation is reflected in its economic structure, the application of knowledge is weak and culture of innovation is underdeveloped.

The analysis shows a strong link between innovation (both technological and process) on the one hand and economic growth in certain sectors and / or in certain regions, on the other hand, by comparing of result National Institute of Statistics and the data processing companies in the Trade Register and the Ministry of Finance. However, the paper does not present arguments sufficient to demonstrate that innovation is the decisive reason for the economic result.

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