

Development of an associative and predictive model to identify the main factors that affect the survival of SMEs in the commerce sector at the national level

Desarrollo de un modelo asociativo y predictivo para identificar los principales factores que afectan la supervivencia de las PYME en el sector del comercio a nivel nacional

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Abstract

In Mexico, Small and Medium Enterprises (SMEs) are an important segment of the country's economy. Franco & Somohano (2010), describe them as the generators of employment and the role they play as generators of wealth.

An analysis of the trade sector at a national level is considered as a delimitation, using the INEGI databases as a source and the following variables are contemplated: Total Employed Personnel, Total Paid Personnel, Total Gross Production, Total Investment, Total Assets Assets, Total of Expenses, Total Income; of the "Economic Censuses" (INEGI, 2004), (INEGI, 2009) and (INEGI, 2014). The methodology to be used is mixed; quantitative in the statistical analysis of data and qualitative in the description and interpretation of results so that the user of statistical and financial information can make decisions that help avoid the death of a SME, based on criteria, theories and appropriate recommendations to the commerce sector at the national level.

SMEs, Death, Analysis, Competitiveness, Strategy

Resumen

En México, las Pequeñas y Medianas Empresas (SMEs), son un importante segmento dentro de la economía del país. Franco y Somohano (2010) las describen como las generadoras de empleo y del papel que juegan como generadoras de riqueza. Se contempla un análisis del sector comercio a nivel nacional como delimitación, tomando como fuente las bases de datos del INEGI y se contemplan las siguientes variables: Personal Ocupado Total, Personal Remunerado Total, Producción Bruta Total, Inversión Total, Acervo Total de Activos, Total de Gastos, Total de Ingresos; de los "Censos Económicos" (INEGI, 2004), (INEGI, 2009) y (INEGI, 2014). La metodología a utilizar es mixta; cuantitativa en el análisis estadístico de los datos y cualitativa en la descripción e interpretación de los resultados para que el usuario de la información estadística y financiera pueda tomar decisiones que ayuden a evitar la muerte de una SMEs, con base en criterios, teorías y recomendaciones apropiadas al sector comercio a nivel nacional.

SMEs, Defunción, Análisis, Competitividad, Estrategia

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Introduction

In Mexico, Small and Medium Enterprises (SMEs) are an important segment of the country's economy, Franco and Somohano (2010), describe SMEs as the generators of employment and the role they play as generators of wealth. At the same time, they are classified into two small and medium-sized companies: family businesses and non-family businesses.

The Mexican Government has increased its support to SMEs since 2004. The Ministry of Economy of Mexico with the help of the Mexican government creates different types of programs for SMEs that need to improve their participation in the domestic market and also for the international market. The size of SMEs is classified by the number of employees they have (Table 1). The main sectors are manufacturing, commerce and services (Muñoz, Gasca, and Valtierra, 2014).

Categoría de la pyme	Número de personas
Mediana	51 a 130
Pequeña	10 a 50
Micro	1 a 9

Table 1 Category of SMEs

Source: Own with support from the Ministry of Economy

This research work will only consider the analysis of the trade sector at the national level as a delimitation, taking into account the variables: Total Employed Personnel, Total Paid Personnel, Total Gross Production, Total Investment, Total Assets Assets, Total Expenses, Total Income ; of the databases provided by the National Institute of Statistics and Geography "Censos Económicos" (INEGI, 2004), (INEGI, 2009) and (INEGI, 2014).

This sector has 48.3% (2,042,642) of the businesses that exist within the national territory, 38.3% (4,686,548 million pesos) of expenses originate in this sector, 32.4% (5,592,086 million pesos) is the income that originates , and has 26.6% (6,389,648 employed persons) of all the personnel employed in our country "Economic Censuses" (INEGI, 2018).

According to data from INEGI (2012), from an analysis that was obtained in the universe of micro, small and medium enterprises, the proportion of births at the national level was 28.3% and the proportion of deaths of 22.0%, which represents that of each 100 existing establishments, between April 2009 and May 2012, so that every 100 there are 6 more establishments, which means that there is a 6.2% growth rate in a period of 37 months.

On the other hand, today, SMEs suffer important changes, but they also become easily extinguished due to their way of operating, Contreras and Juárez (2013) in their research comments that are the welfare and job satisfaction factors that are related to organizational development.

In addition, the effect of leadership styles on the well-being of subordinates and their relationship to job performance, Dunham-Taylor (2000) ensures that as soon as they manage to inspire and motivate workers, which makes it possible for them to find him meaning to their work and meaning to what they do Sparks and Schenk (2001) focus on psychological capital that is defined as a positive state of development characterized by four variables: 1) self-efficacy, 2) optimism, 3) hope, and 4) resilience (Luthan, Youssef and Avolio, 2007).

Other authors such is the case of Morales et al. (2015), assure in their research that the organizational, productivity and competitiveness aspects were found in organizational structure, intellectual capital and administrative processes as possible critical factors of the structural aspects of an entity. Likewise, the quality of products or services, differentiation from competition, research and development of these are the fundamental components of the productivity of SMEs.

As mentioned by Morales et al. (2015), Ferrano and Stumpo (2010), the production or development of the SMEs is mainly linked to the domestic market, so a significant part of the population and the economy of the region depends to a large extent on its activity; also cites Martínez (2013), who mentions that SMEs that, due to their small scale and limited knowledge of the domestic sphere, are not considered to be able to take advantage of the opportunities offered by international markets.

But now in the XXI century globalization brings new opportunities and companies have a different way that day by day is reflected in the new ways of marketing their products, where even then the big companies are the most benefited.

Due to the above, the causes attributable to the disappearance of SMEs are the lack of specialization, high costs of raw materials, more demanding payment conditions, proportionally larger inventories, difficulty in obtaining financing and little or no knowledge of the current fiscal regulations. inefficient workforce due to lack of education and training to the same.

Methodology to be developed

It starts under the premise of being a Mixed investigation; Quantitative in the statistical analysis of hard data from the INEGI databases (2004, 2009 and 2017) using a correlational analysis regarding the variables: Total Employed Personnel, Total Paid Personnel, Total Gross Production, Total Investment, Total Acquis of Assets, Total Expenses, Total Income and Qualitative. In the description and interpretation of the results so that the user of statistical and financial information can make decisions that help avoid the death of an SME, based on criteria, theories and recommendations appropriate to the trade sector at a national level.

Objective of the investigation

Determine the variables and their correlation that allow observing or projecting the possible death of the SMEs based on the historical factors provided by the INEGI, as a source of reliable information in Mexico; so, entrepreneurs have enough information to be able to avoid it.

Research question

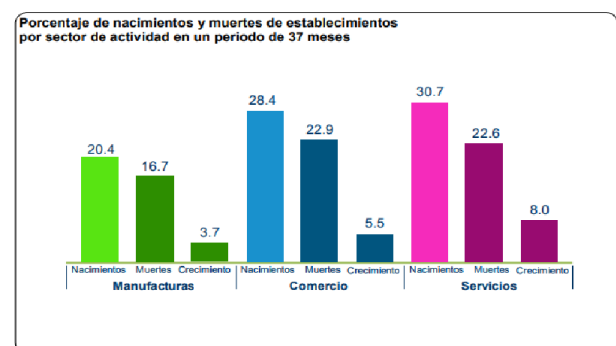
In what way do the variables influence: -the total investment, -the gross total production, -the employed personnel, -the salaries, -the expenses, -the income, -the stocks and -the fixed assets in the death of an SMEs ?

Analysis from the regression

- According to data from INEGI (2012), it assures that approximately 28.3% are born at the national level and 22.0% of every 100 micro, small and medium enterprises die, which represented a growth of 6.2% in a period between 2009 and 2012 37 months.
- SMEs suffer important changes, but they become easily extinguished due to the way they operate; Welfare and job satisfaction are one of those factors (Contreras and Juárez, 2013).

Casas and Urrego (2012), affirm that the global trend of globalization has reformed the different processes of the companies, not only the productive models, but also the other areas of the organizations. The Information and Communication Technologies (ICT), have allowed to optimize process, innovate in the provision of services and modify the management of organizations around the same technology.

Figure 1 shows the births and deaths of establishments by sector of activity in a period of 37 months, which shows that the trade sector reason for research is an important sector in the Mexican economy.



Graph 1 Percentage of births and deaths of establishments by sector in a period of 37 months.

Source: INEGI (2018)

Figure 2 shows, based on the INEGI census, according to the time classification, how much is the percentage of companies that live and how much is the percentage of companies that die.

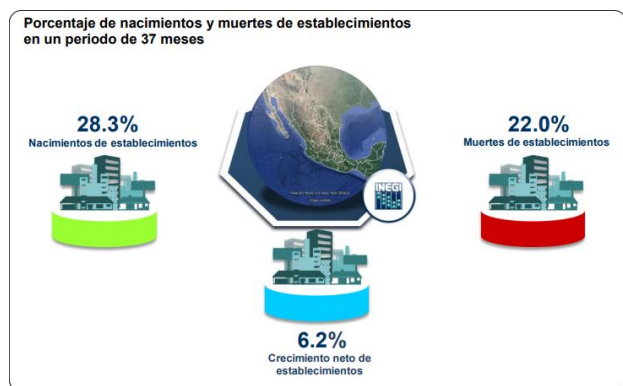
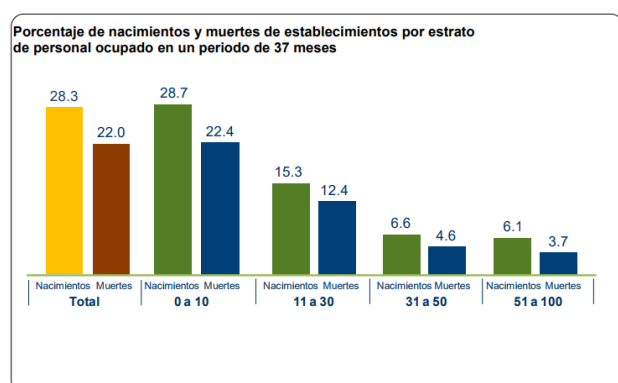


Figure 1 Percentage of births and deaths of establishments in a period of 37 months

Source: INEGI (2018)

Graph 2 shows the percentage of birth and deaths of establishment by stratum of personnel employed in the same period.



Graph 2 Percentage of births and deaths of establishments by stratum of employed personnel in a period of 37 months

Source: INEGI (2018)

The statistical analysis shows that there is a great linear correlation between the dependent variable Economic Unit and the dependent variables: Total Employed Personnel, Total Paid Personnel, Total Gross Production, Total Investment, Total Assets Assets, Total Expenses, Total Income, that it is clear that the variables considered by the INEGI have to do with the operation of an entity, as shown in Table 2:

Matriz de correlaciones^{a,b}

	Unidad_económica	Final_ocupado	Final_remunerado	Producción_bruta	Inversión_total	Existencias	Total_activos	Total_gastos	Total_ingresos
Correlación	1,000	.990	.998	.999	.991	.170	.998	.980	.986
Final_ocupado	.990	1,000	.980	.996	1,000	.288	.979	.990	1,000
Final_remunerado	.998	.980	1,000	.994	.980	.115	1,000	.941	.973
Producción_bruta	.999	.996	.994	1,000	.996	.214	.993	.973	.983
Inversión_total	.991	1,000	.980	.996	1,000	.286	.979	.969	.989
Existencias	.170	.288	.115	.214	.286	1,000	.111	.406	.314
Total_activos	.998	.979	1,000	.993	.979	.111	1,000	.939	.972
Total_gastos	.980	.990	.941	.973	.969	.406	.939	1,000	.984
Total_ingresos	.986	1,000	.973	.983	.989	.314	.972	.984	1,000

^a Determinante = .000

^b Esta matriz no es cierta positiva.

Table 2 Matriz de correlaciones

Source: Own, with data support from INEGI and SPSS v 22.

Next, the analysis of each of the variables will be captured and a precise interpretation of what it means for an SME is given.:

This correlation matrix clearly shows that the combination of **economic unit vs. employed personnel** has a high degree of correlation .990, which indicates that in an SME this variable has an important relationship, since a company cannot operate and generate wealth without this element, they cannot subsist one from the other, although the employed personnel can be remunerated or not, as it is the case of the owners and partners.

While the **economic unit vs salaried personnel** has a high correlation of .998, what differentiates it from the contrast against the employed personnel, since it involves all personnel who obtain a salary or salary for their services provided to the company in a manner subordinate.

Economic unit vs gross production, it has a .999 correlation, which indicates that a company that does not produce, market or provide its services can not subsist, it is the reason to live of an SMEs, every productive company generating wealth should generate its income based on the preparation of their products, purchase and sale of products already manufactured and services.

Economic unit vs. total investment, it has a .991 correlation against the dependent variable which means that without the investment that is to say the resources, the working capital of a company, can not exist and survive because it is a valuable asset that must be deal with moderation and spend with certain provisional guidelines framed in an intelligent and conservative planning or spending program without leaving aside the business opportunities that arise locally, nationally or globally.

Economic unit vs. stocks, these have .170 correlation, which indicates that currently companies do not need to have abundant inventories, on the contrary, they must adopt productive systemic thinking to help decision-making; the slender production suggests as opportunities for continuous improvement, through the elimination of waste from the production process, since there are processes that do not add value to the product.

For example, Toyota and Honda have shown over the last few years, that any competitive advantage is temporary and must undergo constant adaptation process by all members of the value network and if this applies to large companies, to The SMEs is not the exception because in this globalized world and to be competitive it is better to adapt to the new conditions that the market is having (Morales, Rojas, Flores, Tejeida and Hernández, 2014).

Economic unit vs total assets, has a .998 correlation as well as paid staff, which indicates that the assets that the company has are and must be necessary to generate wealth to this, these assets can be tangible or intangible but nowadays are of great importance for the survival of an SMEs, because the lack of these leads to the early death of the company, should be kept at the forefront and with the technology that encourages the correct accompaniment in this globalization, as a company that looks over the past due to technological advances is a company that signs its death sentence.

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Economic unit vs total income, have a high degree of correlation .986, which indicates that SMEs are able to obtain sufficient income to keep them in the market as long as they meet each of the above as their highest priority. To reach this income it is necessary to keep in mind the staff, the investment, the stocks, the assets and the wisdom to spend wisely always bearing in mind the planning, as a consequence, by maximizing the resources and spending the income generated by the activity with prudence.

Sample of it we can observe in the following sheet:

Results

It should be noted that the correlation information shows the present research work shows very explicitly the behavior of each one with respect to the dependent variable, because the correlation in the majority is very high which indicates that they are concepts that must be present in the perspective of an entrepreneur of an SMEs, if they want to remain in force and with a healthy company. On the other hand, the only variable that did not have a higher correlation was inventories (inventories), which shows that it is not necessary to have them if you dedicate yourself to trade, obviously you must have inventories, but you can also opt for the lean production methodology, in its conceptualization where it is assumed that it is not necessary to have extensive inventories and processes that do not contribute anything to the good or service.

Conclusions

The survival of the SMEs is the country should be considered a clear indicator for the economy and competitiveness of the country and not be seen as just another indicator for government agencies, acting around them with accompaniment, planning and support during the first stages of his life should be a relevant factor for all involved, this would draw a road map and success in which the economy would detonate and generate the spaces required for the growth of regions, municipalities, states and the country itself.

It is clear that the indicators and their relationships propose lines of action to be considered in the short and medium term, which is why it is necessary to implement a road map with paths and cuts that allow the flight requirements to be adjusted, classifying them by business area.

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