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WALDIR SABOIA BEZERRA

WHY IT IS IMPORTANT FOR BRAZILIAN MSMES TO PARTICIPATE IN QUALITY AWARDS

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Thesis Advisor: Dr. Jésus de Lisboa Gomes

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WHY IT IS IMPORTANT FOR BRAZILIAN MSMES TO PARTICIPATE IN QUALITY AWARDS

Artigo apresentado ao Centro Universitário Álvares Penteado, como requisito para a obtenção do título de Mestre em Administração.

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Dedicatória

Dedico este estudo a todos os professores do Mestrado Profissional em Administração da FECAP que, em maior ou menor grau, incentivaram-me a continuar em frente.

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Resumo

Bezerra, W. S. (2019). Porque é importante para as micro, pequenas e médias empresas participarem de prêmios de qualidade (Dissertação de Mestrado). Centro Universitário Álvares Penteado, Fundação Escola de Comércio Álvares Penteado – FECAP, São Paulo, SP, Brasil.

As Micro, Pequenas e Médias Empresas (MPME) têm uma posição muito importante nas economias de muitos países, especialmente naqueles países considerados em desenvolvimento. Proporcionar acesso a essas empresas para as melhores práticas de gestão e qualidade pode ser a maneira mais fácil e melhor para acelerar as economias onde as MPMEs têm uma forte presença. Uma forma simples de fornecer acesso às melhores práticas é reunir essas empresas e retornar a elas uma avaliação que mostre qual grau de maturidade cada empresa está comparando com seu mercado e seus concorrentes locais. A maneira de fazer isso é incentivar essas empresas a participarem do processo de premiação da qualidade local, onde terão uma visão geral de suas empresas com base nas auto-avaliações feitas sobre os dados informados quando da solicitação de participação no prêmio.

Palavras-chave: Pequenas empresas. Microempresas. Prêmio de qualidade. Gerenciamento. Desempenho financeiro.

Abstract

Bezerra, W. S. (2019). Why it is important for the Brazilian MSMEs to participate in quality awards (Dissertação de Mestrado). Centro Universitário Álvares Penteado, Fundação Escola de Comércio Álvares Penteado – FECAP, São Paulo, SP, Brasil.

The Micro, Small and Medium Enterprises (MSMEs) have a significant position in the economies of many countries, especially in those countries considered to be in development. The most efficient way to boost the economies where MSMEs have a strong presence is providing access for these companies, or firms, to the best practices in management and quality. A simple manner in which to accomplish this is to return an assessment to each MSME, which displays the company's grade of maturity compared to its market and local competitors. These assessments can be produced by inviting these companies to participate in local quality awards. Prior to arrival, the firms complete applications to participate in the award, detailing company data for the award organizations, from which self-assessments can be created with a general overview of their institutions.

Key-words: Small business. Micro enterprises. Quality award. Management. Financial performance.

1 Introduction

Small and medium sized firms represent a large portion of the Brazilian economy. This is indicative of the important role they play in most economies, but particularly in those of developing countries.

According to the World Bank in 2018, formal Small and Medium Enterprises (SMEs - companies that have the government permission to operate in the country - contribute up to 60% of total employment and up to 40% of national income (GDP) in emerging economies. Adding informal SMEs - companies that operate without government permission - will increase the number. The World Bank estimates that almost 600 million jobs will be needed in the next 15 years to absorb the growing global workforce, mainly in Asia and Sub-Saharan Africa. In the emerging markets, including Brazil, most of traditional jobs are generated by SMEs, which create four out of five new positions.

The World Bank's study suggests that there are between 365 and 445 million Micro, Small and Medium Enterprises (MSMEs) in emerging markets. Of these, 25 to 30 million are formal SMEs, 55 to 70 million are formal microenterprises, and 285 to 345 million are informal enterprises. Moving informal companies into the formal sector can have considerable advantages for the MSMEs, including improved access to credit services, government services, and the overall economy.

In Brazil, due to the low performance of the economy and the high level of unemployment registered in the last years, many people are starting small companies as an alternative to continue earning money.

Historically, the number of new SMEs has been more significant in periods of crisis. However, now there are new discussions related to social security and the *Fundo de Garantia por Tempo de Serviço (FGTS)*, which is a kind of compulsory loan paid to the Brazilian govern. Many people prefer to keep their money and apply it to their business, rather than allow part of their income as an employee to be sent to the Brazilian govern. The reason is that the Brazilian govern is reviewing the rules for retirement and leaving all people that have an employ preoccupied.

Other countries are also studying social security arrangements and early-stage entrepreneurial activity due to their impact in the workforce, government policies, and the development of SMEs (Hessels et al., 2006).

According to *Serviço Brasileiro de Apoio às Micro e Pequenas Empresas* (Brazilian Service to Support Micro and Small Enterprises), also known as SEBRAE, in 2011 the SMEs

were responsible for 27% of the GDP and 53.4% of the employment in the retail market segment. In the industry segment, micro and small enterprises had 22.5% of the share, very near to medium enterprises at 24.5% (SEBRAE, 2014). In 2015, the total amount of MSMEs in Brazil was around 9.5 million companies, which represented 99% of all formal enterprises in Brazil at that time (SEBRAE).

The management process is another critical point for MSMEs. Since owners are often responsible for keeping the firm operating and adopting new management methods, improving the quality of administration poses a difficult problem. How can they learn and apply the best practices without wasting too much time? Participating in programs like the *Total Quality Management* provides an alternative for owners to learn rapidly about the best management practices, especially since a few of these awards administer a self-assessment based on a survey answered by the participants. There are excellent examples of this kind of award around the globe.

In Japan, there is the Deming Prize (JUSE, 2018). This award is in honor of Dr. William Edwards Deming who was a U.S. Citizen and in 1950 went to Japan to teach quality management. The primary objective was to promote the best practices that could help companies improve their management in quality and other business areas. It is important to mention that the Deming Prize was the first award that had the intention to improve the Japanese industry. Due to the success of the Deming Prize in Japan and the increased quality of Japanese products, the U.S. Government decided to create a similar program.

In response to Japan's accomplishments, the USA created the Malcolm Baldrige National Quality Award (MBNQA, 2018), established by the U.S. Congress in 1987. The award raises awareness of quality management and recognizes U.S. companies that have implemented successful quality management systems. This award has six categories: manufacturing, service, small business, education, healthcare, and nonprofit.

From the companies who have received the Baldrige Award, nearly all of them have used the feedback from their Baldrige assessments to build on their strengths and address their areas for development. In fact, as part of applying for the Baldrige Award, an applicant receives a feedback report from a team of trained examiners, which outlines the organization's skills and opportunities for improvement from the team's perspective (Schaefer, 2011).

The Baldrige Award is given to only a few of the applicants because they meet the highest standards. However, in a sense, every organization that uses the Baldrige Criteria for self-study and change can become a winner due to their increased ability to learn, adapt, innovate, and achieve excellence. From 2000 to 2011, twelve small businesses have received

the Baldrige Award. The following are just a few of the many positive results coming from the small business companies that applied the recommendations of the Baldrige Award (Schaefer, 2011):

a) At Mesa Products, Inc., there was a 93% sales increase over six years;
b) at Midway USA, there was a 25% sales growth in one year, compared to 10% for its competitor, as well as a 300% increase in net income as a percentage of sales over five years;
c) at Park Place Lexus, there was a 51% increase in gross profit percentage over four years, a 30% increase in new and pre-owned cars sold over four years, and an 11% growth in share of the luxury car market at the Plano dealership over three years.

The European Foundation for Quality Management, or EFQM (2018), was founded in October 1989 when the CEOs and Presidents of 67 European companies subscribed to the Policy Document and declared their commitment to achieving EFQM's mission and vision. The Foundation selected a team of experts, from industry and academia, to develop the EFQM Excellence Model, a holistic framework that could be applied to any organization, regardless of size or sector. It was first used to support the assessment of organizations for the European Quality Award in 1992.

In Brazil, the *Prêmio de Competitividade para Micros e Pequenas Empresas* (Competitive Award for the Micro and Small Enterprises), or MPE Brazil, was created as a way to recognize, at both the state and national levels, the micro and small enterprises promoting the quality of growth, productivity, and competitiveness, by the dissemination of concepts and practices of management. The MPE Brazil was first implemented in the state of Paraná in 2004 with the original name *Prêmio Sucesso Empresarial* (Enterprise Success Award). In 2008, *Prêmio Sucesso Empresarial* was launched nationwide, coordinated by SEBRAE, and it adopted its current name, *Prêmio de Competitividade para Micro, Pequenas e Médias Empresas,* or simply MPE Brazil. As a way to encourage participation, each company that decides to participate in the award receives an evaluation regarding the situation of their company based on their answers informed in a free self-assessment questionnaire. The software aims to encourage management improvement and the search for organizational excellence of MSMEs. The self-assessment, carried out in a virtual tool called *MPE Diagnóstico*, contains questions on the most diverse topics related to business management, such as mission and vision, customer service, work patterns, productivity, innovation, and sustainability. The questionnaire was structured in parts as follows:

a) Part I. Company's Management: It depicts the degree of mature management of the company, concerning the Model of Management Excellence, adapted to the reality of micro and small businesses in the form of strengths and opportunities for improvement.
b) Part II. Social Responsibility Practices: It highlights the strengths and opportunities for improvement in relationships with the environment, stakeholders, and community in which the company operates.
c) Part III. Innovation Practices: It informs the strengths and opportunities for improvement that make the organizational environment more conducive to the innovation of products, services, processes, and how to manage the company.

Because no specific research about the importance of MSME participation in quality awards that return self-assessment reports was found in Brazil, this paper addresses the gap.

The question of interest, then: why is it important for Brazilian MSMEs to participate in quality awards? The hypothesis is that a positive relationship exists between MSME performance and participation in these kinds of quality awards.

The following sections of this paper are related to the theoretical foundation, method, descriptive statistics, result analysis, and final considerations.

2 Theoretical Foundation

The Micro, Small and Medium Enterprises (MSMEs) have been considered very important for the development of economies, impacting all regions at a global level. Many of these firms are related to entrepreneurial organizations. According to Mintzberg (1992), the structures of these organizations are simple. There is not much more than one large unit consisting of one or a few top managers, one of whom dominates by the pull to lead, and a group of operators who do the basic work. Little of the behavior in the organization is formalized and minimal use is made of planning, training, or the liaison devices. There are few middle line managers because so much of the coordination is handled at the top. Even the support staff is minimized in order to keep the structure lean and the organization flexible. This is useful because it operates in a dynamic environment, often by choice since that is the only place where it can work around the bureaucracies. The organization is usually young, in part because time drives it toward bureaucracy, in part because the vulnerability of its simple structure often causes it to fail.

Baumol (1968) considers entrepreneurs the critical factor to stimulate economic growth and suggests that innovations require the entrepreneurial initiative to be introduced.

Furthermore, he writes that if we seek to explain the success of economies that have managed to grow significantly with those that have remained relatively stagnant, we find it difficult to do so without taking into consideration differences in the availability of entrepreneurial talent and in the motivational mechanism upon which they drive.

Schumpeter (1934) evaluates that an entrepreneur intrudes into this eventless world, seeking opportunities to stir things up. He or she seeks profit by exploiting situations that invite change. New products or new techniques for the production of goods and services previously available immediately come to mind as examples. However, the opportunities for what Schumpeter calls "new combinations" go well beyond these two. They include the adoption of new and better (or cheaper) sources of input supplies, the opening of new markets, and the introduction of more profitable forms of business organization (even for the sake of acquisition of monopoly power). Anything that was not done before and that contributes to profit is within the domain of the entrepreneur.

Schumpeter (1934) thus defines the entrepreneur as the innovator, and, in the process, carefully distinguishes the entrepreneur from either the inventor or the capitalist. Innovation is the act of putting a novel idea into operation—of bringing it from the drawing board into productive activity in the marketplace.

Beck, Demirgüç-Kunt and Maksimovic (2005) estimate the standard growth regression, including the relative size of the SME sector regarding employment, and find a positive but not robust impact of this sector on economic growth for a cross-section of countries. A similar approach is used with Audretsch and Keilbach (2004) and Muller (2007). Their findings suggest a positive impact of measures of entrepreneurship on economic growth in the context of developed countries.

The different impact that SMEs and entrepreneurship have on countries at different stages of development might be related to institutional limitations. Beck et al. (2005), suggest that financial constraints impede SMEs' development. Acs, Desai and Hessels (2008) have attributed these differences in empirical results to different entrepreneurship responses to institutions. Similarly, Baumol (1990) suggests that while the total supply of entrepreneurs differs across economies, the productive contribution of the society's entrepreneurial activities varies much more because of their allocation between productive and unproductive activities due to differences in the institutional quality. Thus, due to institutional differences, the presence of SMEs in a developing economy does not influence economic performance as in developed ones. Moreover, the SME sector in developing countries is dominated by labor-intensive and low-tech firms that are more likely to be related to necessity entrepreneurship.

When talking about SME, it should be noted that not all small business owners are entrepreneurs. Carland, Hoy, Boulton and Carland (1984) have established a typology of business owners by distinguishing between those with entrepreneurial orientation (EO) and firm performance from others small business owners having a small business orientation (SBO), suggesting that the two have different short and long-term goals. Runyan, Droge and Swinney (2008) state as one of their hypotheses that longevity of the companies would be one of the measurements of performance because many small businesses base their strategies not only in financial performance but also, in some respects, the owner's personality. A definition of small business owner, as outlined by Jenkins and Johnson, is an individual who establishes and manages a business to further personal goals and agendas (1997).

3 Method

Econometric methods are relevant in virtually every branch of applied economics. They come into play either when we have an economic theory to test or when we have a relationship in mind that has some importance for business decisions or policy analysis.

An empirical analysis by definition, requires data to test a theory or to estimate a relationship. After data on the relevant variables have been collected, econometric methods estimate the parameters in the econometric model and formally test hypotheses of interest. In some cases, the econometric model makes predictions in either the testing of a theory or the study of a policy's impact (Wooldridge, 2013).

Logistic regression is one of those econometric methods. It obtains the odds ratio in the presence of more than one explanatory variable. The procedure is quite similar to multiple linear regression, with the exception that the response variable is binomial. The result is the impact of each variable on the odds ratio of the observed event of interest. The main advantage is to avoid confounding effects by analyzing the association of all variables together (Everett &Watson, 1998).

The logistic model is expressed through the log of the odds of an event, as follows:

Logit (y) = ln (P / (1-P)) where:

P = the odds that a specific event (y) occurs.

For the purpose of this paper, the performance of MSMEs is the longevity of the companies.

The goal of this paper is to study the success of the Brazilian MSMEs that participated in a quality award. Logistic regression (Logit) will be used as the econometric model.

In order to achieve this goal, the first step was to access a database with the appropriate information. The intention was to utilize the same data collected on application forms by MPE Brazil and used by SEBRAE in evaluating the candidates for the award.

Based on the collected data, a quantitative analysis was completed, which tried to establish a correlation between performance and its determinants. A dummy variable was included in the database to evaluate and inform whether a company that already won the award is still active. Finally, the last task was to run a regression with the dummy Active as the dependent variable, while all other variables were control variables.

4 Descriptive Statistics

SEBRAE was solicited for a grant in order to access the database with information about the MPE Brazil participants from 2013 to 2016. The objective was to use the same collected data used in analyzing the companies.

It is important to mention that bias of selection may exist because all companies that decided to participate in the award had a chance to win, in principle.

The initial information from the original database showed that there were more than 60,000 entries—companies who decided to participate in the MPE Brazil—related to the period between 2013 and 2016. SEBRAE also granted access to another database with the winners of the MPE Brazil at the state and national level during the same period. In order to be more effective, it was built a new database based on the original one, but only with the data deemed important for the objectives of this research. This new database was built cross-checking entries with the winners, also both at the state and national level. The fields of this new database are listed in Appendix A.

About the Database:

Number of entries in the database by the size of the company

Table 1
Number of entries in the database by the size of the company

Micro	Small	Medium-Large	Entrepremeur Individual	Total
17,816	44,850	350	3,080	66,096

Table 2 shows the evolution of participation of the firms:

Table 2

Participation evolution

Year	Qty of Firms	Growth against previous year (%)
NI (*)	3,488	N/A (**)
2013	3,367	N/A (**)
2014	5,471	62%
2015	10,661	95%
2016	43,109	304%
Total	66,096	

(*) NI = The year when the firm first registered itself to participate in the award was not identified in the database.

(**) N/A = Not applicable

Total sample = 66,096 entries

Based on the numbers in the table above, it can be concluded that the interest of participation in the MPE Brazil grew exponentially from 2013 to 2016.

Table 3 uses the winners' database to show only the winners at the state level (231 companies):

Table 3
Winners at state level

Variable	Owner	Male	Female	Specialization	Doctorate	Master	College	Uncollege	Hschool	Unhschool	Elementary
Qty	56	131	100	77	1	18	103	11	16	2	1

Variable	Unelementary	Wschool	Retail	Service	Industry	Agribusiness	Active	Individual	Micro	Small	Medium
Qty	2	0	33	155	43	0	230	0	33	195	3

Total sample = 231 entries

Information understood from the table above:

a) Owner: Only 56 of 231 forms were filled out by owners.
b) Male: 131 men answered the survey.
c) Female: 100 women answered the survey.
d) Service: Service was the market segment with the most winners at 155.
e) Specialization: 77 winners had a scholarly degree of specialization.
f) Active: From 231 winners at the state level, 230 are still active.
g) Small: 195 companies that won the award at the state level were classified as small.

Descriptions of Variables:

The idea was to take the longevity of the companies that won the MPE Brazil award as a proxy for performance, following Runyan et al. (2018), and study the interaction of endurance with other selected variables. In order to do that, the proxy *Active* was created, which indicated if the firms had an active status (1=yes, 0=no) in the *Receita Federal do Brasil*—the Brazilian government department responsible for the registration of all companies.

Another point was to add to the database the Human Development Index of the cities where the firms were located at that time. The intention of this inclusion was to study whether there was a relationship between the winning companies and the level of development of the cities.

Dummies were created for the following variables:

a) The size of each company (entrepreneur individual, micro, small, and medium)
b) Female
c) Level of education
d) Market segments (retail, service, agribusiness, industry)

As the original data did not have the revenue of the firms, only the classification of companies based on the fixed range of income, an alternative method defined each variable using the set range divided by the number of employees to create a revenue per capita. This was completed for entrepreneur individual, micro, small and medium enterprises.

The description of all the variables of the database can be found in Appendix A.

Table 4 describes each variable used in the model:

Table 4
Descriptions of variables

Variable Name	**Description**	**Dummy**
Active	If the company won the MPE Brasil (State Level) and is still active (The website of *Receita Federal do Brasil* is the information source)	Yes
Statewinners	Winners of MPE Brazil - State Level	Yes
Employees	Natural logarithm of the number of employees	No
Existence	Years of existence counting until July 12, 2018 (Date when research began)	No
Yearsregistered	Years that the company registered itself in the MPE Brazil process counting until July 12, 2018 (Date when research began)	No
IDH	Human Development Index	No
Owner	If the person who answered the survey was the owner of the company	Yes
Female	If the respondent was female	Yes

Specialization	Level of education, where the applicant had a level of education greater than college.	Yes
Service	Company belongs in the service segment	Yes
Small	Identifies the companies that are considered small enterprises according to the Brazilian Government.	Yes
Rsmall	Natural logarithm of maximum range of revenue of small enterprises (R$ 4,800,000.00) divided by number of employees	No

Descriptive Statistics

Outliers were identified in the original database for the quantity of workers and for the maximum range of revenue of small enterprises. Variables were created to minimize the effects: Employees—the natural logarithm of quantity of workers of the firm—and Rsmall—the natural logarithm of the maximum range of revenue of small enterprises divided by quantity of workers of the firm. For the remaining variables, the values presented in Table-5 showed that they are inside of normality.

Table 5 shows the descriptive statistics of the variables:

Table 5
Descriptive Statistics

Variables	Average	Median	Minimum	Maximun	Standard Deviation	C.V.	Skew	Curtose Ex.
Active	0.003	0.000	0.000	1.000	0.059	16.923	16.863	282.380
Statewinners	0.003	0.000	0.000	1.000	0.059	16.886	16.827	281.130
Employees	1.871	1.792	0.000	10.166	0.943	0.504	0.148	
Existence	13.187	10.038	1.140	78.915	9.613	0.729	1.492	2.606
Yearsregistered	2.445	1.914	1.751	5.256	0.888	0.363	1.605	1.534
IDH	0.752	0.768	0.503	0.862	0.065	0.086	-1.168	1.054
Owner	0.205	0.000	0.000	1.000	0.403	1.971	1.464	
Female	0.406	0.000	0.000	1.000	0.491	1.210	0.384	-1.853
Specialization	0.078	0.000	0.000	1.000	0.269	3.430	3.138	7.847
Service	0.370	0.000	0.000	1.000	0.483	1.304	0.537	-1.712
Small	0.679	1.000	0.000	1.000	0.467	0.688	-0.765	-1.415
Rsmall	9.007	12.819	0.000	15.384	6.254	0.694	-0.720	-1.428

Total sample = 66,096 entries

Table 6 evaluates the correlation among the variables:

Table 6
Correlation Matrix

Active	Statewinners	Employees	Existence	Yearsregistered	IDH	Owner	Female	Specialization	Service	Small	Rsmall	**Variables**
1	0.998	0.056	0.029	0.074	-0.004	0.005	0.004	0.056	0.037	0.021	0.015	Active
	1	0.057	0.029	0.074	-0.004	0.006	0.003	0.056	0.037	0.021	0.014	Statewinners
		1	0.238	0.067	0.040	-0.185	-0.080	0.047	0.098	0.351	0.262	Employees
			1	0.105	-0.007	-0.070	-0.031	-0.003	-0.104	0.153	0.133	Existence
				1	-0.097	0.184	0.006	0.030	-0.025	-0.090	-0.101	Yearsregistered
					1	-0.127	-0.022	0.022	0.108	0.184	0.183	IDH
						1	0.012	0.031	0.038	-0.448	-0.452	Owner
							1	0.045	0.015	-0.074	-0.068	Female
								1	0.107	-0.003	-0.008	Specialization
									1	-0.059	-0.071	Service
										1	0.991	Small
											1	Rsmall

Table 6 shows the relationships between the following variables:

a) Multicollinearity could be expected between the variables Statewinners and Active, which presented a value of 0.998, and between Rsmall and Small, which presented a value of 0.991.

b) Employees had a positive but low correlation with Active (0.056).

c) Years of Existence had a positive but low correlation with Active (0.029).

d) Years Registered in the MPE Brazil presented a higher correlation with Active than Years of Existence (0.074).

e) Human Development Index (variable IDH) presented a low and negative correlation with Active, showing that it is not possible, based on the data, to confirm a relationship between these two variables (-0.004).

f) Owner, where owners answered the MPE Brazil survey, presented a positive but low level of correlation with Active (0.005).

g) The same occurred for Female compared to Active (0.004).

h) Specialization, where the applicant had a level of education greater than college, presented a positive correlation with Active (0.056).

i) Service, where applicants belonged to the service market sector, showed a positive but still low level of correlation with Active (0.037).

j) Small—small companies—and Rsmall—having a revenue per capita—both had a low correlation with Active (0.021 and 0.015, respectively).

k) The Human Development Index had a positive relationship with the variable Small (0.184).

l) The correlation between the variables Owners and Small was positive and relevant (0.448).

According to Wooldridge (2013), an index with results 0.600 or higher between the variables can be considered multicollinear.

5 Results Analysis

Following is the Logit model used for extracting information from the database. The output:

a) Model Logit, used observations 1-66,096 (n=60,500)
b) Ignored 5,596 absent or incomplete observations
c) Dependent variable: Active
d) Standard errors based on the Hessian

Table 7
Logit Model Results

Variables	Coefficient	Stand. Deviation	Z	p-value	Significance
Const	-10.809	1.054	-10.250	p < .001	***
Employees	0.581	0.135	4.303	p < .001	***
Existence	0.017	0.008	2.092	0.037	**
Yearsregistered	1.040	0.075	13.820	p < .001	***
IDH	-2.244	1.279	-1.755	0.079	*
Owner	0.501	0.202	2.481	0.013	**
Female	0.221	0.175	1.264	0.206	
Specialization	1.134	0.192	5.912	p < .001	***
Service	1.384	0.191	7.247	p < .001	***
Small	2.561	2.233	1.147	0.251	
Rsmall	-0.149	0.173	-0.862	0.389	

Nota. (***) significance at 1%, (**) significance at 5%, (*) significance at 10%

Table 8
Additional information about the result of the Logit model

Average of Dependent Variable	0.002314	Standard Deviation Dependent variable	0.048049

R-Square of McFadden	0.223819	Adjusted R-Square	0.212702
Likelihood Log	-768.0026	Akaike Criteria	1,558.005
Schwarz Criteria	1,657.12	Hannan-Quinn Criteria	1,588.780

Number of cases "correctly forecasted" = 60360 (99.8%)

f(beta'x) in the average of independent variables = 0.001

Likelihood ratio test: Qui-Square (10) = 442.922 [0.0000]

Based on the information presented in Table 7:

a) The constant presented a negative relation, but with a significance of 1%.
b) The variable IDH had a negative, but significant (at 10%), relation with the dependent variable Active. This shows that being located in a developed city, based on the Human Development Index, does not necessarily contribute to performance.
c) Another negative relation was with Rsmall, but this had no significance to the research.
d) On the other hand, it can be seen that Employees (significance at 1%), Existence (significance at 5%), Yearsregistered (significance at 1%), Owner (significance at 5%), Specialization (significance at 1%) and Service (significance at 1%) had a positive impact on the Active variable. Those variables could be determinants for Active since they positively impacted longevity. The quantity of the years of existence and the amount of time that the companies are registered with MPE Brazil were good indicators of longevity.
e) Having a good level of education was also a good indicator (Specialization–significance at 1%) as well as being in the service market sector.
f) Being an owner of the company and responsible for answering the survey showed a positive importance (Owners–significance at 5%).
g) Within gender, there was no clear impact on performance since the Female variable presented no significant relation with Active. The same occurred with the variable Small. Being a small business was not a determinant of longevity.
h) In the model presented, the variable that represented the winners of MPE Brazil at a state level (Statewinners) was dropped by the model and was not considered in the calculation. This variable presented a high likelihood of multicollinearity with Active.

Based on the results presented in Table 8 above, the variables of the model explained 21% of the results (Square-R Adjusted = 0.213)

Binary logit marginal effects (evaluated at means of regressors)

Note: dp/dx based on discrete change for Owner, Female, Specialization, Service, Small
Active = 1, Pr = 0.0006

Table 9
Logit Model Results–Marginal Effects

Variables	dp/dx	Standard Error	z	p-value	xbar
Employees	0.0003	8.19E-05	3.9560	p < .001	1.8572
Existence	9.31E-06	4.62E-06	2.0125	0.0442	13.1130
Yearsregistered	0.0006	8.10E-05	7.1666	p < .001	2.4404
IDH	-0.0013	0.0007	-1.7275	0.0841	0.7527
Owner	0.0003	0.0002	2.0574	0.0396	0.1798
Female	0.0001	0.0001	1.2222	0.2217	0.4032
Specialization	0.0011	0.0003	3.3806	0.0007	0.0787
Service	0.0010	0.0002	5.0400	p < .001	0.3657
Small	0.0011	0.0010	1.1406	0.2540	0.6993
Rsmall	-8.34E-05	9.82E-05	-0.8495	0.3956	9.3072

Analysis of the dp/dx of the variables:

a) Employees: For each additional percentage point of the variable, the marginal effect over the likelihood that the company continues to be active was 0.0003%, significance at 1%.
b) Existence: For each additional year of the variable, the marginal effect over the likelihood that the company continues to be active was 0.00001%, significance at 5%.
c) Yearsregistered: For each additional year registered at de MPE Brazil, the marginal effect over the likelihood that the company continues to be active was 0.0006%, significance at 5%.
d) IDH: For each additional percentage point, the marginal effect over the likelihood that the company reduced 0.0013%, significance at 10%.
e) Owner: For each additional owner that answers the survey to participate in the MPE Brazil, the marginal effect over the likelihood that the company continues to be active was 0.0003%, significance at 5%.
f) Female: It was not significant for the model.
g) Specialization: For each additional person that answers the survey to participate in the MPE Brazil having specialization (level of education), the marginal effect

over the likelihood that the company continues to be active was 0.0011%, significance at 1%.

h) Service: For each additional company that belongs to the service market segment, the marginal effect over the likelihood that the company continues to be active was 0.001%, significance at 1%.
i) Small: It was not significant for the model.
j) Rsmall: It was not significant for the model.

The resulting numbers from the output of the Logit model presented relevant considerations:

a) There was a positive and robust relationship between longevity of these companies (variable Active) and the winners of MBE Brazil (variable Statewinners), which showed that almost all state winners are active.
b) According to the presented numbers, the companies that were in the service market segment belonged to the major group of state winners.

The information presented above should incentivize MSMEs to participate in quality awards like the MPE Brazil because of the essential benefits that participating could bring for attendants, especially in the awards that give back self-assessment reports.

6 Final considerations

The Micro, Small and Medium Enterprises (MSME) are important for the economies of developing countries. Continuing to find ways to transfer the knowledge of the best management practices to these companies will give them a chance to remain active, fruitful companies.

Based on the results presented in Tables 7, 8, and 9, employees, the number of years in existence, and having the owner participate in the survey answering process are all important elements for increasing the likelihood of a company's longevity. (Regarding the latter element, an owner can be specified as the person who best understands the business of his or her company.)

The hypothesis, where a positive relationship exists between the performance of MSME and participation in quality awards, was confirmed.

This paper contributes to academic studies about MSME, adding a view concerning the subject and proposing a way to allow MSMEs to better understand their own companies, and how these companies can benefit from this new knowledge. Their participation in quality

awards, such as MPE Brazil, and the sub-products of this participation, bestows an essential knowledge upon all attendees—regardless of victory—through the self-assessment report based on the completed survey from the registration process.

Although the initial expectation was to have access to a broader volume of data, this research was limited by the information available in the database granted. However, this limitation was not a deterrent.

Now, armed with more knowledge regarding the subject, it is an open route to contribute to the study of MSMEs. These companies are major employers, contributing significantly to increasing employment and developing the economy in many cities. Better understanding how this segment of the economy works, and knowing how to help MSMEs increase their longevity as much as possible, could be a chance to contribute to knowledge dissemination and improve the economy performance as a whole.

It was not possible to have access to the financial information of the companies listed in the database. It was then necessary to adapt some variables in order to continue the research. Although, it could be a good opportunity for future research to have access to financial information in order to show the impact in the results of companies who participate in quality awards, like MPE Brazil. It would be essential to collect financial results of all the MPE Brazil applicant companies during a certain period, to better evaluate the progression of the firms who participated in the award and the firms who won.

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Appendix

As mentioned before, the original database granted by SEBRAE regarding the MPE Brazil award has many fields of information. For the purpose of this paper, only a subset of the original database was used, and data that would fail to contribute to the objectives of this research was not treated.

List of fields used as a subset of the SEBRAE database:

# var	Variable Name	Dummy	Description
1	Workers	No	Number of employees
2	Natwinners	Yes	Winners of MPE Brazil - National Level
3	Statewinners	Yes	Winners of MPE Brazil - State Level
4	Existence	No	Years of existence until July 12, 2018 (date when research began).
5	Yearsregistered	No	Years that the company registered itself in the MPE Brazil process counting until July 12, 2018 (date when research began).
6	IDH	No	Human Development Index
7	Owner	Yes	If the person who answered the survey was the owner of the company.
8	Male	Yes	The respondent was male.
9	Female	Yes	The respondent was female
10	Specialization	Yes	Level of education, where the applicant had a level of education greater than college.
11	Doctorate	Yes	Doctorate degree
12	Master	Yes	Master degree
13	College	Yes	College degree
14	Uncollege	Yes	Uncomplete college degree
15	Hschool	Yes	High School degree
16	Unhschool	Yes	Uncompleted High School degree
17	Elementary	Yes	Elementary School degree
18	Unelementary	Yes	Uncompleted Elementary School degree
19	Wschool	Yes	Without schooling
20	Retail	Yes	The company belongs to the retail segment.
21	Service	Yes	The company belongs to the service segment.
22	Industry	Yes	The company belongs to the industry segment.
23	Agribusiness	Yes	The company belongs to the agribusiness segment.
24	Active	Yes	If the company won MPE Brazil (State Level) and is still active. (The website *Receita Federal do Brasil* is the information source.)
25	Individual	Yes	Identifies the companies that are considered an individual entrepreneur according to the Brazilian Government.

26	Micro	Yes	Identifies the companies that are considered Microenterprise according to the Brazilian Government.
27	Small	Yes	Identifies the companies that are considered a small enterprise according to the Brazilian Government.
28	Medium	Yes	Identifies the companies that are considered a medium enterprise according to the Brazilian Government.
29	Employees	No	Natural logarithm of the number of employees.
30	Rindivivual	No	Natural logarithm of the maximum range of revenue (R$ 81,000.00) of entrepreneurial individual divided by number of employees.
31	Rmicro	No	Natural logarithm of the maximum range of revenue of microenterprises (R$ 360,000.00) divided by number of employees.
32	Rsmall	No	Natural logarithm of the maximum range of revenue of small enterprises (R$ 4,800,000.00) divided by number of employees.
33	Rmedium	No	Natural logarithm of the maximum range of revenue of medium enterprises (R$ 300,000,000.00) divided by number of employees.