International Journal of Business and Social Research
Volume 05, Issue 11, 2015

Duration Analysis of Firms – Cohort Tables and Hazard Function

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ABSTRACT

The aim of this study is to identify the survival process of a cohort of firms. I propose my original systematic approach to the methods for analysing the firms' vitality (statistical and econometric study on the cohorts of firms). I obtained the research data from 59587 economic entities established in the Zachodniopomorskie voivodeship (Poland) in 2009-2011. As a result I found out that the intensity function of firms' liquidation take a typical inverted U-shape.

Keywords: Duration tables, firms, hazard (intensity), modelling duration.
JEL Codes: C01, C13, C14, C41, L25.
Available Online: 01-12-2015.

1.0 INTRODUCTION

The establishment of new businesses, especially the small and medium ones, boosts competition and entrepreneurship. The cohorts of firms attract the attention of economists, including those dealing with the labour market. Their research is often focused on these firms' contribution to modern economies, their growing share in national production and on the fact that they are absorbing increasingly more production factors. They also play a specific role in creating more flexible economies and in the reduction of unemployment.

In Poland the increase in the number of firms started in 1988, when the Business Activity Act was adopted followed by the transformation of the Polish economic system from the socialist to market economy. Flourishing entrepreneurship brought changes in the structure of business environment in terms of company ownership, size (number of staff) and lifetime.

The terms of entrepreneurship, an entrepreneur and an enterprise are closely interrelated, both in economics and in economic practice. Entrepreneurship means the capability to adapt to the existing circumstances, to solve problems and to pursue the company development or its survival on the

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market. As it is often emphasised in the literature, entrepreneurship is an attribute of both the entrepreneur and their enterprise (Schumacher, 1981; Schumpeter, 1960; Drucker, 1992).

According to the European Commission, entrepreneurial policy must stimulate the creation of all forms of enterprise. The European Economic and Social Committee (EESC) believes that society should not look upon entrepreneurship as a cure-all, but rather as an aid to the behaviour change required to develop a culture of innovation, to the search for knowledge and business opportunities, with a view to achieving sustainable economic growth and social wellbeing in all forms of enterprise. Entrepreneurship in itself is a concept that has already been identified and acknowledged as a factor that sets developed societies apart and that should be a positive feature of an organised society. The EESC would again make it clear that while it is indeed essential to promote the creation of new enterprises or to facilitate the transfer of those under threat of closure or bankruptcy, it is just as essential to support existing businesses. Between start-up and closure there is the entire life-cycle of an enterprise, requiring specific policies combining better regulation in order to generate sustainable jobs and economic activity, innovation and competitiveness within the single market and as part of the globalised economy (European Commission, 2013).

According to Eurobarometer 2012 (European Commission, 2012), 37% of EU respondents prefer self-employment. In Poland this percentage is higher and stands at 47% (Poland is ranked 19th in the total of 27 EU members). The figures concerning respondents' answers to the question "regardless of whether or not you would like to become self-employed, would it be feasible for you to be self-employed within the next 5 years?" were even higher. The positive answers amounted to 30% in the EU and to 49% in Poland (ranking it the third in the EU27). It should be recalled that the European Commission included the promotion of entrepreneurship in the Europe 2020 strategy which regards entrepreneurship and self-employment as one of the vital elements of intelligent, sustainable and social inclusion-friendly development.

As stated in the European Commission report (European Commission, 2014) in 2013 SMEs in the nonfinancial sector of six largest EU member states constituted 65% of the total of the European SMEs. Those six largest EU members were: Italy (17.2%), France (12.0%), Spain (10.4%), Germany (10.2%), United Kingdom (8.0%) and Poland (6.8%). They were also the leaders in employment rates with the total employment share of 68% (Germany – 18.8%, Italy – 13.0%, France – 10.8%, United Kingdom – 10.8%, Spain – 8.6% and Poland – 6.4%).

This paper is of both theoretical and empirical character. The aim of this study is to identify the survival process of a cohort of firms. I propose my original systematic approach to the methods for analysing the firms' vitality (statistical and econometric study on the cohorts of firms). I obtained the research data from 59587 economic entities established in the Zachodniopomorskie voivodeship (Poland) in 2009-2011. As a result I found out that the intensity function of firms' liquidation take a typical inverted U-shape.

Just like human cohorts, the cohorts of firms are usually examined by means of the survival analysis methods. The present paper proposes the use of survival tables and the intensity (hazard) function of firms' liquidation. The application of survival analysis methods rather than traditional methods in the analysis of firms' duration opens up opportunities for a better use of the research results in supporting enterprises by public policy.

The firm liquidation intensity function taking the inverted U shape indicates the most critical moment in business operation. My study results reveal the most difficult period in the firm's lifetime, which can be an important indicator for the creators of entrepreneurship support policies.

2.0 LITERATURE REVIEW - BACKGROUND

The number of enterprises cannot grow infinitely. A part of them will fail after being successful for some time. In the world literature it is more and more often pointed out that the process of setting up

new businesses and closing down the inefficient ones is a key to a successful economy (Scarpetta, Bassanini, Pilat & Schreyer, 2000; López-Garcia & Puente, 2006). The research shows that the changes in the population of businesses (their birth and death rates, expansion and contraction of a business area) can be responsible for 20-30% of the labour productivity growth (Foster, Haltiwanger & Krizan, 2001). This growth results from increased competition, innovation and effectiveness of firms encouraged by the emergence of new businesses and the failure of the existing ones.

Although a constant strive for a competitive advantage over other companies is basically coerced by new establishments, there are also other factors that influence the process. The most recent studies on firms focus on the effect of the EU single currency on the restructuring of business entities. Globalised markets force them into adapting to the changing conditions, so that they can continue to grow and survive. For example, in their Italian study Bugamelli, Schivardi & Zizza (2009) proved that those businesses that want to maintain or reclaim their price competitiveness tend to reinforce such their activities as product design, advertising or marketing and distribution at the expense of their manufacturing activity.

In their study on the OECD countries Bartelsmann, Scarpetta & Schivardi (2005) find out that out of all businesses set up on a given market approximately 20% would be liquidated within a year. Start-ups are usually small, so initially they create relatively few jobs. Neumark, Wall & Zhang (2008), the authors of *Do Small Businesses Create More Jobs? New Evidence from the National Establishment Time,* basing on information coming from a new database, contributed to a long-going discussion on the role of small enterprises in creating jobs. Birch (1981; 1987) found out that small enterprises were a vital source of new jobs in the US economy. Yet, Davis, Haltiwanger & Schuh (1996) claim that he was wrong as there is no correlation between the size of firms and the number of new jobs they provide. The analysis of data coming from the new NETS database allows for several conclusions concerning both the economy in general and its individual sectors. The research findings show that small enterprises do create more jobs, but their advantage is not as impressive as it was suggested by Birch. Many authors indicate that the negative relationship between the firm size and the number of new jobs (smaller businesses hire more people) is not observed in the manufacturing sector. Moreover, it is often emphasised that in small firms the number of created jobs is more difficult to assess than in the medium and big ones because, for instance, when small businesses increase the number of its staff, some of them are automatically transferred to the sector of larger enterprises. Davis, Haltiwanger & Schuh (1996) invoke Gibrat's law according to which the rate of company growth is independent from its size. They argue that research should focus on better understanding corporate behaviour rather than finding out if small enterprises create the majority of new jobs.

The popular term of *business demography* or *demography of the firm* denotes a relatively young area of science which focuses on the structures of cohorts of firms and the changes that undergo within these structures. As both the terms suggest, the studies use research methods traditionally applied in demographic studies.

Santarelli (2000) applied the Cox regression model in order to analyse the start-ups' survival rate. His aim was to find the relationship between the duration of firms and the size of newly born enterprises from the Italian financial intermediation sector. The study included two cohorts. The first one consisted of 110 firms established in 1989, while the second one – 72 firms born in 1990. By the end of the observation, i.e. by late December 1994 and 1995, respectively, less than a half of the firms had survived (45.45% and 44.44%, respectively). The author presented the empirical survival rates and the hazard functions determined by means of the Kaplan-Meier estimator, but he referred them to calendar years, which considerably hinders their interpretation. The application of the Cox model enabled Santarelli to draw a conclusion that at the moment of birth the size of an Italian financial intermediation company (the number of its employees) has a positive effect on its survival odds (companies employing more staff tend to live longer).

The duration of Spanish firms' lifetimes was the subject of studies by López-Garcia & Puente (2006). As duration determinants they chose the firm's size (the number of staff) at the time of its launch, the

value of a short-term debt (up to 12 months) and a long-term debt (longer than 12 months) as well as the firm's initial equity and the failure rates in a given section in the year of the firm's birth. The researches could include the financial attributes in their study thanks to the access to database coming from bank registers. The authors attached special importance to the initial size of an enterprise, but they also observed that some papers on *business demography* presented the view that the size of a newly started firm was equally relevant. Their analyses indicated insignificant differences in the percentage of businesses that survived for 2, 4 and 6 years depending on their size (1–19, 20–99 and 100 and more employees).

Nunes & de Morais Sarmento (2009) determined the survival function for staff employing enterprises established in Portugal between 1987 and 2005. According to their survey, 86% of those companies lived longer than one year, but only 22% survived for 18 years. It took six years of successful business operation for the risk of failure to abate. The enterprises were classified into six size groups: 1–4, 5–9, 10–19, 20–49, 50–249 and 250+ employees. The research showed that the larger the firm at the start, the better its survival odds. Bhattacharjee (2005) studied the death of listed companies in the United Kingdom in 1965–2002. He proposed to include in the hazard model the initial and current size of a company. He showed that the effect of the initial business size on its lifetime changed as the firm matured. Kaniovski & Peneder (2008) used the parametric survival analysis in their 1975-2004 studies on Austrian firms with at least one employee. They claim that the risk of failure affects more often firms in the services sector than in the manufacturing one and that bigger firms are more likely to survive than the smaller ones.

Many studies show that the enterprises' age, size, growth and mortality are interrelated (Freeman, Carroll, & Hannan, 1983; Hannan & Freeman, 1989; Carroll & Hannan, 2000; Caves, 1998). According to Marques (2014) the firm size variables (up to 3 employees and 4-10 employees) are associated with the indicator of "social learning network" belonging to the knowledge space, meaning that micro-enterprises in incubation fewer employees benefit greatly from the social network that promotes the exchange of knowledge and skills transfer, develops relationships and accelerates learning. The programs implemented in the Coimbra region and intended to promote entrepreneurship, involving the University, local government and other regional organizations, have had a strong impact on the generation of start-ups that have less than 10 employees (a database of 18 start-ups based in the University of Coimbra incubator was used).

Geroski, Mata & Portugal (2007) investigated the survival rates of Portuguese start-ups. They used data collected by the Portuguese Ministry of Labour between 1982 and 1995. They created a database which included all the newly established employers. The database was of longitudinal character as the assigned numbers made it possible to identify a given company in time. The study covered 118 114 set ups over the period of 1983–1993. Obviously, throughout that period of time the observations of the cohorts of firms were getting shorter – the businesses established in 1983 were observed the longest. After one year of observation the survival rate was 75%, after 5 years – 44% and after 10 years – 30%. What is more, the study was based on the panel observation of a 12-month cycle, so the duration was recorded with one-year accuracy. The estimated semi-parametric models showed that the start-ups that were larger in the first year of operation survived longer. The stronger the competition at the firm's birth, the less likelihood of its survival. Moreover, a large number of newly established enterprises on the market had a similar effect on the survival odds. Noteworthy is the authors' finding that the conditions at the firm's birth are more important for its survival that the current conditions of their operation.

Using parametric survival analysis, Tsvetkova, Thill & Strumsky (2014) tested the effects of regional innovation on exit likelihood in the US computer and electronic product manufacturing during the 1992–2008 period. The reason why *business demography* focuses on the number of enterprise births and deaths as well as on their survival, is the potential role of start-ups in economic growth, job creation and improved efficiency (Schrör, 2008).

The work *Business Demography in Spain: Determinants of Firm Survival* presents the results of a research project conducted in Spain. In its authors' opinion, when observing the influence of start-ups on the market we should include in the analysis not only the number of firms in the register, but also their size and duration of the market. A new database has been established: *Bank of Spain Firm Demography Database*, encompassing all the economic sectors. The purpose of the project was to find all the factors of firm survival (López-Garcia & Puente, 2006). Big set-ups can live longer, while the risk of failure is higher in the sectors where concentration is low. Thanks to their access to bank data the authors could include the initial financial structure of enterprises to the survival factors. The research findings imply that holding debt has a positive effect on the firm survival up to some point beyond which further debt increment has a negative impact. The enterprise death rates in Spain were lower than in peer countries and the failure risk function took a form of an inverted letter *U* with an approximately four-year maximum.

The shape of the smoothed hazard function was the result of many studies (Markowicz, 2013): Italian manufacturing firms with its maximum of two years at the point of establishment (Audretsch, Santarelli & Vivarelli, 1999), listed companies in UK with its maximum at the point of three years post-listing (Bhattacharjee, 2005), small German manufacturing firms with its maximum around three years after entry (Wagner, 1994), find also a clear inverted–U shaped hazard function for the UK, Italy and the US (Bartelsman, Scarpetta & Schivardi, 2005), young, small firms in the US with its maximum at the point of 27 months (Praag van, 2003), Spanish firms (born between 1995 and 2002 across all sectors in the business economy) with its maximum around the fourth year at the point of establishment (López-Garcia & Puente, 2006), Portuguese firms; the hazard function exhibits an inverted–U shape, with a maximum around the sixth year of activity (Nunes & de Morais Sarmento 2009).

The hazard function shaped as an inverted *U* is in keeping with the theoretical model of learning (Ericson & Pakes, 1998; Bhattacharjee, 2005). The model assumes that the entrepreneur needs time to decide if their firm is capable of functioning on the market. In the initial stage of operation the increased costs are expected and covered from equity. If the firm makes profits after some time, it is likely to survive. If not, its failure is imminent.

The experience gained by the entrepreneur at the beginning of their presence on the market– their *liability of the adolescence* – is of vital importance (López-Garcia & Puente, 2006). In the literature one can also find theoretical models where it is assumed that the hazard function is the largest in the initial stages of business operation, followed by its decrease as the firm matures (Jovanovic, 1982).

3.0 ANALYSIS OF THE FIRMS' VITALITY – METHODS AND DATA CENSORSHIP

The analysis of firm vitality is a mix of statistic methods of the ratio analysis and the survival analysis applied in the comprehensive research of the status, structure, dynamics, intensity and modelling of the firm lifetime of the population of firms (Markowicz, 2012). The methods of the firms' survival analysis include:

a) models with continuous time:
   - non-parametric models: survival tables, Kaplan-Meier estimator,
   - semi-parametric models: Cox regression model,

b) models with discrete time: logistic regression.

The survival analysis is a collection of methods for processes modelling, i.e. the survival of the phenomena under study, from the initial to final event (London 1988).

The present paper presents the findings of studies into duration of firm. I look at the model of just one state that is the running of an economic entity. The initial event is the act of setting up a enterprise (registering it), while the final event is its de-registration. The episode is the time between the initial and the final events, or the duration of enterprise.

In the survival analysis the random variable is the time between the events. It is a continuous variable, but it can be occasionally treated as a discrete variable if the observed time series are fixed.

In both the retrospective and the panel research the data can be censored (Bednarski, 2014). The researcher is interested in the probability of the event that ends the observation on a given subject in the subsequent time units. If the event has failed to take place by the end of the observation, we call such an observation incomplete or censored, i.e. the duration of a given episode is not known (Bieszk-Stolorz & Markowicz, 2012). The main reasons for incomplete data to occur are: our inability to continue the observation to the end, i.e. until all the subjects complete the process; and the unavailability of some subjects in a fixed period of time. The former reason takes place when the observed process exceeds the research capacity, while the latter – when the subjects have not been observed since the beginning of the process, escape the observation or are eliminated from the sample. The subject's duration can be left-, right- or bilaterally censored (no information about the beginning, the end and both the beginning and the end of the process). The most common type of censoring occurring in empirical studies is the right-censoring, and such is the case in the present study. As the right-censoring takes place only when the end of the observation is known, we can distinguish its following types (Markowicz, 2012):

- time censoring – censoring due to time (the observation ends at a predetermined time);
- failure censoring – censoring due to the number of subjects that experienced the final event (due to the number of failures);
- date censoring – censoring due to a fixed date (according to the calendar) when the observation ends (random censoring).

When using the first type, we determine the so called censoring time (t_c). All the subjects are observed over the same predetermined time. In such a case the time to the final event is no longer than t_c. The random variable adopts a fixed value of time for complete observations and a fixed censoring time value for censored observations (we do not know the exact time). The initial event for all the cohort members is positioned in the same point on the time axis t_o, despite the fact that the observations of individual subjects started at different dates.

In the second type of censoring the observation ends when the fixed number of subjects (k) survives by the final event. In this case the random variable adopts the values of time until the event happens for k when the observations are complete, or the value of time of the k-th subject when the observations are incomplete and their exact time is not known. The initial event for all the cohort members is positioned on the time axis t_o. The researcher continues the observation until the end of the episodes of the fixed number of subjects k. In the case of the subjects which have not survived until the end of the observation we know only the censoring time which is equal to the survival time of the k-th subject and is denoted t_k. These are incomplete data. In the literature this type is called failure censoring.

Random censoring takes place when individual subjects enter the observation at different calendar dates and the observation ends at a fixed date. Such censoring type is the best suited for the studies on the enterprise survival time. The period of observation is limited by dates. In my study the observation took place between 1 January 2009 and 31 December 2011. The observed firms were set up and closed down at different moments.

Data used for the purpose of a retrospective duration analysis usually include specific dates, such as the date of entry to and exit from a given cohort, provided the subject survived the final event of the observation (i.e. the dates of starting and ending the business operation). In order to perform the analysis we need to know the completed or censored duration of the phenomena. It is necessary to convert the calendar time into the cohort time, i.e. the subjects' survival time.

We consider the duration analysis (survival) to be complete if we know the complete survival time of all the subjects. However, if the process under observation is long, the researcher usually is not able to conduct the observation. This is the case when we analyse the duration of enterprises that can operate

on the market for a very long time if not infinitely. Then, we have to terminate the observation at a predetermined time or replace it by cross-cutting research.

4.0 COHORT TABLE OF FIRMS AND INTENSITY LIQUIDATION

I built the cohort table containing the intensity function of firms' liquidation for entities established in Zachodniopomorskie voivodeship in 2009-2011 which I observed until 2013. At the time 59587 businesses were established.

The cohort tables present the process of changes occurring over time in the cohort`s composition. A cohort is made of companies set up in a given year. What is recorded is the fact of the company close down as well as the time from the moment the observation was launched to the moment of a company leaving the cohort. The cohort tables belong to models with continuous time, but presented here estimates of functions are discrete, which is why I give the value of the time variable, grouped in equal intervals, as the beginning of the interval (t). The number of firms that survived (n_t) is given as recorded at the beginning of the interval and calculated as $n_t = n_{t-1} - (z_t + c_t)$, wherein n_t for $t = 0$ (n_0) denotes the initial number of firms in the cohort; z_t marks the number of firms liquidated in the interval $\langle t, t+1)$, c_t denotes the number of firms which did not experience that event by the end of the cohort observation time. That is why for firms from the 2009-2011 cohort (Table 1) the last interval of time in the table is the interval of $\langle 57, 60)$ months.

I estimate the next two values in the cohort table of survival according to the discrete approach because they can be calculated only for the time interval. The first of them means the probability of a firm to be liquidated in the time interval f_t, defined as the conditional probability of a firm to be liquidated in the interval of survival time $\langle t, t+1)$, providing that the firm has not been liquidated by the time t. The distribution of the company survival fails to be assigned to any known type of probability distribution. This is why we do not know the functions describing the process of the company survival, and the tables of survival contain their estimates calculated on the basis on empirical data. The probability estimator of firm liquidation in the time interval $\hat{f}_t$ is a ratio of the number of liquidated firms in a given interval of time z_t to the number of firms which survived by the beginning of the interval n_t. Opposite to the probability of firm liquidation in the time interval is the probability of firm survival in the time interval p_t, defined as the conditional probability for the firm to survive through the interval $\langle t, t+1)$, provided that the firm had not been liquidated by the time t. The probability estimator of a firm survival in the interval $\hat{p}_t$ is a ratio of the number of firms surviving by the beginnings of the interval $t + 1$ (n_{t+1}) to the number of firms which survived by the beginning of the interval t (n_t). The probability of outliving S_t and the hazard intensity h_t are functions continuous in their nature, but in the tables they are presented in a discrete approach. The probability of outliving S_t, when calculated for interval $\langle t, t+1)$, is the probability that the firm will be liquidated after the time $t + 1$. The ratio of the number of companies which survived by the time $t + 1$ to the initial number of companies in the cohort, is the estimator of the survival probability function $\hat{S}_t$.

In the moment $t = 0$ (in moment of setting up a firm) $S_t = 1$ and this function is decreasing over time. The rate at which the survival function is decreasing depends on the value of t and is defined as a function of hazard intensity h_t. The estimator $\hat{h}_t$ of this function is calculated as the ratio of the probability estimator of a company liquidation in the interval $\langle t, t+1)$ to the half of the sum of the estimators of the company probability to outlive beyond the intervals $\langle t, t+1)$ and $\langle t-1, t)$:

$$\hat{h}_t = \frac{\hat{f}_t}{(\hat{S}_t + \hat{S}_{t-1})/2} \qquad (1)$$

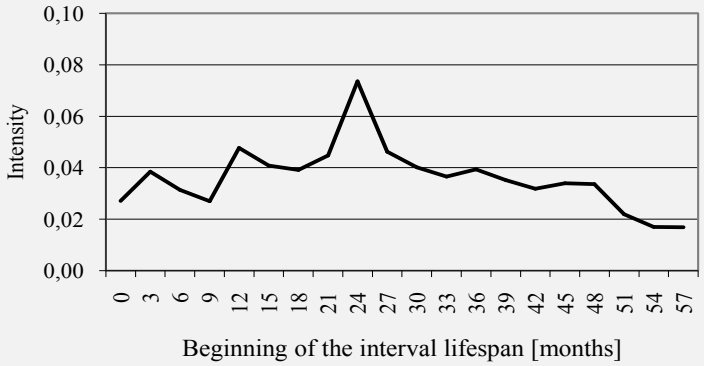
Table 1 shows the cohort table of survival for firms set up in Zachodniopomorskie voivodeship in 2009-2011. Figure 1 shows the graph of the estimated intensity firm liquidation $\hat{h}_t$.

Table 01: The cohort table of survival of firms established in Zachodniopomorskie voivodeship in 2009-2011 – observation by the end of 2013

Duration time [months]	Number of firms, which endured	Number of liquidated firms in section of time	Number of censored firms in section of time	Estimation the probability of liquidation the firm in section of time	Estimation the probability of surviving	Estimation the intensity liquidation
t	n_t	z_t	c_t	$\hat{f}_t$	$\hat{S}_t$	$\hat{h}_t$
					1.0000	
0	59587	1592	0	0.02672	0.97328	0.02708
3	57995	2128	0	0.03669	0.93757	0.03840
6	55867	1617	0	0.02894	0.91043	0.03132
9	54250	1319	0	0.02431	0.88830	0.02703
12	52931	2194	0	0.04145	0.85148	0.04765
15	50737	1733	0	0.03416	0.82239	0.04081
18	49004	1554	0	0.03171	0.79631	0.03918
21	47450	1660	0	0.03498	0.76846	0.04471
24	45790	2516	2099	0.05495	0.72623	0.07352
27	41175	1359	2564	0.03301	0.70343	0.04617
30	37252	1039	2921	0.02789	0.68599	0.04015
33	33292	825	3308	0.02478	0.67214	0.03649
36	29159	763	3446	0.02617	0.65934	0.03930
39	24950	574	3363	0.02301	0.64971	0.03515
42	21013	432	3044	0.02056	0.64246	0.03182
45	17537	381	3243	0.02173	0.63606	0.03399
48	13913	296	2914	0.02128	0.63109	0.03358
51	10703	148	3716	0.01383	0.62861	0.02195
54	6839	73	3842	0.01067	0.62739	0.01700
57	2924	31	2893	0.01060	0.62686	0.01691

Source: own study.

Fig. 01: Intensity of firms' liquidation for cohort



Source: own study.

As I have mentioned before, the hazard function for the observed cohort of firms adopts the shape of an inverted letter *U*. The maximum of this function lies within the interval of 24 to 27 months. Therefore, when the duration of firms exceeds this time, the risk of its failure decreases.

I also build the survival tables for the PKD2007 section. Figures 2-8 show the intensity of firms' liquidation in the chosen sections.

The maximum of the intensity function ranges between 24 and 27 months. Hence, after two years on the market the intensity of a firm liquidation decreases. This finding is true about all the enterprises and the majority of sections (e.g. section C – manufacturing, section F – construction, section G – trade and repair of motor vehicles). In the case of section H (transportation and storage) the intensity function takes a slightly different shape. Transportation companies reach the threshold after the 2nd and 4th year of operation, then the intensity dwindles. This is associated with substantial starting costs. Companies offering accommodation and food services (section I) reach the threshold much sooner – after 3 to 6 months, which is a consequence of closing up after the summer season. The intensity functions in sections J (information and communication) and L (real estate activities) resemble an inverted *U* the least (there is no distinct function maximum).

Fig. 02: Intensity of firms' liquidation – section C, manufacturing

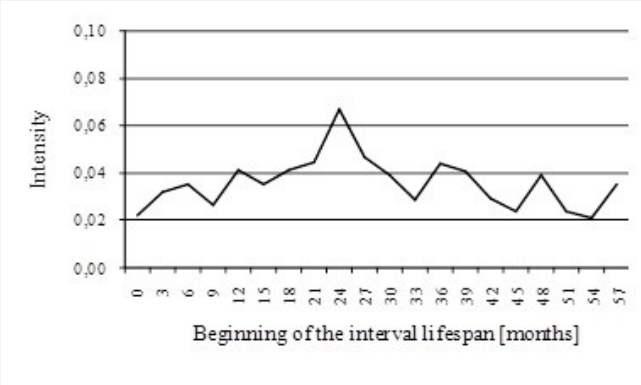


Fig. 03: Intensity of firms' liquidation – section F, construction

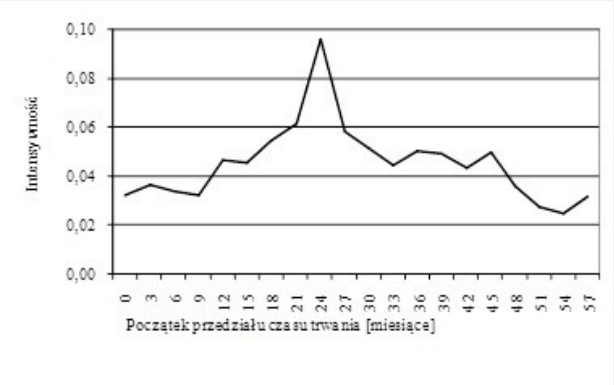


Fig. 4: Intensity of firms' liquidation – section G, trade and repair of motor vehicles

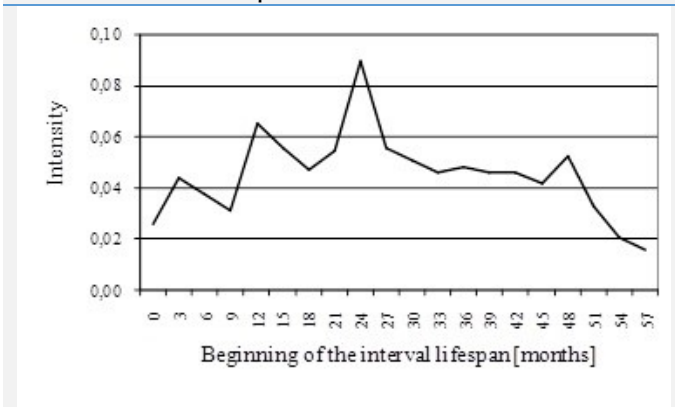


Fig. 5: Intensity of firms' liquidation – section H, transportation and storage

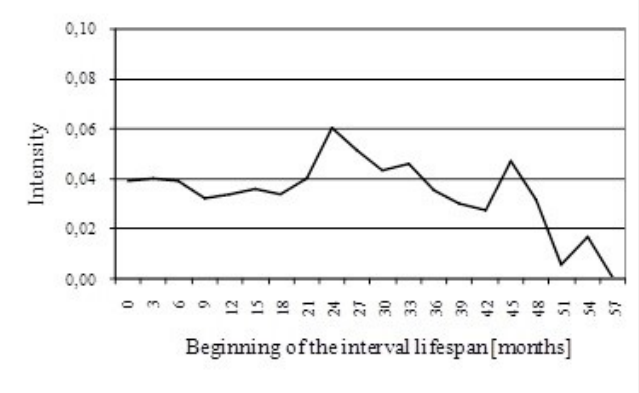


Fig. 06: Intensity of firms' liquidation – section I, accommodation and food service activities

Fig. 07: Intensity of firms' liquidation – section J, information and communication

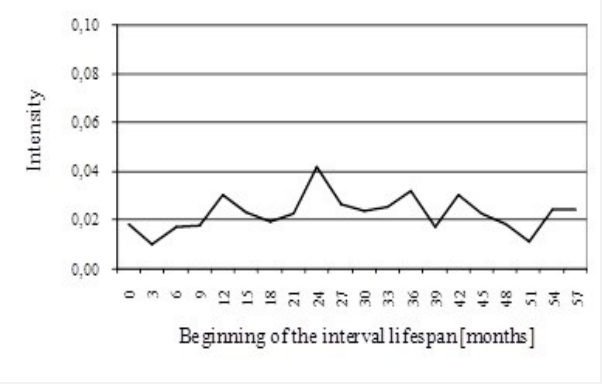
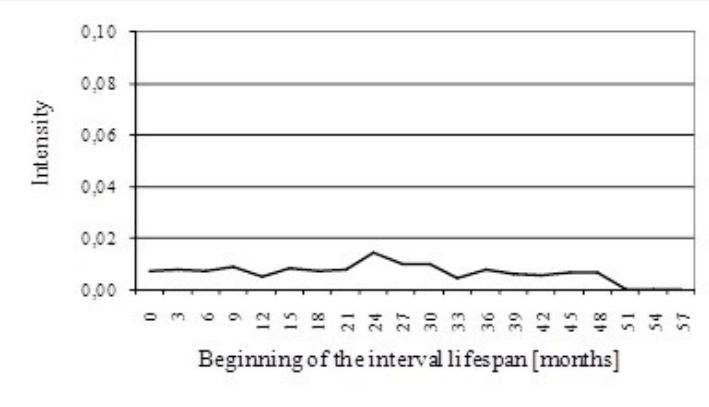


Fig. 8: Intensity of firms' liquidation – section L, real estate activities



Source: own study.

5.0 CONCLUSION

The cohorts of business, similarly to human cohorts, can be subject to analysis by means of a collection of methods generally known as the survival analysis. In this article I choose to name it a firm vitality analysis. Due to the theoretical-empirical character of this paper it contains the overview of both the reference literature as well as the methods to analyse the business vitality. As the empirical example I choose the survival table I have built for the cohort of firms set up in the Zachodniopomorskie voivodeship between 2009 and 2011. Additionally, I discuss the intensity of a firms' liquidation.

The studies into the duration of economic entities have been gaining popularity. According to scientific publications, the elementary problem faced by the researchers is limited access to reliable data.

The application of survival analysis methods rather than traditional methods in the analysis of firms' duration opens up opportunities for a better use of the research results in supporting enterprises by public policy. The firm liquidation intensity function taking the inverted U shape indicates the most critical moment in business operation. My study results reveal the most difficult period in the firm's lifetime, which can be an important indicator for the creators of entrepreneurship support policies.

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