

SURVIVAL RATES OF COMPANIES: THE CASE OF POLAND

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Abstract: This article discusses selected aspects related to survival of enterprises. It specifies the "survival" percentage of entities established in 2006 and monitored in the years 2007-2011 by the Central Statistical Office. It has been stated that survival depends on both internal and external factors, independent of the enterprise. According to research, approximately 30% of the strongest enterprises remained on the market after five years of conducting economic activity. The first of year of economic activity was the most difficult to survive. Enterprises operating in the health care sector (50.1%) were characterized by the highest survival rate after five years of operation, while enterprises operating in the hotel and catering sector (23.1%) by the lowest.

Keywords: survival rates, newly-established enterprises

Introduction

During economic slowdown, the number of enterprises bankruptcy increases. In the economic literature in the current deriving from enterprises organization, it is assumed that the main determinants of survival and development of a company on the market are size and age. The initial period of market operations is particularly difficult for the majority of enterprises. Although the crisis scenario, stages and symptoms themselves are similar for numerous bankrupt enterprises, the process takes place in a different manner in young enterprises and in mature undertakings which have been operating on the market for many years. This problem was noticed by Argenti (Prusak 2010, p. 61). He distinguished three trajectories of bankruptcy: enterprises which have just started business activity, young undertakings and mature companies.

Within a biological theory, bankruptcy is treated as an indispensable part of a functioning system, a natural "evening" of the enterprise's life. However, the transfer of assets and employees taking place as a result of bankruptcy generates costs, which has impact on the pace of economic development. One may distinguish direct and indirect costs of enterprise bankruptcy, with externalities being particularly high. The number of liquidated places of employment in industry in the years 2000-2012 has been presented in Figure 1. The greatest number of places of employment was liquidated in the following sectors: clothing and fur products, machines and devices, food and beverages, whereas the smallest number was in the coke and tobacco industry (Fig. 1).

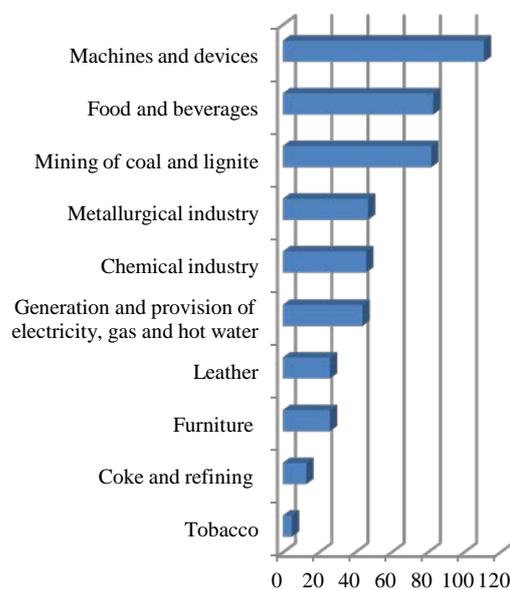
According to the research conducted so far, young enterprises are the most exposed to bankruptcy risk (Mączyńska 2005, p. 13). Research carried out by Professor E. Mączyńska shows that over a half of newly-established enterprises go bankrupt within 4 years, the following 30% within 10 years. The remaining enterprises do operate, however, they frequently utilize their resources in an ineffective manner. High bankruptcy ratio of newly-established companies may decrease entrepreneurs' motivation to set up new entities. For this reason, the analysed research problem deserves a broader examination.

1. Objective and methodology of research

While ineffective entities are liquidated due to increased competition on the market, new entities are set up in their place, which may result in bringing desired results. For this reason, it is possible to perform an analysis of how new economic entities are established ("birth rate") and interpret the enterprises' survival rate ("survival rate"), i.e. the percentage of newly-

established economic entities active after a certain period, for example after a year.

Fig.1. Number of liquidated places of employment in industry in the years 2000-2012 [in thousands]



Source: Przemysł się kończy. Przyszłość pracy jest w usługach. 5.11.2012
http://forsal.pl/grafika/659108,115034,przemysl_sie_konczy_przyszlosc_pracy_jest_w_uslugach.html retrieved 15.11.2012

The objective of the study was to identify the "survival" percentage of economic enterprises established in the year 2006 and monitored in the years 2007-2011. Attention was also paid to methodological aspects related to the examination of the discussed phenomenon. In this scope, the author applied both data and methodology of the Central Statistical Office.

Panel surveys relating to enterprises beginning economic activity were conducted in the Central Statistical Office. The panel character of surveys entailed that monitoring in subsequent years covered the undertakings from the sample selected in the first year of survey (no new undertakings in place of those which closed down were drawn, thereby the size of the sample decreased each year). Data was collected during a five-year monitoring of the same undertakings set up in a given year. The survey provided data related to effects of new enterprises' operations depending on the type and scale of undertaken business activity and external conditions.

As a result, one may attempt to analyse, among others, the probability of new companies remaining on the market in the first years after incorporation, the factors facilitating conducting economic activity for Polish entrepreneurs as well as the barriers which hinder their operations and the ways of dealing with them. The ability to react quickly to changing environment and the ability to maintain competitiveness among newly-established enterprises is the condition for survival and remaining on the market. Undertakings which are not able to meet requirements become ineffective and are driven out of the market. This phenomenon is defined as "creative destruction".

In the first year, the monitoring covered enterprises registered as new ones in the year preceding the survey. Between the second and the fifth year, the survey covered those enterprises from the initial group which conducted economic activity, i.e. remained active, at the time of monitoring. In the year 2011, five surveys of enterprises established in subsequent years 2006-2010 were

conducted concurrently. For the group established in 2006 it was the fifth and last survey, while for the population established in 2007 – the fourth, for the one established in 2008 – the third, for the one established in 2009 – the second, whereas for the population established in 2010 – the first one.

Surveys were made using the representative sampling method. The first sample for each cycle of surveys of undertakings registered in subsequent years 2004-2009 comprised 3 thousand entities. In the survey of enterprises established in 2010, started in 2011, the drawn sample constituted 1.1% of the whole examined group. The sample selection was based on the proportional sampling without replacement scheme with constant fraction and stratification. Given the stratification method, results of survey were presented in basic sections according to legal forms, enterprises' sizes and the type of conducted business activity. The scheme of panel surveys has been presented below, with monitoring conducted in the year 2011 marked (table 1).

Table 1. Panel survey scheme

Year of the survey	Year of an enterprise establishment				
	2006	2007	2008	2009	2010
2007	■	■			
2008	■	■	■		
2009	■	■	■	■	
2010	■	■	■	■	■
2011	■	■	■	■	■

Active undertakings subject to survey

Inactive undertakings not subject to the study

Source: Own study based on: A. Piatek (team leader), T. Grabowski, J. Kotowski, K. Recko: Warunki powstania i działania oraz perspektywy rozwojowe polskich przedsiębiorstw powstałych w latach 2006–2010. Główny Urząd Statystyczny, Departament Przedsiębiorstw, Informacje i Opracowania Statystyczne, Warszawa, 2012. 1-106 p. ISSN 1507 – 126X.

2. Survival of enterprises – theoretical aspects

The phenomenon of enterprises survival may, among others, be analysed using the so-called survival analysis. The analysis assumes that all enterprises create one population, whereas enterprises threatened with bankruptcy are merely "ill" subjects in this population. The survival period, estimated based on financial ratios describing the given subject, is defined for each subject from the population. The survival (or duration) of an enterprise is studied by means of a probability that a company with certain characteristics X closes business in the year t under the condition that it "has survived" until the year t . This probability for small increases of the t period may be assumed as the value of a so-called hazard function.

A variable which is important in the survival analysis is the time which passes between the "entry" and the "exit", i.e. the duration period from the moment of establishment until the end of the company's operations. One may monitor the entire period or its shorter part – as the effect of left- or right-side censoring. The duration is a non-negative random variable T which is usually a discrete variable in economy. The deduction process in the survival analysis theory is usually conducted for a continuous variable. The T distribution function of the variable is marked as $F(t)$, while the density function of that variable as $f(t) = dF(t)/dt$. The probability that duration is not longer than t is expressed by the formula $Pr(T \leq t) = F(t)$. On the other hand, probability that duration is longer than t is expressed by a survival function: $S(t) = Pr(T > t) = 1 - F(t)$. The survival function decreases monotonically from digits to zero. The hazard function has the following form:

$$\gamma(t) = \lim_{\Delta t \rightarrow 0} \frac{\Pr(t \leq T < t + \Delta t | T \geq t)}{\Delta t} = \frac{f(t)}{S(t)}$$

The value of the hazard function is (temporary, for small Δt) the probability of exit from a given state on condition of survival until t time. One may distinguish a single hazard model and a competitive risks model. The application of the above models (Gruszczyński, p. 160) was not presented in this study. Enterprises survival models are an element of business demography, which name has, according to Gruszczyński (2012, p. 159), aroused controversy between statisticians and demographers. Opponents of the term "business demography", e.g. Domański and Szreder (2010), indicate that the term "demography" should be attributed exclusively to studies on the population of people. Supporters emphasize the fact that the tools used in demography may also be useful in other fields (Paradysz 2011) (quotation from Gruszczyński 2012, p. 159).

3. Results of the survey¹

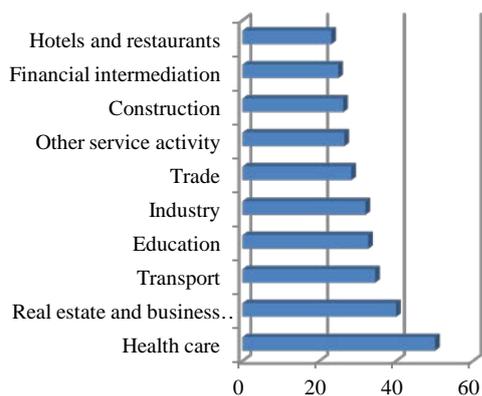
From among 241.4 thousand entities established in 2006, 75.5 thousand entities remained on the market after five years, which constituted 31.3% of the examined group. Definitely, enterprises which hired workers were more stable than enterprises without hired workers (survival rates 55.4% and 24.8% respectively) and legal persons than natural persons (survival rates 58.0% and 29.7% respectively). For comparison, the survival rate for examined entities after 4 years of business activity (i.e. in 2010) was 36.2%. The first year of business activity was the most difficult for enterprises established in 2006. 66.5% of undertakings remained on the market until 2007. The survival rates of enterprises established in 2006 were higher in the following four years, while the ratio decreased in the fifth year of operating i.e. in the year 2011.

Entities operating in the health care sector were characterized by the highest survival ratio (50.1%). The rate for sectors such as real estate, services for business, transport, education and industry was higher than average. The rate for other sectors was lower than average, with enterprises operating in accommodation and catering services being the weakest – only 23.1% of entities remained on the market after five years (Fig. 2).

Survival rates for enterprises established by men and women were similar. 46.1% of companies established by men and 43.8% of companies established by women remained on the market. A considerably greater diversification of survival rate was observed in particular groups distinguished based on the owner's personal characteristics. Entities of the youngest entrepreneurs (up to 29 years old) were the least stable, whereas companies established by people aged between 40-49 were more stable. Over five subsequent years, a half of companies established by persons with higher education and one third of companies established by persons with primary education survived on the market.

Fig. 2. Enterprises established in 2006 according to the principal activity – survival rate until 2011 [in percentage]

¹ This part of the paper was drawn based on data and results of survey contained in the publication: A. Piatek (team leader), T. Grabowski, J. Kotowski, K. Recko: Warunki powstania i działania oraz perspektywy rozwojowe polskich przedsiębiorstw powstałych w latach 2006–2010. Główny Urząd Statystyczny, Departament Przedsiębiorstw, Informacje i Opracowania Statystyczne, Warszawa, 2012. 1-106 p. ISSN 1507 – 126X.



Source: Own study based on: A. Płatek (team leader), T. Grabowski, J. Kotowski, K. Rećko: *Warunki powstania i działania oraz perspektywy rozwojowe polskich przedsiębiorstw powstałych w latach 2006–2010*. Główny Urząd Statystyczny, Departament Przedsiębiorstw, Informacje i Opracowania Statystyczne, Warszawa, 2012. 1-106 p. ISSN 1507 – 126X.

56.5% of companies which undertook investment activities in the first year of operation remained active until 2011. Whereas 42.0% of companies which did not incur investment expenditures remained on the market. 27.5% of active entities registered in 2006 undertook investment activities in the year 2011. 50.7% of entities which did not report difficulties in conducting and developing business activity in the first year of operating remained active until 2011.

In the year 2011, both enterprises generating profit and those incurring loss noted a drop in survival rates in relation to previous years. In the case of enterprises generating profit, survival rates in 2010 were higher than in 2011, at the same time, for enterprises which generated negative financial results, the year 2011 was worse than 2010 and 2009. In the majority of sections, entities generating profit were characterized by higher survival rate than in the case of enterprises incurring loss.

84.9% of all enterprises generated profit in 2011. 48.8% of entities which noted profit and 39.2% of those which incurred loss in 2007 remained on the market. Almost 90% of natural persons and 60% of legal persons established in 2006 generated profit in 2011.

Excessive competition and related decreasing of prices by competitors were indicated as a barrier in developing business by the greatest number of enterprises established in 2006 and still active in 2011. Insufficient funds were the main problem for the majority of companies.

Summary and conclusions

Establishment of new enterprises, their survival on the market and development are processes depending on numerous factors. Those include both internal conditions related to potential entrepreneurs' predispositions and external ones. Such conditions determine whether they achieve success or fail. Survival depends on the market conditions in which enterprises are set up, the funds which they have at their disposal, the profile of business activity which they intend to conduct, access to external financial resources, the scope of business activity, the ability to deal with individual barriers and the ability to generate profit. 30% of the strongest entities remained on the market after five years of business activity. The first year of activity was the most difficult to survive for enterprises. Experience obtained by entrepreneurs helps them to survive.

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