SIZE EFFECT ON SURVIVABILITY OF SMEs BASED ON THE SURVIVAL INDEX VALUE (SIV®) MODEL

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Abstract

Effect of firm size on survivability of Small and Medium-sized Enterprises (SMEs) is of great importance. Researchers have dealt with this issue using diverse analysis methods. The tool we used for such analysis, in this work, is the Survival Index Value (SIV®) model. To our knowledge, this method has never been used before to study the issue of firm size impact on small firm survivability. We found that higher firm size do not enhance survivability of SMEs with a positive slope of their Survival Progression Indicator (SPI) line, neither it does that for firms with negative slope of the SPI line. However, no evidence was found to support the common understanding that reducing firm size would enhance survivability of firms with negative SPI line. Increasing firm size was found to have positive effect on survival of firms with a slope of the SPI line close to zero.

Keywords: Small and Medium-size Enterprise, SMEs, SIV model, SIV® model, Firm Size, Relative Size of Enterprise, Survival Progression Indicator, SPI, Survivability

1. Introduction

Failure rate among small businesses is high (Monk, 2000). A major cause for that is the lack of experience and management skills (Hampherys and McLung, 1981; Monk, 2000; Schwartz, 1976). Thus there is a need to improve management policies of SMEs executives. The purpose is to enhance the like hood of survival for these firms and to elevate their performance. This can be achieved by studying the different factors affecting the performance of small companies and to try to understand their contribution to the survivability of SMEs. That in it's turn is expected to give managers better knowledge base to act upon and take decisions. A newly introduced method to be used for that purpose is the Survival Index Value (SIV®) Model (see Abouzeedan, 2001; Abouzeedan and Busler, 2002a). The SIV® model, developed by Dr. Adli Abouzeedan, utilizes survivability as an indicator of firm performance. The model assigns a Survival Index (SI) value, at selected time-point of the firm life. Higher positive SI values indicate a healthy firm while higher negative SI values indicate a firm in danger of collapsing. At a later stage, Abouzeedan and Busler (2003a), developed further the SIV® model and introduced a new parameter within the model. The new parameter, called "*Survivability Coefficient*" is the slope value of the SPI line. Higher positive values of the coefficient indicate a good performing enterprise, while higher negative values indicate a firm in trouble. In this paper, we are studying the impact of enterprise size on survivability. Our aim is to verify the value of the SIV® model in studying the relationship between enterprise size and performance. To our knowledge, there was no such previous attempt to quantify such a relationship using the SIV® model method. Abouzeedan and Busler (2002b) have used the same approach of this work to study impact of firm age on performance. In the original analysis using SIV® model, the period upon which the investigation is based was standardized at one year (see Abouzeedan, 2001; Abouzeedan and Busler, 2002a). Such time-base is typical for SMEs, were firm performance reporting is not that frequent. Only larger corporations are required by the law to have more frequent reporting. Abouzeedan (2003a) proposed the term "*periodicity unit*" to indicate the length of the period upon which the SIV® analysis is used. He introduced, in the same reference, different periodicity units to give further strength to the analytical capacity of the SIV® model. Firm size is one of the two "*structural*" parameters incorporated in the SIV® model. Using that terminology is based upon the SPF-Classification Systems

(Abouzeedan, 2002a). The other *structural* parameter is the firm age (Abouzeedan, 2002a).

2. Review of the Literature

2.1. Background

There are a number of models used to evaluate firm performance. These models have different capacities, input requirements, and output characteristics. Abouzeedan and Busler (2002c, 2003b) investigated the existing firm performance models and advised strategies for their usage. In their analysis, the two researchers found the SIV® model to be the most suitable to use for evaluation of SMEs performance (see Abouzeedan and Busler (2002c, 2003b). Abouzeedan (2002b, 2003c) proposed the ASPEM, as a new tool to strategically approach the issue of which model or technique to use when deciding on the most suitable performance model to be applied. A good example for the application of the SIV® model can be found in Abouzeedan (2003d). In that work Abouzeedan (2003d) ran a SIV® model analysis on an individual firm for the first time. Abouzeedan and Busler (2002b) used the SIV® model approach to study relationship between firm age and survivability. We think that such approach is also suitable to study relationship between firm size and survivability. The standard period unit upon which the SIV® analysis is performed is taken as one year. Abouzeedan (2003a) introduced the terminology "*periodicity unit*" to define the period unit used for such an analysis. Abouzeedan (2003a) introduced even other variations of usable periodicities.

2.2. Firm performance and management issues

Though the link between competitive advantage and export performance seems reasonably documented, the often-expected link between firm size and competitive advantage has not been given much attention by empirical studies. This issue is important; not least when noting the contradicting results from investigations into the direct relationship between firm size and export performance as reported by Moini (1995), Aaby and Slater (1989) and Madsen (1987). Cavusgil and Zou (1994) used this particular relationship between firm size and export performance as an example of an

issue with inconsistent results in empirical studies. According to Monk (2000), the most significant reason for the high failure rate of SMEs is their inability to make adequate use of essential business and management practices. Although, at this stage of development, the SIV® model does not incorporate owner/manager or human capital parameter (see Abouzeedan, 2002a), still it is clear that the SIV® model is able to help managers to understand how their firms are functioning and facilitates better understanding for their situation. The pressure on chances of survival in an industry is certainly greater for smaller firms than for their larger rivals (Aldrich and Auster, 1986; MacMillan, 1980). To encourage stability and growing in the small to medium-sized business sector and to establish competitive firms, there is a need for business skills for SMEs managers (Monk, 2000). According to (Castrogiovanni, 1996), pre-start planning is considered beneficial to the extent it facilitates business survival. This "survival focus " is important due to three reasons. First, survival may be the primary concern of new businesses (Scott and Bruce, 1987). Second, survival is a necessary precondition of most other desirable outcomes as profitability or growth (Robinson, Bruce, 1984). Third, focus on a single outcome enhances conceptual clarity since planning may have differential impacts on alternative outcome variable (Bracker and Pearson, 1986).

A firm can be considered small in two different but related ways. In terms of sheer organizational size or in terms of it's industry market share. Although size and market share are conceptually different, empirically, they are correlated (Chen and Hambrick, 1995). Organisation size has long been considered one of the contingencies variables in macro organizational studies (Kimberly, 1976). According to Bonaccorsi (1992), all authors state that empirical findings on relationship between firm size and export behaviour are mixed and conflicting. A possible explanation for this confusion is that researchers do not take into account the situation in which the small company is finding it-self within. We argue that the SIV® is a stronger analytical tool of SMEs performance. In the SIV® model approach, companies having a positive slope of their SPI differ from the ones with a negative or near zero slopes for their SPI (Abouzeedan, 2001; Abouzeedan and Busler, 2002a, Abouzeedan and Busler, 2003a). In our opinion, such classification is recommended when studying the different factors effecting company performance including firm size. On the conceptual level, size is often classified as a part of the firm's characteristics and is expected to influence export performance directly or

indirectly (Aaby and Salter, 1989; Madsen, 1987; Holzmuller and Kasper, 1991; Cooper and Kleinschmidt, 1985; Styles and Ambler, 1994).

Managers should be also aware of the tremendous impact that the IT is already imposing on SMEs performance. In such regard management questions becomes even more important. Abouzeedan and Busler (2002d) studied IT impact on SMEs performance, while Abouzeedan, Busler and Khodabandehloo (2003) investigated possibilities and problems related to the electronic commerce (EC). In their work, they introduced new management concepts such as "*Localized Management*", "*Networking Management*", and "*Internetisation Management*".

2.3. Firm performance and size of SMEs

The empirical results presented by Moini (1995) suggested that the larger companies performed better, while Holzmullar and Kasper (1991), Bonaccorsi (1992) and Calof (1993) did not identify any significant relationship between firm size and export performance. According to (Castrogiovanni, 1996) performance of SMEs have three different indicators, survivability, profitability and growth. There is clear interest in research of the size effect on the activity of exporting SMEs (Calof, 1993; Bonaccorsi, 1992). The severity of managerial problems varies by firm attributes, including size, problems of domestic demand, the availability of alternative sources of finance, a lack of financial expertise and lack of information about financial options were particular problems of smaller (micro) operations (Orster, Hogarth-Scott, and Riding, 2000).

According to Orster, Hogarth-Scott, and Riding (2000), growths appear to be associated with age of firm, size of business sector, having business plan and being proprietorship. Abouzeedan and Busler (2002b) used the SIV® model to, investigate age effect on survivability of SMEs. Company smallness has been credited with increasing flexibility in production (Fiegenbaum and Karnani, 1991), price (MacMillan, Hambrick and Day, 1982; Tellis, 1989) and with enhancing speed (Katz, 1970) and risk-seeking behaviour (Hitt, Koskisson, and Harrison, 1991; Woo, 1987). Size is likely to affect the way small firms behave when initiating competitive attacks. Structural simplicity and streamlined operations allow small firms to be flexible and execute attack quickly (Chen, Hambrick, 1995). One of the most important arguments has been that larger firms have more resources (financial, technological, personnel) or are able to achieve economics of scale making them more competitive in international market (Aaby and Slater, 1989).

According to Carroll (1984), small firms often focus on certain market niches and hence to make competitive move in limited domains enhancing swiftness. Strategically, they may have a greater need than their larger rivals to surprise their competitors and maximize market impact against rapid execution. The basic assumption has often been large companies are better able to compete in international markets than small companies (Bonaccorsi, 1992; Calof, 1993). Researchers like Bonoccorsi (1992) and Moini (1995), pointed out that the influence of firm size on companies export behaviour and performance has been one of the issues most focussed upon in international marketing research. There are many investigations into the direct relationship between firm size and export performance (Moini, 1995; Aaby and Slater, 1989; Madsen, 1987), expected link between size and competitive advantage has not been given much attention by empirical studies according to Moen (1999). This issue is important, not least when noting the contradicting results from investigations into direct relationship between firm size and export performance (Moen, 1999).

One issue of concern is the type of firms, which are born in the Internet age and whether size of firm is becoming unrestricting factor of firm performance. According to Katz (2002), the advent of the Internet has brought about a new form of business organization, called *Virtual Instant Global Enterprise* (VIGE). It builds on the existence of particular structures and structured processes on the Internet, that when utilized result in the creation of a firm in the *virtual* world. The resulting firm is global from its inception, offering sales worldwide, with structures or structured processes often facilitating global financial exchanges (e.g. currency movements and conversions).

2.4. Company size and SMEs exporting activities

A distinction is often made between studies which include size as a possible factor when identifying differences between exporting and non-exporting firms (Calof, 1993; Ali and Swiercz, 1991; Yaprak, 1985; Keng and Jiuan, 1989) and studies focusing on the relationship between company size and export performance (Walter and Samiee, 1990; Culpan, 1989; Styles and Amber, 1994). According to Albaum, Strandskov, and Duerr (1994), the driving forces behind an export venture may be different for each company, in turn affecting their export behaviour and priorities. Bonaccorsi (1992) concluded that earlier research did not consistently support the notion that small firms should have a lower export involvement than larger firm.

Moini (1995) pointed out that no definitive conclusions could be drawn from past research on the relationship between export success and the size of the firm. The empirical results presented by Moini (1995) suggested the larger companies performed better while Holzmuller and Kasper (1991), Bonaccorsi (1992), and Calof (1993) did not identify any significant relationship between firms size and export performance. If small exporting companies could be expected to have competitive advantages they would most likely be linked to their technological level or product characteristics (Moen, 1999). The above notion is supported by recent research focusing on firms that started exporting short time after establishment. Most of these companies are small (Moen, 1999). This phenomenon is called " International New Ventures" (McDougall, Shane, and Ovaitt, 1994) or "Born Globals" (Rennie, 1993; Madsen and Servias, 1997).

3. Methodology

In this work we used the SIV® Model (Abouzeedan, 2001; Abouzeedan and Busler, 2002a), as our major tool for studying the effect of size enterprise on survivability. The basic component in the SIV® model is the Survival Index Value (SIV®) Equation, which is used to calculate the Survival Index Value, SI_{ij}.

$SI_{ij} = SI_{oi} + SI_{ti}$ (the SIV® Equation) *Where,*

$$SI_{oi} = A_a \left(\frac{Y_i}{L_j}\right)\left(\frac{E_i}{E_x}\right)\left(\frac{F_i}{C_{3i}}\right) P_i + A_b \left(\frac{C_{1si}}{C_{1i}}\right)$$

and

$$SI_{ti} = A_c \left(\frac{C_{2i}}{C_{3i}}\right)$$ Such that,

SI_{oi} represents the operating conditions part of the Survival Index, for the i[th] enterprise, called *Operating Conditions Survival Index*.

SI_{ti} represents the technology intake part of the Survival Index, for the i[th] enterprise, called *Technology Intake Survival Index*.

Where;

E_i is the number of employees of the i[th] enterprise.

E_x is the maximum number of employees distinguishing the different categories of enterprises (e. g. E_{xs} = 200 employees for small companies). This value differs from a country to another as the definition of small companies size do also differs.

Y_i is the number of years since the ith enterprise has existed, called Years of Operation.

L_j is the Average Life Span for the jth business sector.

F_i is the annual sales (turn-over), the ith enterprise generates (in US Dollar or other currency) per year.

C_{2i} is the intake and absorption of new technologies indicated by the annual investment (in US Dollar or other currency), per year, for the ith enterprise in such technologies.

C_{3i} is the total costs of production (US Dollar or other currency), per year, for the ith enterprise.

C_{1i} is the initial investment costs (US Dollar or other currency) for the ith enterprise.

C_{1si} is the Self-financed initial capital of investment (US Dollar or other currency) for the ith enterprise.

P_i is the profit margin (a neutral percent figure), for the ith enterprise.

A_a, A_b and A_c are proportionality factors used to adjust segments of the SIV® equation so that the product shall be of close approximately in power order, to each other.

The " *Structural* " parameters, Enterprise Size, E_i, and Years of Operation *Yi*, are incorporated in the Operating Conditions Survival Index part of the equation. The term "*structural parameters*" is designated to these parameters in accordance with the SPF classification system (see Abouzeedan, 2002a). The parameter, L_j, is the Average Life Span for the jth business sector. Abouzeedan (2003e) analysed further the types of Average Life Span, which are feasible to use for the SIV® analysis techniques. The ratio $\left[\frac{Y_i}{L_j}\right]$ is defined as the Relative Age of Enterprise (see also Abouzeedan and Busler, 2002b). We wish to point out that all the data used in this article are extracted from the major work of the Survival Index Value (SIV®) Model (Abouzeedan, 2001; Abouzeedan and Busler, 2002a).

We used the information regarding enterprise size, E_i, and the maximum enterprise size, expressed as number of employees, of the SMEs, E_{xs}, to calculate the Relative Size of Enterprise defined as the ratio between E_i and E_{xs}. We have adapted the Swedish definition of small company size in our calculation for the value E_i/E_{xs} as we were using data for Swedish SMEs (Abouzeedan, 2001; Abouzeedan and Busler, 2002a). Thus E_{xs} was taken to be equal to 200 employees (NUTEK, 1994). Abouzeedan (2003f) standardized the nomenclatures of the border size-value for the different SMEs categories to be used in the SIV® model. The Survival Progression Indicator (SPI) slope is used to separate the enterprises into three categories (Abouzeedan, 2001; Abouzeedan and Busler, 2002a, Abouzeedan and Busler, 2003a). The first category was firms with positive SPI slope. The second group had a near zero slope for their SPI lines. The third had a negative such one. We plotted the values of E_i/E_{xs} and SI_{ij} for each year against number of points of data (corresponding to the number of enterprises) for each of the three categories. That made it possible to study the effect of firm size on company performance and survivability.

4. Results

To evaluate the effect of enterprise size on the SI values for the group of companies, within the sample, which have a positive slope for their SPI line, we used data from Tables I and II. The resulted graphs are displayed in Figures 1. It is to be noticed that the Relative Size of Enterprise E_i/E_{xs} values were increased by a factor of 1000 in order to create conditions allowing for visual comparison between the two lines composing the graphs. In plotting the diagrams, we arranged the SI values in ascending order, as the Relative Size of Enterprise (Ei/Esx) values were identical for some companies, because they had the same number of employees. Examining the four graphs of Figure 1, we observed that company size is not strongly related to the SI values. Survivability of this group of companies is not affected strongly, in positive way, by their size increase. This is important because a lot of decision makers in SMEs management do think that size growth improves their companies' performance and thus survivability. The above shows that it is not a clear-cut case. The graphs in Figure 1, indicate that size-growth does not have a decisive positive effect on performance and survivability of SMEs with the group

characterized by a positive PSI slope. On the contrary, size growth may have a negative effect on survivability, if the result-related parameters did not compensate for the additional costs caused by growth. Managers should concentrate on performance growth instead of size growth. Actually, the optimum strategy is to concentrate on performing better with the same number of employees. It is worthy also to point out that the graphs in Figure 1, do not indicate whether decreasing the size of the company has a reverse effect on survivability.

To evaluate the effect of enterprise size on the SI values for the group of companies, which have near zero slopes for their SPI line, we used data from Tables III and IV. The resulted graphs are displayed in Figure 2. It is to be noticed that the Relative Size (Ei/Esx) values were increased by a factor of 1000 in order to create conditions allowing for visual comparison between the two lines composing these graphs. From the graphs in Figure 2, it appears that a clear and sharp increase of the SI values starts to occur when the Relative Size of Enterprise is around 0.01, giving an actual value of company size equal to 20 employees. There is no evidence of the significance of that figure, except that it is repeated for all the four graphs of the figure. The explanation for the fact that company size does increase sharply the survivability of enterprises with near zero SPI slope is similar to the age effect on the same group (see Abouzeedan and Busler, 2002b). The *result-related* parameters for this category of companies are not predominant in this case. Probably, that is why the *structural* parameters (age and size of enterprise) take over and do play more significant role in enhancing survivability of SMEs. The graph for the year 1998 do follow also the same pattern, but due to the range of the SI values, we could not determine at what size of enterprise did the sharp increase of SI values for that graph started, although it appears to be around that figure.

To evaluate the effect of enterprise size on the SI values for the group of companies, which have a negative slope for their SPI line, we used data from Tables V and VI. The resulted graphs are displayed in Figure 3. It is to be noticed that the Relative Size (Ei/Esx) values were increased again by a factor of 1000 in order to create conditions allowing for visual comparison between the two lines composing these graphs. The graphs in Figure 3, indicate that size of enterprise for this category is not strongly tied to the SI values. Increasing the company volume, it seems, does not enhance the survivability. An exception is the diagram for 1996, where it appears that performance is enhanced by increasing the size. This is may be due to generally higher SI values for that particular year due to extraordinary performance of the firms, relative to the other years.

TABLE I

The Relative Size of Enterprise (Ei/Exs) and The Survival Index (SI) Values for Companies with Positive Slope of The Survival Progression Indicator (SPI) for the Years 1996 and 1997.

Year	1996			1997			
Co. No.	Ei	Ei/Exs	SIij	Co. No.	Ei	Ei/Exs	SIij
33	50	0.250	-7525.8	33	48	0.240	-8354.6
35	11	0.055	-82.089	35	1	0.005	-63.937
39	10	0.050	-11.875	13	10	0.050	-17.383
10	12	0.060	-5.450	26	2	0.010	-5.834
2	5	0.025	-0.796	1	2	0.010	0.465
14	6	0.030	0.466	14	5	0.025	0.901
5	4	0.020	1.057	18	3	0.015	1.277
19	2	0.010	2.646	5	4	0.020	1.373
1	*	*	*	10	10	0.050	1.777
26	1	0.005	3.160	19	7	0.035	3.323
18	3	0.015	4.969	2	4	0.020	4.384
6	5	0.025	6.534	6	4	0.020	14.263
27	21	0.105	13.277	15	20	0.100	26.872
13	10	0.050	18.460	39	10	0.050	29.486
15	11	0.055	19.971	34	7	0.035	34.710
38	9	0.045	23.874	38	17	0.085	57.592
25	19	0.095	71.936	27	26	0.130	58.218
22	10	0.050	324.279	22	10	0.050	215.561

* Data not available

TABLE II

The Relative Size of Enterprise (Ei/Exs) and The Survival Index (SI) Values for Companies with Positive Slope of The Survival Progression Indicator (SPI) for the Years 1998 and 1999.

Year			1998		1999		
Co. No.	Ei	Ei/Exs	SIij	Co. No.	Ei	Ei/Exs	SIij
33	31	0.155	-1355.9	33	27	0.135	-1356.8
35	1	0.005	-63.937	1	3	0.015	0.407
1	3	0.015	0.500	2	4	0.020	2.356
14	5	0.025	1.155	14	6	0.030	2.459
5	5	0.025	2.825	19	12	0.060	4.864
6	4	0.020	5.050	5	7	0.035	6.384
19	11	0.055	5.572	26	12	0.060	9.351
18	4	0.020	8.511	10	10	0.050	15.034
2	4	0.020	10.000	39	12	0.060	23.717
10	10	0.050	11.898	6	4	0.020	24.875
26	5	0.025	12.692	27	38	0.190	29.511
27	35	0.175	15.642	15	43	0.215	44.220
13	9	0.045	20.205	13	9	0.045	47.678
15	30	0.150	33.682	18	6	0.030	100.156
34	9	0.045	56.421	34	11	0.055	112.743
39	12	0.060	107.448	22	11	0.055	370.241
22	10	0.050	275.976				

TABLE III

The Relative Size of Enterprise (Ei/Exs) and The Survival Index (SI) Values for Companies with Near Zero Slope of The Survival Progression Indicator (SPI) for the Years 1996 and 1997.

Year			1996	1997			
Co No.	Ei	Ei/Exs	SIij	Co. No.	Ei	Ei/Exs	SIij
9	4	0.020	1.637	7	4	0.020	-47.174
7	4	0.020	1.725	9	5	0.025	2.093
16	9	0.045	10.473	16	9	0.045	6.930
8	17	0.085	64.840	8	26	0.130	18.860
20	29	0.145	569.359	20	31	0.155	472.164

TABLE IV

The Relative Size of Enterprise (Ei/Exs) and The Survival Index (SI) Values for Companies with Near Zero Slope of The Survival Progression Indicator (SPI) for the Years 1998 and 1999.

Year	1998			1999			
Co. No.	Ei	Ei/Exs	SIij	Co. No.	Ei	Ei/Exs	SIij
9	8	0.040	1.086	9	8	0.040	1.760
16	8	0.040	5.101	7	2	0.010	3.434
7	4	0.020	5.259	16	7	0.035	10.320
20	36	0.180	533.038	8	34	0.170	76.734
8	34	0.170	1710.91	20	36	0.180	549.684

TABLE V

The Relative Size of Enterprise (Ei/Exs) and The Survival Index (SI) Values for Companies with Negative Slope of The Survival Progression Indicator (SPI) for the Years 1996 and 1997.

Year			1996		1997		
Co. No.	Ei	Ei/Exs	SIij	Co. No.	Ei	Ei/Exs	SIij
37	4	0.020	-5.5420	29	19	0.095	-89.509
30	10	0.050	3.172	28	3	0.015	-2.754
4	4	0.020	4.864	30	10	0.050	0.364
31	6	0.030	13.563	37	7	0.035	7.147
28	9	0.045	13.967	4	8	0.040	9.264
21	19	0.095	48.439	31	7	0.035	11.903
32	14	0.070	57.553	11	6	0.030	19.551
23	28	0.140	64.677	21	19	0.095	22.670
29	20	0.100	122.584	32	17	0.085	45.747
36	7	0.035	189.891	23	33	0.165	54.350
24	45	0.225	199.939	24	47	0.235	66.9
3	39	0.195	215.937	12	17	0.085	80.601
12	19	0.095	255.070	36	7	0.035	143.554
				3	41	0.205	271.537

This can be noticed when comparing the SI values of 1996 with the one for 1997, 1998 and 1999. It is important also to notice that, there is no evidence from the graphs in Figure 3, indicating that reduction of the size of enterprise will help these companies and enhance their survivability. This is important because SMEs managers tend to rely

TABLE VI

The Relative Size of Enterprise (Ei/Exs) and The Survival Index (SI) Values for Companies with Negative Slope of The Survival Progression Indicator (SPI) for the Years 1998 and 1999.

Year			1998	1999			
Co. No.	Ei	Ei/Exs	SIij	Co. No.	Ei	Ei/Exs	SIij
29	13	0.065	-11.209	21	17	0.085	-42.678
30	8	0.040	1.161	23	1	0.005	-37.638
4	11	0.055	1.737	37	15	0.075	-11.055
21	17	0.085	10.329	4	16	0.080	-8.652
31	8	0.040	12.949	30	10	0.050	1.658
37	13	0.065	13.459	11	3	0.015	2.874
11	6	0.030	21.162	31	6	0.030	7.512
32	18	0.090	71.169	36	7	0.035	22.442
36	7	0.035	102.193	29	11	0.055	29.355
12	19	0.095	142.907	32	19	0.095	36.005
3	41	0.205	177.723	12	19	0.095	177.356
23	14	0.070	858.076	3	42	0.210	198.802

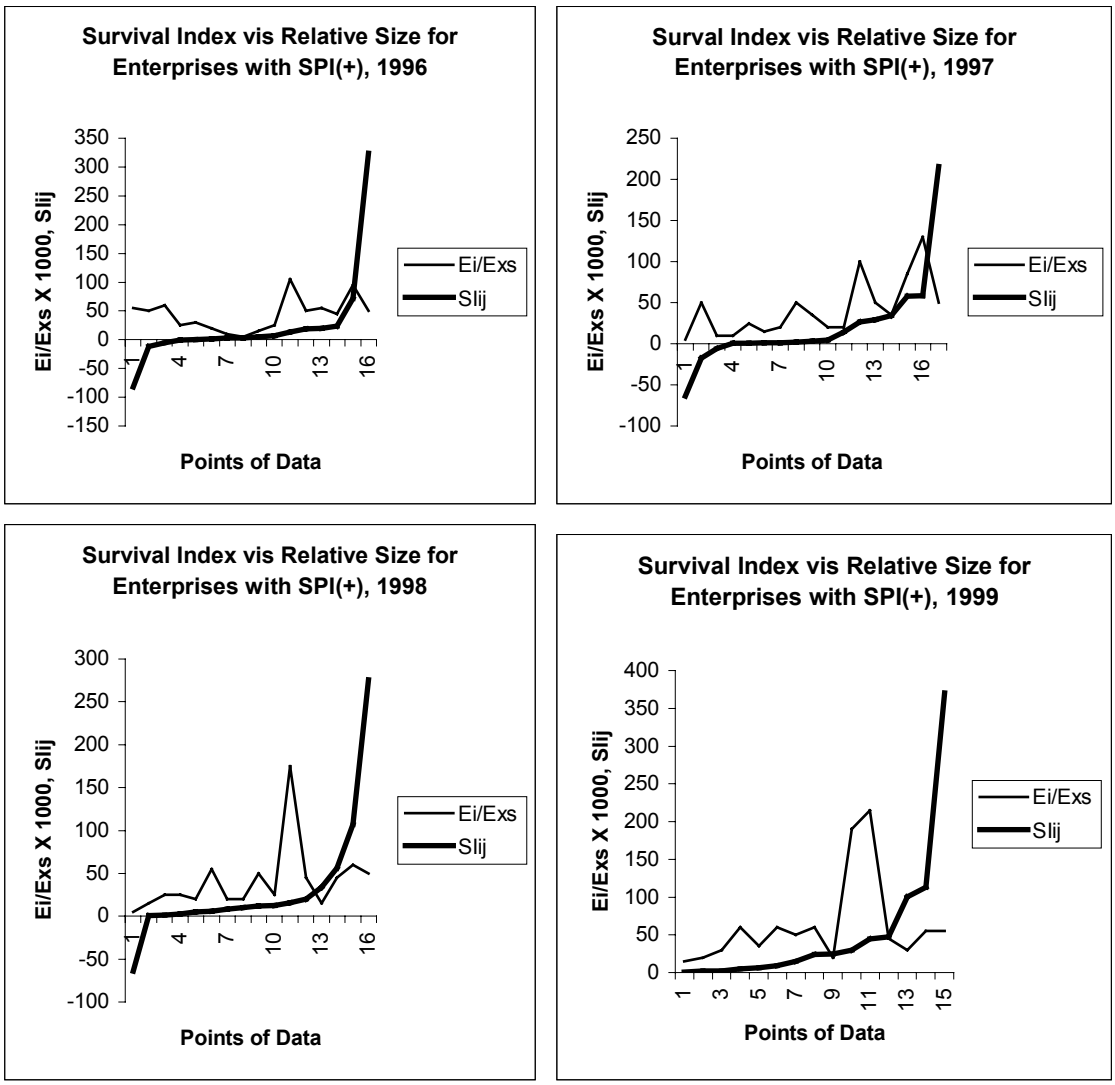


Figure 1: The Survival Index (SIij) vis Relative Size of Enterprise (Ei/Exs) for Companies With Positive Slope of The Survival Progression Indicator (SPI) for Years 1996, 1997, 1998, and 1999.

heavily on the process of reducing the work force in the company in the belief that this will save it from collapsing. Again for companies with negative SPI slope, the solution is not to work on manipulating the structural parameters and decreasing the size of the company. It is more productive to concentrate on improving the result-related parameters in order to move into the category of companies with near zero SPI slope.

5. Conclusion

In this work we studies the effect of firm size on the performance of SMEs using survivability as an indicator. The analytical tool we used is the SIV® model. We found that for the group of firms in the sample with a positive SPI slope or a negative one, firm size does not enhance positively firm performance. We found evidence contrary to the common understanding that size reduction for companies in trouble would increase survivability of firms. The only group of firms which, for some degree showed, a better performance with firm size increase are the ones with a slope of SPI near zero. A possible explanation is that firm size, which is a structural parameter, plays larger roll within this group as the financial parameters are less significant. There is also variation of performance level within the same SPI group depending on the input data under which performance is measured. A firm, from any of the SPI groups; may perform extraordinarily at some years, the reverse can occur. Firms can perform badly in some years relative to their overall performance. Finally, we have to admit, that due to limitation in sample size, the conclusion we are presenting has to be taken with some caution. However, these conclusions can serve as guidelines and direction-pointer for future studies using the same technique, but with larger sample. Most in need to be expanded in their numbers are firms with the group that has an SPI slope near zero, because they were the smallest group of the three SPI categories.

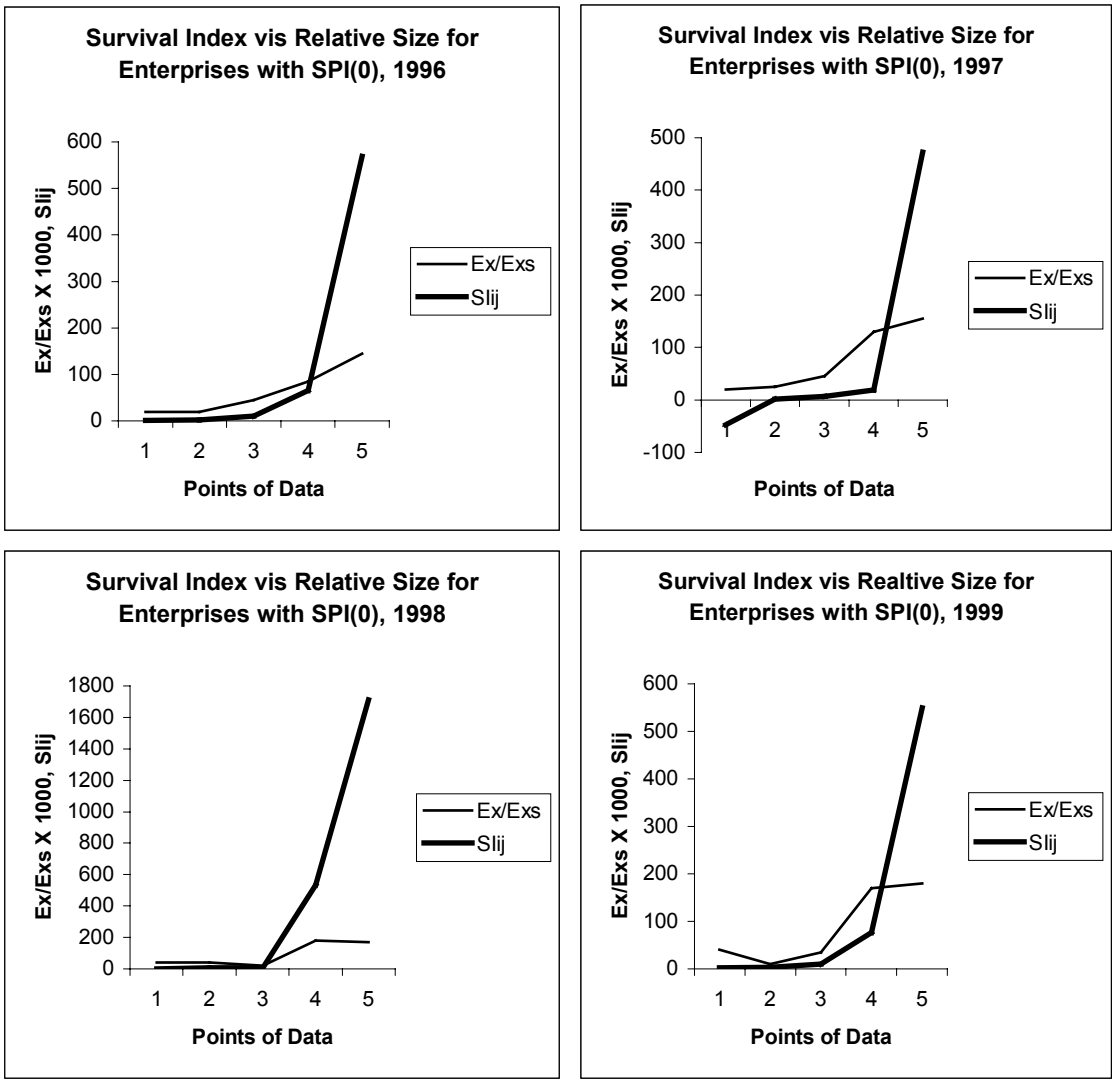
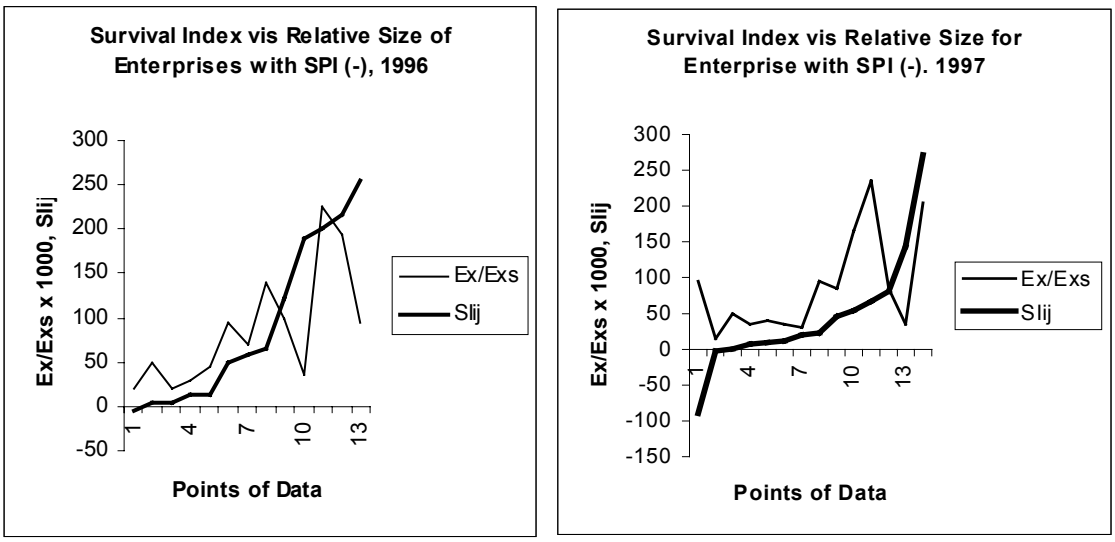


Figure 2: The Survival Index (SIij) vis Relative Size of Enterprise (Ei/Exs) for Companies With Near Zero Slope of The Survival Progression Indicator (SPI) for Years 1996, 1997, 1998, and 1999.



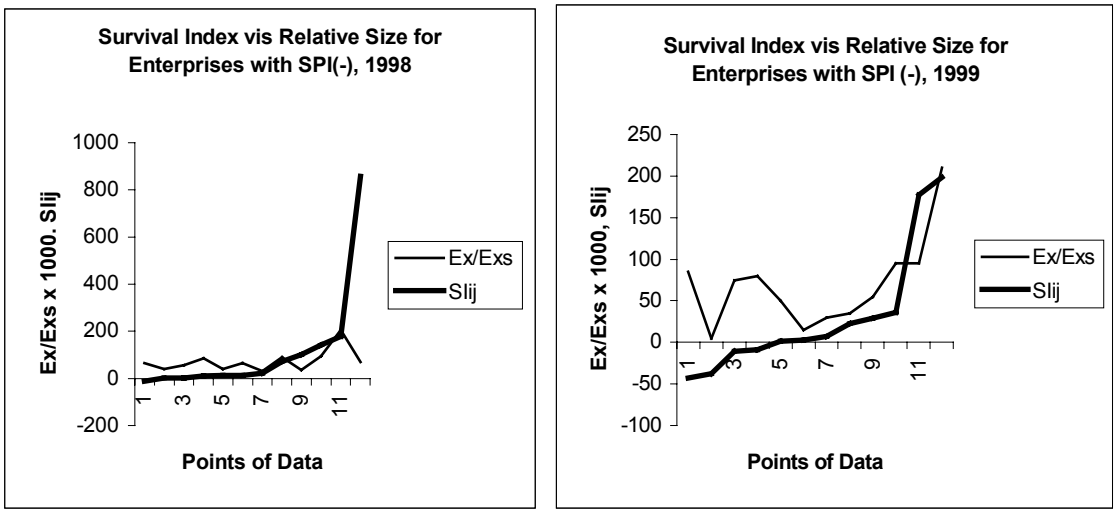


Figure 3: The Survival Index (SIij) vis Relative Size of Enterprise (Ei/Exs) for Companies With Negative Slope of The Survival Progression Indicator (SPI) for Years 1996, 1997, 1998, and 1999.

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