Global Journal of Economics and Business (GJEB)

Volume.12, Issue.1, pp: 118-137 Article 8
Feb (2022)

The Factors of Success and Failure in Small Industrial Business: A Case of Asir Region in Saudi Arabia

Fuad Saeed Saad [1], Mohamed Abu Elgassim Hassanen [2], Fath Elrahman Shaa Eldeenm [3], Hamoud Mohammed Alomar [4]

[1,2,3,4] College of Business, King Khalid University, KSA

[1] fusaad@kku.edu.sa

Received: 12/12/2021 Revised: 26/12/2021 Accepted: 6/1/2022

DOI: https://doi.org/10.31559/GJEB2022.12.1.8

www.refaad.com

المجلة العالمية للاقتصاد والأعمال

Global Journal of Economics and Business (GJEB)

Journal Homepage: https://www.refaad.com/Journal/Index/2

E-ISSN 2519-9293 | P-ISSN 2519-9285

The Factors of Success and Failure in Small Industrial Business: A Case of Asir Region in Saudi Arabia

Fuad Saeed Saad [1], Mohamed Abu Elgassim Hassanen [2], Fath Elrahman Shaa Eldeenm [3], Hamoud Mohammed Alomar [4]

[1,2,3,4] College of Business, King Khalid University, KSA
[1] fusaad@kku.edu.sa

Received: 12/12/2021 Revised: 26/12/2021 Accepted: 6/1/2022 DOI: https://doi.org/10.31559/GJEB2022.12.1.8

Abstract: The factors associated with small industrial business have a significant impact on their performance and they need to be determined considering their contribution to the business performance. This study aims to recognize a set of variables that have the paramount impact on the performance of small industrial business. It also constructs a statistical model that is used to estimate the probability of faltering for any small industrial enterprise, and to determine its expected survival time. It applies cluster analysis to classify depending on variables, i.e., faltering and non-faltering using Cox's regression model. Incredibly, the obtained results show that (i) the most influential variables affecting the success or failure of a small industrial business are: establishment expenses, workers' wages, and cost of marketing products, (ii) the maximum degree of risk to small industrial business was during the fifth, sixth and seventh years, and the average lifetime of a small industrial enterprise ranged from 8 to 9 years. The results indicate that stakeholders must consider the faltering variables when making business decisions and looking into the policies' implementation after the ninth year of the variables' adoption.

Keywords*: Cluster analysis; Cox's regression model; faltering; small industrial business.*

1. Introduction

Small and medium enterprises (SMEs) are considered to be one of the pillars of the national economy as they are the largest employer of the labor force. They contribute to increasing the national economy by generating revenues from taxes and duties imposed on the products they produced. SMEs have a significant role in contributing nations' economies across the world. These industries play a vital role in the development of human and physical resources following national goals and needs. Since such enterprises are the steppingstone for the large and successful business establishments. SMEs are gaining great importance as one of the tributaries of economic development, based on their contribution and addressing the problem of youth unemployment, raising the pace of employment in the private sector, and supporting economic activities. SMEs are of the utmost importance in supporting the national economy and advancing economic and social development, increasing exports, reducing imports, creating new job opportunities, opening job markets, diversifying income sources, and expanding production base in all sectors. In a study by UNIDO, it was found that 90% of the business in the world are small enterprises, and these businesses are responsible for 60% of total employment. Thus, the development of these small businesses is vital, and government should support such industries, initialize the ease to business environment in these sectors.

By realizing the significant importance, a decision of Saudi Council of Ministers was issued in 26th of October 2015 approving the establishment of "the General Authority for Small and Medium Enterprises". It is a body with legal personality with financial and administrative autonomy. It seeks to review regulations, remove barriers, and regulate the sector of SMEs in Saudi Arabia. It supports, develops, sponsors them, facilitate access to finance, and assist creative young people marketing their ideas and products. One of the indicators of the government's interest in this vital sector is that its contribution to the GDP should increase from 21% to 35% by 2030 according to the Kingdom's vision.

1.1. Problem statement

Table 1 includes the two important small business key performance indicators that reflects the weakness of the role of these enterprises and their poor performance to achieve their objectives in Saudi Arabia.

Table (1): Small business key performance indicators

The state	Contribution to GDP %	Employment generation
Saudi Arabia	21	53
USA	50	48
Japan	52	-
Germany	54	-
China	60	60
Advanced economies	46	67

A large volume of studies has ignored the quantitative side of SMEs (Beaver, G., 2003; Everett, J. Watson, 1988) and they have been more focused with the theoretical aspects. Noticeably, such studies randomly overlook the crucial aspects, such as the relationships between the variables that affect the performance and the reason behind the faltering (Affifi A., et.al. 2004) of small businesses. Remarkably, the presented study determines the knowledge gaps and addresses by proposing a statistical model. The novelty of the proposed model is that it identifies the most significant variables that have the major cause of the failure of such enterprises. Further, the model has the ability to determine the degree of risk facing by such businesses. Thus, decision makers should consider an integrated strategy, i.e., the proposed model, to optimize the benefits of small businesses and contributing in the development of Saudi economy.

1.2. Study's objectives and significance

- To determine the set of variables that have significant impact in evaluating the performance of small industrial enterprises, and then classify them into faltering and non – faltering business.
- To develop a statistical model and use it in determining the degree of risk facing small industrial enterprise, then estimating the probabilistic value of faltering of new one, and the expected survival time of the small industrial business in the market.

1.3. Scope of the study

Small industrial enterprises (SIEs) issues have a major scope of research, and it attracts the attention of economic authorities. This issue appears frequently on the economic arena to encourage such efforts for the development of SIEs. Importantly, these efforts need to stimulate with the growing SIEs needs and how effectively these efforts contribute in improving the national economy.

In spite of the many studies conducted on this small industrial business, the issues are still need more attention. Thus, the current study draws its importance and emphasis on the vital and major role of small industrial enterprises in the following aspects:

- provision of real and productive job opportunities.
- combating unemployment.
- balance the structure of Saudi industrial activity.
- export development.
- substitution of imports.
- provision of industries supporting large and medium industrial activities.

1.4. Study's significance

The practical significance, results, and findings of this study shall meet the needs of small enterprises in Saudi Arabia. However, to determine the factors of faltering small industrial business, that should be taken into consideration in the design of aids and programs provided to these enterprises. In addition, this study will provide a tool or a model that can be used to evaluate the performance of such businesses, and estimate the degree of success, and thus help successful, non – successful, and less successful businesses addressing their problems.

1.5. Study's population definition

The study's population is represented by 930 small industrial enterprises in Asir Region[1] . The authors of the study decided to examine all the population's units. But the received questionnaire responses were around 90%, i.e., 842. The responses were collected without considering faltering and non – faltering enterprises.

2. Literature Review

Small firms are a sector of great concern for government policies. In the last few years, Saudi government has developed several policies considering small firms' developments and has spent a significant number of resources to improve such firms' performance.

[1] Commerce Chamber, Abha.

There is a literature gap in this context and studies that consider the role of small business in Saudi economy are needed. Since it contributes a lot in developing the nation's economy. There are broad categories of causes of failures have been identified, such as managerial inadequacy, financial inadequacy, and the external factors. Managerial inadequacy is generally perceived as the major cause of small business failure. Unfortunately, this term encompasses a very broad set of issues. It has been estimated that two thirds of small business failures are due to incompetence of the owner management. (Beaver, G., 2003) discussed that the management has ineffective communication approach with employees and with the customers to be a marker for failure. The inability to listen to criticism or divergent views and not flexible in thinking approach are the proven reasons for the failures (Nelton, S., 1992). Steck, R.N. (1985) emphasized the manager's abilities contributing the failures. Garbone, T. (1981) mentioned the inability of managerial skills in the functional area of marketing. There is obvious evidence of the firms' failures that they do not take seriously to change customers' demands which reflects into devastating effects (Atamain, R., and Van Zanle, |N.R., 2010).

The other major cause due to the failures of business firms is dealing with finance. Generally, financial problems fall into three categories – start-up, cash flow, and financial management. For instance, when a firm begins its operation (start-up), it requires a capital investment. Unfortunately, many small business owners initially underestimate the amount of capital that should be available for operations. Upton, H. (1992) explained why most small firms that fail do so within the first few years of their establishment. Since the reason is to start without sufficient capital investment or the owner could not estimate the financial requirement properly. Subsequently, cash-flow management has been identified as a primary cause of failure (Atamain, R. and Van Zante N.R., 2010). Good cash-flow management is essential for the survival of the firm, but small business in particular must pay close attention to this process. Indeed, small business must develop and maintain effective financial controls such as credit controls (Brown, R., 2009).

The last major factor identified with the failure of small business is the external environment. These are potentially infinite list of causes, but the economic environment tends to be most prominent. Here confusing appears to describe the list. Some argued that economic conditions contribute to between 30 percent and 50 percent to the belief that management incompetence is the major cause (Everett, J. and Watson, J., 1998). Two economic measures appear to affect failure rates: interest rates, which appear to be tied to bankruptcies, and the unemployment rate, which appears to be tied to discontinuance (Everett, J., and Watson, J., 1998).

3. Methodology

The current study has adopted two models for statistical analysis, they are (i) cluster analysis and (ii) Cox's regression model.

3.1. Cluster analysis

The study's approach includes cluster analysis to identify and classify the dependent variable for Cox model. Cluster analysis is a statistical technique used to group observations or individuals into groups or clusters. Its objective is to group such that each cluster is homogenous as possible with respect to the clustering variables. That is, the behavior of the units of the study in the clustering variables is the ruling basis in the units' affiliation to these mutually exclusive groups.

3.1.1. Cluster variables

Here, three variables are used to the researchers used three variables to classify the dependent variable in context to faltering or non – faltering. The following are the three variables:

- C1: Loan (credit) amount (SR 000).
- C2: The loan repayment period (years).
- C3: The number of national labor.

By following cluster analysis, some characteristics of the populations to which observations, that are relatively similar, which may belong are identified. The degree of this relative similarity is determined by measuring the distance between the observations– measuring similarity between the observations by creating a similarity matrix. The rows of the matrix represent the small industrial business, and the columns describe the clustering variables. The following are the methods used in this process:

- Euclidean distance.
- square Euclidean distance.
- size difference.
- shape.
- chi-square.
- phi-square.
- cosine; and
- Person correlation.

Next, a clustering technique should be selected. There are two main types of analytical techniques: hierarchical, and non-hierarchical. The hierarchical clustering technique is selected since the number of clusters need not to be known in prior to this technique. In continuation, a number of different methods have been suggested for calculating distances between two clusters. Punj and Stewart (1983) have provided comprehensive summaries of the various clustering algorithms and the empirical studies which have compared those methods. In fact, the various hierarchical algorithms or methods differ mainly with respect to how the distances between the two clusters are computed and the following methods are used:

- between groups linkage.
- within groups' linkage.
- nearest neighbor, or single linkage method.
- furthest neighbor, or complete linkage method.
- centroid clustering.
- medium clustering; and
- Ward's method.

The above seven hierarchical methods are activated with the already mentioned eight methods used to determine the distances between the observations, as a result, 8x7 scenarios are obtained. Later, the scenarios are filtered through the following criteria:

- the relative balance of the number of observations categorized within each group as follows:

$$|G_i| \cong |G_j|; \qquad i \neq j$$

- the unit of the study is not marginalized. This implies that there is no single study unit falls outside the scope of the groups, i.e,

$$O_i \in G_j; \qquad i = 1, 2, \ldots\ldots, 842;$$
$$J = 1, 2, ..n.$$

- conducting a one-way analysis of variance test between the classified groups and verifying the presence of significant differences between the groups with respect to the three clustering variables.

3.2. Cox regression model

This study has adopted the Cox Regression Model which is considered a statistical model that is widely used in the field of survival data analysis. The method is used to identify the most important variables that affect the survival of the small industrial enterprises or its failure.

The Cox regression model is one of the probabilistic statistical methods used to formulate a relationship between a set of independent variables known as risk factors and a dependent variable known as hazard rate or risk rate. This model is characterized by the fact that the survival time is not assumed to follow any probability distribution but rather that the effect of the variables on survival is equivalent to time. This model is also characterized by the fact that it accommodates variables of different types and nature: metric, non–metric, normal, or ordinal.

Cox's model (hazard or risk function) takes the form:

$$h_i(t) = h_0(t) * \exp(\beta_1 X_1 + \beta_2 X_2 + \ldots\ldots + \beta_k X_k) \qquad (1)$$

where: $h_i(t)$: the rate of risk to which the business is exposed at time (t), and it represents the dependent variable.

$h_0(t)$: the baseline for the risk function when all the independent variables are zero.

X's: the independent variables, and they represent risk factors.

By dividing the hazard function (equation (i)) by $h_0(t)$, we get the relative hazard function. This model is called the exponential model:

$$\frac{hi(t)}{h0(t)} = \exp(\beta_1 X_1 + \beta_2 X_2 + \ldots\ldots + \beta_k X_k) \qquad (2)$$

Taking the natural logarithm of both sides of the relative hazard function (equation (2)), we obtain the logarithm of the relative hazard function. This model is called the logarithmic model:

$$\text{Ln}\frac{hi(t)}{h0(t)} = \beta_1 X_1 + \beta_2 X_2 + \ldots\ldots + \beta_k X_k \qquad (3)$$

The parameters of the exponential and logarithmic models are estimated using the maximum likelihood method (MLM). These estimated parameters represent the expected relative change in the dependent variable due to the relative change in the independent variables.

3.2.1. Model significant tests

- **Significance of the Model Test**

The researchers used the Likelihood Ratio Test (LRT) to examine the significance of the model. LRT assesses the goodness of fitting of two competing statistical models based on their likelihoods, especially one found by maximizing over the entire parameters space, and another found after imposing some restrictions. The null hypothesis being tested assumes that only the intercept explains the dependent variable better than the estimated model. The test is based on comparing the likelihood ratio of the observed values of the dependent variable and the estimated values of the model. The likelihood ratio is calculated as follows:

$$D = -2 \text{ Ln } [L_0 / L_1] = -2 (\text{Ln } L_0 - L_1) \quad (4)$$

Where:

L_1: The maximum value of the likelihood function of the model Including all independent variables.
L_0: The maximum value of the likelihood function when all the Parameters except the intercept equal zero.

- **Significance Test of the Independent Variables**

Wald test, also called Wald Chi – Square test, was used to investigate the significance of each independent variable separately. It is a way to find out which explanatory variables are significant. The Wald value is obtained as follows (Agresti, 2012):

$$W_T = \frac{[\hat{\theta} - \theta_0]^2}{1/I_n(\hat{\theta})} = I_n(\hat{\theta})[\hat{\theta} - \theta_0]^2 \quad (5)$$

Where:
$\hat{\theta}$: The maximum likelihood estimator (MLE).
$I_0(\hat{\theta})$: The expected Fisher Information (calculated at MLE).

- **Confidence Intervals for Estimated Model Parameters**

The confidence intervals for the estimated parameters are calculated as follows:

$$\exp(\widehat{\beta_i} \pm Z * SE(\widehat{\beta_i}))$$

The confidence interval is used to find which independent variables are more influential and important for the dependent variable. As the confidence interval narrows for any independent variable, this indicates that this variable is more important and influencing the dependent variable.

3.2.2 Model's variables

- **Dependent variable**

It is a binary variable taking the value zero in the case of faltering small industrial enterprise, and the value one in the case of non – faltering business.

- **Independent variables**

They include:
X_1: The cost of the feasibility study for the small industrial business (SR 000).
X_2: The expenses of establishment (SR 000).
X_3: Rent of lands and building (SR 000).
X_4: The cost of machinery and operating equipment (SR 000).
X_5: Workers' wages (SR 000).
X_6: The cost of marketing products (SR 000).
X_7: The cost of obtaining information (SR 000).

Time variable: It is considered as the governed variable in the model. It represents the time period from the beginning of the current activity until:

- Now, when the business continues.
- The end of the business, whether by changing the activity, or finalizing the business once and for all.

4. Result and Discussion

4.1. Cluster analysis results

By examining and evaluating the fifty-six scenarios according to the criteria mentioned above, it is found that the best scenario is what is related to Ward's method which emphasized that the study's observations can be categorized into only two mutually exclusive groups and the following relative frequency distribution table shows the two classified groups.

Table (2): Relative Frequency Distribution of the Two Classified Groups

The group	Frequency	Relative frequency %
First	395	46.9
Second	447	53.1
Total	842	100

Table 2 shows the results of the relative frequency distribution that confirmed all observations in the classification that had been utilized. This, in turn, confirmed that all units had been distributed between the two groups, which implies that neither of the observations had been marginalized. The results also confirmed that the distribution of the units between the two groups had been, to great extent, balanced.

The current study conducted a test of significance differences between the two groups with respect to the three clustering variables using a one-way analysis of variance. Table 3 shows the results of this test.

Table (3): Results of the test of significance between the two groups of the study

Cluster variable	Group	Mean	Standard deviation	95% Mean Confidence Interval		Calculated F df:(1 – 840)	P - value
				Lower	upper		
C1:Loan amount	1st	9672	14.673	9182	10079	176.48	0.00
	2nd	14357	13.427	23895	15193		
C2: Rep. period	1st	5.28	1.041	4.89	6.12	153.26	0.00
	2nd	8.01	0.977	7.92	8.14		
C3: nat. labor	1st	3	11.736	1	5	12.83	0.646
	2nd	5	14.918	3	7		

Table 3 clearly shows that there are significant differences between the groups of the study for the first (C1) and second (C2) clustering variables as confirmed by the p–values. It is also found that the distinguishing feature of the first group was the lowest in terms of the loan amount and the shortest in terms of the period of the repayment of the loan. And quite the opposite in the second group, where the values confirmed that the second group was the highest in terms of the amount of the loan, and the longest in terms of the loan repayment period. The characteristics of each group of the study can then be summarized in Table 4.

Table (4): Characteristics of the groups of the study

The group	The characteristics
First	The least risk (non – faltering small Industrial business)
Second	The most risk (faltering small industrial Business)

4.2. Cox model result analysis

The current approach aims to use Cox step-wise model considering its ability to reduce the number of the independent variables, choosing the most effective one, and treating multi-collinearity problem more efficiently. It uses SPSS for the statistical analysis, to determine the set of independent variables that affect more on the faltering of small industrial enterprises. The following are the variables:

- X2: The expenses of establishment (SR 000).
- X5: Workers' wages (SR 000).
- X6: The cost of products marketing (SR 000).

Table (5): Results of the Application of Cox Step – wise Regression Model

Variable	Estimated parameter	Confidence interval		Standard error (SE)	Wald test	Likelihood ratio	χ^2 test	Sig
		Lower	Upper					
X_2	(0.046)[a]			0.026	138.17			
	(0.693)[b]	0.643	0.699					
X_5	(0.175)			0.051	14.87	5871.59	281.64	p-value=0.00
	(1.025)	0.989	1.o68					
X_6	-(0.864)			0.067	6.15			
	-(0.117)	-0.179	-0.197					

Table 5 shows the Cox model outputs.

a. estimated parameters of the logarithmic model.

b. estimated parameters of the exponential model.

- According to the Wald test, the establishment cost variable (X_2) is the most significant and influential independent variable that affects faltering or non – faltering of small industrial business, followed by the variable (X_5), workers' wages, and finally the variable (X_6), marketing of products cost, as it is known that the greater the Wald value, the more significant is the independent variable.
- Based on the signs of the estimated model parameters, we found that the estimated parameters of (X_2) and (X_5) were positive. This means that the exposure rate of the small industrial business to faltering is very high, as a positive parameter indicates a worse future for the enterprise. On the other hand, the sign of the variable (X_6) was found to be negative, which means that the exposure rate of the business to faltering is very low, since a negative parameter indicates a better future.

- (iii) As for the confidence intervals of the estimated parameters of the model, it is found that variable (X_2) had the narrowest interval followed by variable (X_5) and finally variable (X_6) respectively. This is confirmed by Wald test previously referred to in point (i) above.
- (iv) The likelihood ratio value, the chi – square value, and the p – value all of them confirm the model's significance.

Thus, Cox's relative risk function model takes the logarithmic form:

$$\mathbf{Ln\frac{hi(t)}{h0(t)} = 0.046\,X_2 + 0.175\,X_5 - 0.864\,X_6} \quad \textbf{(6)}$$

or takes the exponential form:

$$\mathbf{\frac{hi(t)}{h0(t)} = \exp(0.963\,X_2 + 1.025\,X_5 - 0.117\,X_6} \quad \textbf{(7)}$$

Using Kaplan – Meier function (KMF), the researchers found the distribution of observation for the small industrial business in terms of time according to the degree of risk faced by the enterprise. Kaplan – Meier function (estimator), also known as the product limit estimator, is a nonparametric statistic used to estimate the survival function from lifetime data. The estimator of the survival, S (t), (the probability that life is longer than t) is given by:

$$\widehat{S}(t) = \prod_{i=t_{i\le t}} \left(1 - \frac{d_i}{n_i}\right) \quad \textbf{(8)}$$

Where:

t_i: a time when at least one event happened.

d_i: the number of events (eg., faltering) that happened at time t_i.

n_i: the individuals known to have survived (have not yet had an event or been censored up to time t_i.).

Table (6): The Distribution of Observations for the Small Industrial Businesses in Terms of Time According to the Degree of Risk

Time	Number of Cases		Business Survival Rate	Standard Error (SE)
	Less Risk	High Risk		
2	7	42	0.958	0.004
3	6	58	0.933	0.005
3.5	-	6	0.907	0.005
4	13	62	0.864	0.009
4.5	4	5	0.851	0.010
5	15	112	0.772	0.013
5.5	-	5	0.769	0.013
6	17	93	0.716	0.014
6.5	3	7	0.694	0.014
7	21	74	0.682	0.014
7.5	6	4	0.654	0.014
8	35	58	0.639	0.014
8.5	12	6	0.605	0.015
9	56	61	0.575	0.015
9.5	15	-	0.541	0.016
10	47	44	0.528	0.016
10.5	14	-	0.503	0.016
11	88	23	0.496	0.017
11.5	2	-	0.487	0.017
12	60	14	0.481	0.017
12.5	14	-	0.476	0.018
13	41	2	0.454	0.018
13.5	7	-	0.448	0.018
14	39	1	0.437	0.018
14.5	12	-	0.419	0.019
15	35	3	0.399	0.019
16	18	-	0.385	0.020
17	6	-	0.381	0.021

It is evident from Table 6 that the highest degrees of risk to which the small industrial enterprise is exposed in general was in the fifth, sixth, and seventh years, and that if the business continues after that, this means its continuity, and less severity of the risk.

Table (7): Statistical Description of the Lifetime Characteristics of the Small Industrial Business

Mean	Median	Standard deviation	Mean Confidence Interval	
			Lower limit	Upper limit
8.759	8.000	0.218	8.516	9.172

Table 7 shows that the average lifetime of a small industrial business ranges between eight and nine years, and then the owner of the enterprise after the ninth year must take a decision to update, develop, amend or liquidate the business, or reconsider the application of some new advertising, marketing or pricing policies, or add a new production line.

5. Conclusion

Small industrial business has a crucial role in contributing to a nation's economy. The nation's economy relatively depends on the small industrial business performance and the performance varies according to the behavior of certain set of variables (Beaver, G., 2003). This study aims to recognize a set of variables that have the paramount impact on the performance of small industrial business. Remarkably, the study's analysis the performance of these variables using Cox model and obtained the following results:

- The results revealed that the variables most influencing the survival or failure of small industrial business are, the establishment expenses, workers' wages, and products marketing cost.
- The maximum degree of risk to which small industrial business were exposed lied in the fifth, sixth, and seventh years of its lifetime. If the business continued after these years, it means that the degree of the risk for such business will minimize in the remaining period of its lifetime. In other words, we found that the small industrial enterprise was exposed to a high degree of risk during the fifth, sixth, and seventh years of its lifetime. After these crucial years, the degree of risk varies and decreases significantly (Everett., et.al., 1998).
- Finally, the average lifetime of a small industrial business was found to be from eight to nine years.
- Based on the study's findings, future studies and the stakeholders should consider the following recommendations: (i) The variables such as, expenses of establishment, workers' wages and cost of marketing product should be taken into consideration when a decision about the faltering of a small industrial business is to be made. (ii) policy 2 needs to be taken into consideration after the ninth year of the lifetime of the enterprise such as, business update, development, modification, liquidation, reconsideration of some advertising, marketing or pricing policies, or the addition of a new production line. (iii) The establishment of a mechanism by the owners, e.g., administrative body that monitors small industrial business by providing technical and marketing, consultations, especially in the period starting from the fifth year of the business's lifetime, and (iv) adopt the approaches that ease regulations and laws for small industrial business.

Acknowledgement:

The study's authors extend their appreciation to the Deanship of Scientific Research at King Khalid University of Kingdom of Saudi Arabia for funding this work through the General Research Project under Grant number GRP/228/1440.

References

1. AFFIFI A., V.A. CLARK and S. MAY (2004). *Computer-Aided Multivariate*. Chapman & Hall/CRC-press.
2. AGRESTI A. (2012). *Categorical Data Analysis, 3rd Ed*. John Wiley & Sons.
3. ALTMAN D.G. (2020). *Partial Statistics for Medical Research, 2nd Ed*. Chapman & Hall.
4. ATAMAIN, R. and VAN ZANLE, N.R., (2010). Continuing education: a vital ingredient of the success plan for business. *Journal of Business and Economics Research*, 8(3), 37-42.
5. AUSTIN P.C., D.S. LEE & J.P. FINE (2016). Introduction to the analysis of survival data in the presence of competing risks, http://doi.org/10.1161/CIRCULARATINAHA.115.017719.
6. BEAVER, G., (2003). Small business success and failure. *Strategic Change*, 12(3), 15-22.
7. BRESLOW N.E. (1992). *Introduction to Kaplan & Meier (1958) Nonparametric Estimation from Incomplete Observations*. In: Kotz S., Johnson N.L. (Eds) Breakthroughs in Statistics. Springer.
8. BROWN, R., (2009). Keeping control of your credit. *Motor Transportation*, (8).
9. CHITTITHAWORN C., M.A. ISLAM, T. KEAWCHANA and D.H.M. YUSUT. (2011). Factors affecting business success of Small & Medium Enterprises (SMEs) in Tiland. *Asian Journal of Social Science*, 7(5), 180 – 190. https://doi.org/10.5539/ass.v7n5p180
10. COLLETT, D. (2015). *Modelling Survival Data in Medical Research, 3rd ed*. Chapman & Hall, London.
11. COX, D. R. (1972). Regression models and life tables with discussion. Journal of Royal Statistics Society, B :(34):187 – 220.
12. COX, D. R. & SNELL, E. J. (2016). *The Analysis of Binary Data, online*. Cambridge University Press.
13. DECISION INNOVATION. (2020). *Problem Solving, Decision Making*. http://www.decision-makingsolutions.com/problem_solving_decision_making.html
14. EVERETT, J. & WATSON, J., (1998). Small business failures and external risk factors. *Small Business Economics*, 11(4), 371-90.
15. GARBONE, T., (1981). Four common failures and how to avoid them. *Management World*, 10(8), 38-39.
16. JOHNSON, R. A. & D. W. WICHERN (2007). *Applied Multivariate Statistical Analysis*. 6th ed., Pearson Prentice Hall, N.J.

17. NELTON, S., (1992). Ten key threats to success. *Nation's Business*, 8(6), 18-24

18. PUNJ G. and D.W. STEWART (1983). Cluster analysis in marketing research: review and suggestions for applications. *Journal of Marketing Research*, 20(2), 134. https://doi.org/10.2307/3151680

19. SHARMA, S. (1995). *Applied Multivariate Techniques*. John Wiley & Sons.

20. STECK, R.N., (1985). Why new business fail. *Dun and Brad Street Report*, 33(6), 34-38.

21. TERRY, M. T. & P. M. GRAMBSCH (2000). *Modelling Survival Data: Extending Cox Model*. Springer- Verlag.

22. UPTON, H., (1992). Management mistakes in a new business. *National Petroleum News*, 84(10), 50.

رفـــاد REFAAD
www.refaad.com

المجلة العالمية للاقتصاد والأعمال
Global Journal of Economics and Business (GJEB)
Journal Homepage: https://www.refaad.com/Journal/Index/2
E-ISSN 2519-9293 | P-ISSN 2519-9285

عوامل النجاح والفشل في الأعمال الصناعية الصغيرة: حالة منطقة عسير في المملكة العربية السعودية

فؤاد سعيد سعد [1] ، محمد أبو القاسم حسنين [2] ، فتح الرحمن شاء الدين [3] ، حمود محمد العمر [4]
[4,3,2,1] كلية الأعمال- جامعة الملك خالد- المملكة العربية السعودية
[1] fusaad@kku.edu.sa

DOI: https://doi.org/10.31559/GJEB2022.12.1.8 **قبول البحث:** 2022/1/6 **مراجعة البحث:** 2021/12/26 **استلام البحث:** 2021/12/12

الملخص:

لدى العوامل المرتبطة بالأعمال الصناعية الصغيرة تأثير كبير على أدائها ويجب تحديدها مع الأخذ في الاعتبار مساهمتها في أداء الأعمال. تهدف هذه الدراسة إلى التعرف على مجموعة من المتغيرات التي لها تأثير كبير على أداء الأعمال الصناعية الصغيرة. كما أنها تبني نموذجًا إحصائيًا يستخدم لتقدير احتمالية التعثر لأي مؤسسة صناعية صغيرة ولتحديد وقت بقائها المتوقع. يطبق التحليل العنقودي للتصنيف اعتمادًا على المتغيرات، أي المتعثرة وغير المتعثرة باستخدام نموذج الانحدار الخاص بكوكس. وبشكل لا يصدق، تظهر النتائج التي تم الحصول عليها أن (1) المتغيرات الأكثر تأثيرًا التي تؤثر على نجاح أو فشل الأعمال الصناعية الصغيرة هي: مصاريف التأسيس ، وأجور العمال، وتكلفة تسويق المنتجات، (2) أقصى درجة من المخاطر على الصناعات الصغيرة. كان العمل خلال السنوات الخامسة والسادسة والسابعة، وتراوح متوسط عمر مؤسسة صناعية صغيرة من 8 إلى 9 سنوات. تشير النتائج إلى أنه يجب على الأطراف الفاعلة مراعاة المتغيرات المتعثرة عند اتخاذ قرارات العمل والنظر في تنفيذ السياسات بعد السنة التاسعة من اعتماد المتغيرات.

الكلمات المفتاحية: تحليل الكتلة؛ نموذج انحدار كوكس؛ الترنح؛ الأعمال الصناعية الصغيرة.