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Title: Factors affecting the success or failure of small and medium enterprises in Puerto Rico

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Abstract

The present study aims to research the success or failure factors of SMEs in Puerto Rico using firm and owner characteristics and the economic timing presented in Lussier model developed in the USA in 1995. The model considers 15 key factors in the success or failure of SMEs, (Lussier, 1995). The success rate was measured upon comparing the performance of the firm in the past three years with the average in the industry. The results proved the model can actually classify firms as either successful or failure 77.3% on average. The most significant variables of the model related to the owner characteristics were ethnic origin (minority); and two characteristics of the firm were staffing and product/service timing. This study adds the sixth country used in the Lussier model to predict success or failure in another region of the world testing their ability to predict and classify the companies in the respective groups of success or failure.

Keywords: success/failure model, SME's, Puerto Rico, Lussier Model, small business firm performance, success/failure factors

Background literature

The importance of SME around the globe is well documented due to its relation with employment and economic growth, (OECD, 2013). For example, in 2012 in the European Union (EU) there were about 20.7 million of small and medium-sized businesses (SMEs), accounting for 99.8% of the total number of enterprises, (EU, 2012). In the United States (USA) 28.4 million of SMEs represent 99.7% of total

businesses and employ 56 million of private-sector workforce (SBA, 2015). Although its contribution is obvious there is no consensus on the factors that lead a company to be successful or avoid failure. The business performance has been largely studied by scholars using different variables.

The present study aims to research the success or failure of SMES in Puerto Rico using firm and owner characteristics and the economic timing presented in the Lussier model developed in the USA in 1995 and comparing the results with those countries that previously used the model. The model considers 15 key factors in the success or failure of SMEs, (Lussier, 1995). The model has been tested in five countries, USA, Singapore, Chile, Croatia, and Israel, and has demonstrated its ability to predict success or failure in SMEs, (Lussier, 1995; Teng et al., 2011; Lussier and Halabi, 2010; Lussier and Pfeifer, 2001; Marom and Lussier, 2014). In order to generate a consensus researchers have begun to test it in other parts of the world.

Previous studies on success in other countries, are for example, Mexico (Velarde, Araiza & Garcia, 2013), Indonesia (Inadarti & Langenberg, 2004), Malaysia (Munikrishnan & Veerakumaran, 2012; Rose et al., 2006), Bangladesh (Philip, 2011; Islam et al., 2011), Thailand (Chittithaworn et al., 2011), Australia (Walker & Brown, 2004); to name a few; on failure in, USA (Carter & Van Auken, 2006), Zimbabue (Carter & Wilton, 2006), Spain (Justo, 2007) and; on the success/failure prediction capabilities of Lussier work in Chile (Lussier & Halabi, 2010, 2008; Halabi & Lussier , 2010) and Israel (Marom and Lussier, 2014).

Recognizing the importance of SMEs in the economy has led many scholars to study the firm performance of these companies to determine the factors that lead them to success or failure. Nevertheless, there is no universal way to measure success, the most common measures have been the participation in the market, the sales volume and the prestige or image of the company (Foley & Green, quoted in Chittithaworn et al., 2011). Luk (1996), on the other hand, indicates that these measures are appropriate for large companies, but not for SME's.

According to data from the Small Business Administration (SBA) 2014, the SME sector in Puerto Rico is composed of 44,631 registered establishments. These SMEs employ around 554,976 people, which represent 80.4% of the country's labor force. The importance of SMEs in the context of Puerto Rico prompts one to investigate the factors that lead to the success or failure, since that allows to provide guidance on specific topics to the deploying public policy (Lussier & Pfeifer, 2001; Lussier &

Halabi, 2010) and because it has broad global applications of the Lussier model, as suggested by the researchers of this subject.

The research objectives are the following: To examine the factors associated with firm and owner characteristics and the economic cycle that are related to the success or failure of SMEs, using the variables of Lussier model in order to evaluate this model with the data of Puerto Rico; identify the variables that most impact the success or failure between the owners of SMEs, to determine the predictive power of the model, to determine the most significant factors related to success or failure; and to compare the results of classification of the model with that of other countries.

The questions for this research are as follows: First, what is the estimated value of Lussier model for Puerto Rico's data? Second, is the Lussier predictor model capable of predicting success or failure in the SME sector in Puerto Rico? Third, what are the most significant factors related to success or failure? And fourth, what is Puerto Rico classification model rate in comparison with other countries?

Methodology

This study can be regarded as exploratory study since the focus is on identification of success and failure factors of Puerto Rican SMEs. The questionnaire was the instrument of the study. The questionnaire consisted of three parts, the variables of the model, the actual situation of SME and demographic information of SMEs. For this study, the Lussier model which has been used in the USA, Croatia, Chile, Singapore and Israel was selected.

The fifteen independent variables were grouped into three categories, according to the research on success or failure (Indarti & Langenberg, 2004; Justo, 2007; Munikrishnan & Veerakumaran, 2012): (1) the characteristics of the owner, (2) the characteristics of the SME and (3) the economic cycle in the success or failure of the company. First, the characteristics of the owner included were age, parents, education, ethnic origin, managerial and industrial experience and marketing. Second, the firm characteristics considered were, capital, record keeping and financial control, staffing, product/service timing, planning, professional advisors and partners. And third, the economic timing ranges from expansion to recession when businesses start operations. The perception of the owner on the level of net profit of the industrial sector to which the respondents belong was used as a measure of the dependent variable.

The survey used was developed from the integration and adaptation of the questionnaires used in Lussier and Pfeifer (2001), Halabi and Lussier (2010) and Teng

et al., (2011). The questionnaire consists of 35 questions. Different types of scales were used including seven-point Likert anchored by totally agree to totally disagree to measure the perceived success or failure of SME. Table 1 in appendix A summarizes the independent variables of the model.

In order to answer the first question of the investigation, regarding the estimate of the Lussier model with Puerto Rico data, a logistic regression model was used. Second, to answer question number two of the research, regarding the ability of the Lussier model to predict success or failure, the values obtained by the SME participants in the equation were added in order to corroborate how well the model classifies them as success or failure. Third, to determine the most significant factors the values of the variables were compared. And fourth, the results were compared for the classification of the model with those of other countries.

The numbers of respondents were 558. In the study, the sample is composed of SMEs with operations in Puerto Rico, companies with 500 or fewer employees (SBA, 2014). A non-probabilistic sample was used for convenience in compliance with the characteristics of the research, (Hernandez Sampieri et al., 2010). This study considers the member of the United Retailers Association of Puerto Rico. Of the total 558 responses, 388 were discarded due to an incomplete questionnaire, leaving 170 questionnaires useful.

The response to question 20 was used to group the data in accordance with the dependent variable, profitability. The response was measured using a Likert scale of 7 points; those with answer number 4 were removed from the sample since they do not represent neither success nor failure, (Lussier & Halabi, 2010; Lussier & Pfeifer, 2001). The 38 companies that answer 4 in that question were eliminated. The final survey sample was 132 companies, 40 classified as successful and 92 as a failure.

Results and implications

The purpose of the study was to identify the factors affecting the business success or failure of SMEs in Puerto Rico. The model equation for Puerto Rico (Q1) is as follows: $Y = -2.730 - 0.232\beta1 - 0.707\beta2 + 0.248\beta3 – 1.133\beta4 – 0.010\beta5 – 0.005\beta6 + 0.002\beta7 – 0.022\beta8 + 0.160\beta9 +0.288\beta10 + 0.256\beta11 – 0.050\beta12 + 0.115\beta13 + 0.224\beta14 – 0.029\beta15$. The results of the logistic regression model are shown in table 2 in appendix B. If local companies take into consideration, at the time of starting a business, the variables in the model previously mentioned in the table 1, the chances are increasing of being a successful business than those that did not take them into account.

This study adds the sixth country used in the Lussier model to predict success or failure in another region of the world testing their ability to predict and classify the companies in the respective groups of success or failure.

To answer the question 2 (Q2) on the model's ability to predict success or failure, the results showed that the model can predict successfully that a company is correctly classified in a 77.3 %. To answer the question three (Q3) the most significant variables of the model related to the owner characteristics were, ethnic origin (minority), and two characteristics of the firm were staffing and product/service timing. To answer the question fourth (Q4) of the research on the comparison of the predictive capacity of the model in other countries where it has been used (USA, Croatia, Chile, Singapore and Israel), the model has demonstrated its ability to predict success or failure in SMEs, 69.16 %, 72.32 %, 63.2 %, 85.62% and 85.4%, respectively, table 3 appendix C. In general, the model of Puerto Rico was able to classify 77.3 % of the companies which means that it turned out to be better than the USA, Croatia and Chile, but lower than that of Singapore and Israel.

First, for international business area, this study contributes to obtain information from SMEs in Puerto Rico. Second, the public and private sector will have a frame of reference for those elements that can influence the success or failure of a business in Puerto Rico in an open economy. Third, for the academy, this research contributes with quantitative empirical data on those determinants that influence the success or failure of SMEs. Fourth, for the business class, it provides information about the factors that influence the process to successfully operate a business and counterbalance the failure. Fifth, for public policy, it provides validated information on some of the variables that should be considered at the time to make changes that can be of benefit to entrepreneurs in the country. Sixth, the study findings contribute and allow future lines of study to researchers and experts of the topic.

In terms of SMEs at the global level, in spite of cultural differences in the countries where the model has been tested, apparently, the world moves toward a similarity between the factors that are important and serve to predict the success or failure of the companies. In addition it extends this work to other countries.

REFERENCES

Carter, R., & Van Auken, H. (2006). Small firm bankruptcy. *Journal of Small Business Management, 44*, 493-512.

Carter, S. & Wilton, W. (2006). Don't blame the entrepreneur, blame government: The centrality of the government in enterprise development; Lessons from enterprise failure in Zimbabwe. *Journal of Enterprising Culture, 14(1)*, 65-84.

Chittithaworn, C., Islam, *M. A., Keawchana, T., & Yusuf, D.H. (2011).* Factors affecting business success of small & medium enterprises (SMEs) in Thailand. *Asian Social Science, 7*(5), 180-190.

Halabí, C., & Lussier, R. N. (2010). *A model for predicting small firm performance: Increasing the probability of entreneurial success*. Documentos de Trabajo 03, Universidad Diego Portales, Chile. Recovered from http://www.udp.cl

Hernández Sampieri, R., Fernández Collado, C., & Baptista Lucio, P. (2010). *Metodología de la investigación.* México: McGraw-Hill.

Indarti, N., & Langenberg, M. (2004). *Factors affecting business success among SMEs: Empirical evidences from Indonesia*. Paper presented en laThe second bi-annual European Summer University 2004, University of Twente, Enschede, The Netherlands, September, 19-21(pp. 1-15).University of Twente: Enschede, The Netherlands.

Islam, M., Kahn, M., Obaidullah, A., & Alam, M. (2011). Effect of entrepreneur and firm Characteristics on the Business Success of Small and Medium Enterprises (SMEs) in Bangladesh. *International Journal of Business Management, 6*(3), 289-299.

Justo, R. (2007). La influencia del género en el fracaso empresarial: Una aplicación al caso de España. *Revista de Empresa, (20),* 52-64.

Luk, S. (1996). Success in Hong Kong: Factors self-reported by successful small business owners. *Journal of Small Business Management, 34*(3), 68-74.

Lussier, R. N. (1995). A nonfinancial business success versus failure prediction model for young firms. *Journal of Small Business Management, 33(1),* 8-20.

Lussier, R.N., & Halabi, C.E. (2008). An analysis of small business in Chile: a correlational study. *Journal of Small Business and Enterprise Development, 15*(3), 490-503.

Lussier, R.N., & Halabi, C.E. (2010). A three-country comparison of the business success versus failure prediction model. *Journal of Small Business Management, 48*(3), 360-377.

Lussier, R.N., & Pfeifer, S. (2000). A comparison of business success versus failure variables between U.S. and Central Eastern Croatian entrepreneurs. *Entrepreneurship Theory and Practice, 24*(4), 59-67.

Lussier, R.N., & Pfeifer, S. (2001). A crossnational prediction model for business success. *Journal of Small Business Management, 39*(3), 228-239.

Marom, S. & Lussier, R.N. (2014). A business success versus failure prediction model for small businesses in Israel. *Business and Economic Research, 4*(2), 63-81.

Munikrishnan, U.T., & Veerakumaran, B. (2012). A survey on business success factors influencing budget hotels in Klang Valley. *Journal of Global Entreprenuership, 2(1), 31-35*.

Organisation for Economic Co-operation and Development. (2013). *OECD SME and entrepreneurship outlook*. Paris: Author. Recover April 9, 2015 from http://www.camaras.org/ publish/europe/pdf/8505011E.pdf

Philip, M. (2011). Factors affecting business success of small & medium enterprises. *Asian Pacific Journal of Research in Business Management, 1*(2), 118-136.

Rose, R., Kumar, N., & Yen, L. (2006). Entrepreneurs success factors and escalation of small and medium-sized enterprises in Malaysia. *Journal of Social Sciences, 2*(3), 74-80. doi: 10.3844/jssp.2006.74.80.

Teng, H. S. S., Bhatia, G. S., & Anwar, S. (2011). A sucess versus failure prediction model for small business in Singapore. *American Journal of Business, 26*(1), 50-61.

U.S. Small Business Administration, Office of Advocacy. (2015, 2014). U.S. territories. *Small business profile*. Recovered from de http://www.sba.gov

Velarde, E., Araiza, Z. & García, A. (2013). Factores de la empresa y del empresario y su relación con el éxito económico en las pymes de la región centro de Coahuila, en México. *Global Conference on Business and Finance Proceedings, 8*(2), 1648-1652.

Walker, E., & Brown, A. (2004). What success factors are important to small business owners. *International Small Business Journal, 22*(6), 577-594. doi: 10.1177/ 0266242604047411

Appendix A

Table 1

Independent variables of the model (abbreviated) that predict success or failure.

Entrepreneurial characterics	
Age (age)	Young people who start a business have a higher probability of failure than older people.
Parents (Pent)	Business owners whose parents did not have a business have higher probability of failure than those whose parents were owners of a business.
Educaction (edu)	People without higher or university education that start a business have a higher probability of failure that people with one year or more of university education.
Minority or Ethnic Origin (mior)(eo)	Minorities have a higher probability of failure in comparison with those that are not part of them.
Previous experience [management (maex) or industrial (inex)]	Previous experience [management (maex) or industrial (inex)] Business people without prior experience in management, have a higher probability of failure that those that are handled by people with previous experience in management. On the other hand, businesses managed by people without prior experience in the industry, have a higher probability of failure that firms run by people with previous experience in the industry.
Marketing (mrkt)	Marketing (mrkt) The owners of the business that do not have skills in marketing, have higher probability of failure that owners who have skills in marketing.
Characteristics of the SMEs	
Capital (capt)	New businesses without the necessary capital or undercapitalized have a higher probability of failure than those starting with an adequate capital.
Record keeping and financial control (rkfc)	Businesses that do not maintain the documents or records or accounts updated and correct and that do not use adequate financial controls have a higher probability of failure than those firms that do.
Staffing (staff)	Business that cannot attract and retain quality staff are more likely to failure than businesses that do. .
Product/service timing (psti)	Businesses that selected the products/services that are too new or too old, have a higher probability of failure than those that selected products/services that are in the stage of growth. .
Planning (plan)	Businesses that do not develop a specific business plan have a greater chance of failure than those that do it.
Professional advisors (prad)	Businesses that do not use professional advisers or consultants have a greater chance of failure than those companies that do. A more recent source of professional consultants are the venture capital investors.
Partners (part)	A business started by a single person has a greater chance of failure than those started by more than one person.
Environment of the company	
Economic timing (ecti)	Businesses that begin during a recession are more likely to failure than those begin during periods of expansion.

Translated and adapted from Lussier y Halabi (2010).

Appendix B

Table 2

Logistics regression model test results Puerto Rico, (n=132; S=40, F=92).

Variables	B	Significance
Age	-0.232	0.161
Parents	-0.707	0.131
Education	0.248	1.282
Minority or Ethnic Origin	-1.133	**0.044**
Management experience	-0.010	0.763
Industrial experience	-0.005	0.881
Marketing	0.002	0.988
Capital	-0.022	0.901
Record keeping and financial control	0.160	0.180
Staffing	0.288	**0.036**
Product/service timing	0.256	**0.027**
Planning	-0.050	0.742
Professional advisors	0.115	0.435
Partners	0.224	0.669
Economic timing	-0.029	0.793
Constant	-2.730	0.042
Model Results		
-2 log likelihood	132.513	
Model Chi-square	29.427	
Model Significance	0.014	
R^2 Cox & Snell	0.200	
Nagelkerke	0.283	
Classifications Results		
Correct Classification		
Success	40.0	
Failure	93.5	
Total	77.3	

Appendix C

Table 3 Results Comparison for question 4

Country	Classification	Variables*
PR	77.30	mior/staff/psti
USA	69.16	staff/edu/plan/prad
Croatia	72.32	staff
Chile	63.20	none
Singapore	85.62	psti
Israel	85.40	capt,rkfc,plan, prad, age

*Abbreviation according to table 1