Managing the “Intangibles”: Business and Entrepreneurship Perspectives in a Global Context

Coordinators

By

C. Jayachandran, Gian Luca Gregori

Referred of the Society for Global Business and Economic Development
Managing the "Intangibles": Business and Entrepreneurship Perspectives in a Global Context
Università Politecnica delle Marche, Economics Faculty "Giorgio Fuà"

ISBN 978-88-907795-7-2

Innovation as competitiveness factor in Guadalajara´s SMEs manufacturing Industry

Cinthya Karina Camacho-Sotelo, cinthya_camacho09@hotmail.com
Jose Sanchez-Gutierrez, jsanchez@cucea.udg.mx, jsanchez0202@hotmail.com
Paola Irene Mayorga-Salamanca, mayorga.paola20@gmail.com
Marketing & International Business Department, University of Guadalajara, Mexico

Innovation as competitiveness factor in Guadalajara´s SMEs manufacturing Industry

Abstract

The purpose of this research is to get to know the importance that innovation has in the competitiveness of the SME in Guadalajara. The method used for this job is the usage of structural equations to correlate innovation and competitiveness. In this way we are able to find out how important is innovation in the Guadalajara's SMEs. With the support of this method we found out what are the most significant factors, also which ones are most likely to be used for the SMEs sector in order to have better competitiveness.

Introduction

Innovation is nowadays considered by the SMEs as a strategy of making having a better job done by every single companies department. This is not only for company survival but is also seen as a way to strengthen the company's foundations, (Castellanos, 2003).

Companies understand that this new marketing dynamic where the companies have to completely understand what the customer wants; also it has to have the capability of adapting to their customer needs (Lafuente & Bassa, 2011).Thus is achieved by adapting to new business processes, developing and revamping their products in short continuously evolving and meeting the expectations from their customers. There are precedents were companies had work hand to hand with their providers to develop innovation projects that as a result left better techniques of developing products and services. (Nordberg, Campbell & Verbeke, 2003).

Innovation and competitiveness

The research of this factors competitiveness and innovation is not something new; they have been studied since the 1960's. Authors like Porter determined that the competitiveness of a nation was determined by the capability of innovate and improve (Aguada, Navarro & Meza, 2013).

One of the first authors that began talking about innovation was Schumpeter cited by (García, Serrano & Blasco, 2005) developed the theory of innovation as the means to explain the economic development and analyzing the technology change. He basically found the difference between invention and innovation. Invention is the creation of new things and innovation being the application of the invention of new products or processes of production and its application on commercial uses.

In 1991 the OCDE considered that the technologic innovation was only for the companies in the manufacturing sector and that it was focused only on products and technical processes. Later in 2005 the OCDE widen the concept of innovation to the service industries because that economic activity gives higher economic output and better profits in those industries.

Innovation does not only limit to the radical changes in the products it also has expanded to different company areas. Many authors agree that the term innovation takes in changes in productivity methods, supply, distribution and workforce capabilities (CE, 2003), as well as services and consumer satisfaction (Valls Pasola, Guitart. & Núñez 2007), making a change in the methodology and technology; a useful deviation on how things were done before (Bateman & Snell, 2009).

Therefore innovation can be considered as a necessary ingredient to have a better competitive advantage(Darroch & McNaughton, 2002); due to innovation Damanpour & Gopalakrishnan, 2001), cited by Naranjo, Jiménez& Sanz, 2012 generated competitive advantages in for the enterprises. Enterprises become more flexible and are able to adapt faster to any given changes. Also they are able to exploit opportunities better than their competitors, thus getting positive effects for the enterprises making them more profitable (Prajogo, 2006; Berson, Oreg & Dvir, 2008), cited by Prajogo, (2006).

Then the technology factor along with the ability of innovation are a source of a great competitive advantage (Galende & Suárez, 1999). Nowadays companies that want to generate and acquire the latest technological advancements to better their productivity and have a higher competitiveness rate.

If the companies want to keep being competitive have to get more technological capabilities and introduce innovation in processes and products that allow them to raise the productivity and their distinction from their competitors (García, Serrano & Blasco, 2005).

Additionally when competitiveness is given by free market conditions in a given country it could produce goods and services that can exceed international standards; as well it allows maintaining the growth of the local GDP (OCDE, 2010.)

Some of the indicators that measure competitiveness are performance. Performance shows the results of different companies obtained by the competitive process and its competitive potential. Sales and exports show the growth of the participation on the market as well as profitability and some others, (Pérez & Velásquez, 2013.)

Then, that companies innovation have a great development for them and generates benefits in the sector that is being developed. It generates competitiveness between companies of the same kind generating a chain of knowledge and improvement for the companies in the same sector.

Research Method

For the analysis of the data of this research we used the method of differential equations which allows giving the type and direction of relations contained in the analysis so we can estimate the parameters specified by the relationships in a theoretical level. Structural equations are confirmatory models due to the fundamental interest is to confirm thru the analysis of the sample of the relations given by the explicatory theory that is chosen to use as a reference (Ruiz & San Martin, 2010).

Sample

In order to analyze the variables of innovation and competitiveness we applied 409 well-structured surveys to the object of study which in this case were the SME sector of Guadalajara.

Results

The method that was used is estimation ML-robust which throws very robust statistical data that allow us to verify that the theoretical model is correct which includes the scaling correction $\chi 2$ Santorra-Bentler and corrects the possible errors according to the normality. What was mentioned before it is possible because the data comes out from surveys that contain Likert scale, which can present problems of normal distribution due to the variables which are not continuous (Alvarado, Sadín, Valdez, González & Rivera, 2012.)

After that, the model was adjusted considering as a guide the set of non-normal fix index, (Brown, 2006.) Which are NFI, NNFI and CFI, the values for those have to be between 0.80 and 0.89 and they represent a reasonable fit, (Segars & Grover, 1993.) On the following Chart 1, show that all the values go over what it's acceptable getting an NFI of .862 and NNFI of 0.845 finally a CFI of 0.861. With this data, it's corroborating that the model is acceptable. On the other hand Jöreskog y Sörbom (1986,) state that the value of RMSEA has to be under 0.80 to be acceptable but in this case the RMSEA value is 0.60 which indicates that the model is correct.

Related to the factorial loads Bagozzi and Yi, (1988,) they state that the factorial loads have to be above 0.60, and in the table 1 shown that all the factorial loads of this particular model are above this value.

The value for the reliability index IFC and the index of extracted variable IEV they should be above 0.70 and 0.5 respectively, Fornell and Larcker (1981), which is easily achieved in the theoretical model.

All the indexes and values previously mentioned achieve the previously established by the theoretical, which allows us to state that the theoretical model is correct for application of structural equations is shown by the table below.

TABLE 1: INTERNAL CONSISTENCY AND CONVERGENT VALIDITY OF THE THEORETICAL MODEL

Variable	Indicator	Factor Loading	Robust t-value	Cronbach´s Alpha	CRI	VEI
Implementacion of changes	AIC1	0.644***	1.000*	0.872	0.872	0.51
	AIC2	0.711***	15.116			
	AIC3	0.752***	13.808			

	AIC4	0.682***	11.643			
	AIC5	0.674***	11.311			
	AIC6	0.736***	13.278			
	AIC7	0.716***	12.652			
Barriers to innovation	AIB7	0.636***	14.417	0.839	0.839	0.501
	AIB8	0.697***	16.499			
	AIB9	0.746***	16.858			
	AIB10	0.705***	15.789			
	AIB11	0.664***	14.697			
	AIB14	0.584***	28.863			
	AIB16	0.528***	12.758			
Financial Performance	FP1	0.753***	1.000*	0.833	0.833	0.505
	FP2	0.772***	13.859			
	FP3	0.715***	10.413			
	FP4	0.738***	11.672			
Costs Reduction	PC2	0.573***	9.82	0.76	0.762	0.5
	PC3	0.776***	16.971			
	PC4	0.741***	16.218			
	PC5	0.566***	10.634			
Technologhy Use	TE1	0.673***	1.000*	0.848	0.849	0.508
	TE2	0.761***	14.92			
	TE3	0.721***	14.515			
	TE4	0.724***	14.305			
	TE5	0.618***	11.182			
	TE6	0.670***	12.673			
$S\text{-}BX^2$ (df = 503) =1235.7893 ($p < 0.0000$); NFI = .862 ; NNFI = .845 CFI = .861 ; RMSEA = .060						

Source: Own elaboration
* = Parameter constrained to this value in the identification process
*** = $p < 0.001$

The table 2 shows the validity of the theoretical model by values like IEV and it is shown diagonally from left to right and top to bottom, those values were previously mentioned, which has to have values above 0.50. Above the diagonal IEV we have the variance and then underneath the IEV we have the confidence coefficient, which we can appreciate an interval of 90% of confidence. Also we can see that none of the individual latent factors from the correlation matrix has the value of 1.0 which indicates the inferior and superior limits (Anderson & Gerbing, 1988).

TABLE 2: DISCRIMINANT VALIDITY OF THE MEASUREMENT OF THE THEORETICAL MODEL

Variables	**Implementacion of changes**	**Barriers to innovation**	**Financial Performance**	**Costs Reduction**	**Technologhy Use**
Implementacion of changes	**0.51**	-0.089	0.231	0.214	0.472

Barriers to innovation	-0.181 , 0.003	**0.501**	-0.051	0.063	-0.105
Financial Performance	0.139 , 0.323	-0.149 , 0.047	**0.555**	0.084	0.356
Costs Reduction	0.142 , 0.286	-0.019 , 0.145	0.01 , 0.158	**0.505**	0.208
Technologhy Use	0.346 , 0.598	-0.105 , -0.105	0.244 , 0.468	0.128 , 0.288	**0.5**

Source: Own elaboration

The Chart 3 indicates the result of the hypothesis from this investigation for this particular case we achieved 3 different hypothesis.

H1: The standardized coefficient is 0.531, with this data we can show that when they are changes done in companies it generates more innovation.

H2: The standardized coefficient is 0.616 were the effects of having fewer barriers of innovations it's conducive to generate more innovation

H3: The standardized coefficient is 0.420 this means that innovation affects in a positive manner competitiveness.

TABLE 3: SEM RESULTS OF THE THEORETICAL MODEL

Hypothesis	Structural relationship	Standardized coefficient	Robust t-value	Measure of FIT
H1: To a higher implementacion of changes, a higher innovation	Implementacion of changes → Innovation	0.531***	12.968	$S\text{-}BX^2_{(491)}$= 1206.3072 p = 0.000
H2: To a lower barriers to innovation, a higher innovation.	Barriers to Innovation → Innovation	0.616***	17.125	NFI = 0.866 NNFI=0.845
H3: To a higher innovation, a higher competitiveness	Innovation → Competitiveness	0.420***	13.098	CFI = 0. 864 RMSEA = 0.060

Source: Own elaboration

*** = p < 0.001

The conclusion that the 3 hypothesis have significant values for the theoretical model. Hypothesis number 2 we obtained a standardized coefficient of 0.616 which indicates that the factor of fewer barriers of innovation helps companies to be more innovative and this weight more in the investigation. When the standardized coefficient was 0.420 indicates that innovation affects the competitiveness of manufacturing companies, even thought it was the lowest standard it does not necessarily mean that it is something negative it just allow us to make a differentiating point between all the hypothesis.

Conclusions

Upon checking all the literature with this work we can conclude that innovation is all those gradual or radical changes in their products, means of production and commerce. And these changes can be applied in any type of industry, next it allows industries to be in a better competitive position. Mexico is one of the countries that is far behind in competitiveness technology.

There are many different concepts for competitiveness and also many indicators that measure whether a company, industry or country is competitive. But there is no universal fully accepted indicator by all authors. The most respected indicators can be determined by international institutions like WEF, in the reports that are published on a yearly basis Mexico has not performed not that well just being in the middle spots.

Thanks to the analysis of the statistical data of the SMEs in the manufacturing sector of Guadalajara, we can conclude that innovation does affect the competitiveness of the manufacturing sector in a positive

manner. The mentioned before shows a very competitive and positive correlation in the statistical analysis due that its factors are quite representative. It also shows that when there were any representative changes on implementation of changes inside of a company it generated many improvements in different areas of the companies. Then the barriers of innovation on the SMEs for the manufacturing sector of Guadalajara are very high that is why it is difficult for companies to innovate it is really hard to get financing and there is also innovation resistance inside of companies

At the end the manufacturing sector of Guadalajara is showing some level of innovation development and this allows us to get a diagnostic of market competitiveness. It allows us to see the strength and weaknesses of the manufacturing sector, once these are fixed and revamped it will allow the manufacturing sector to pay more attention to other deficiencies.

References

[1] Aguado, E. E, Machado, N.V & Meza, L. J. E. (2013). *Innovación para fomentar la competitividad en las pymes*. Guadalajara:Universidad de Guadalajara.

[2] Alvarado, B. G., Sandín B.J L., Valdez, M.N., González, A. & Rivera, S. (2012). Análisis factorial confirmatorio del Cuestionario SA-45 en una muestra mexicana. *Anales de Psicología,* 28(2), 426-433.

[3] Anderson, J. & Gerbing, D. (1988). Structural equation modeling in practice: a review and recommended two-step approach. *Psychological Bulletin,* 13, 411-423.

[4] Bagozzi, R. P. & YI, Y. (1998). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1), 74-94.

[5] Bateman, T.S. & Scott, A. S. (2009). *Administración: Liderazgo y colaboración en un mundo competitivo*. México: Mc Graw Hill.

[6] Castellanos, C. & Castellanos M. (2010). Concepciones teóricas referentes a la definición de la competitividad. *Contribuciones a la Economía*. Recuperado de: http://www.eumed.net/ce/2010a/

[7] Comision Europea, (2003). 112, *Innovation policy: updating the union´s approach in the context of the Lisbon strategy*. Bruselas: comisión europea.

[8] Darroch J., & McNaughton R. (2002). Examining the link between knowledge management practices and types of innovation. *Journal of Intellectual Capital*, 3(3), 210 – 222.

[9] Fornell, C. & Larcker , D. (1981). Evaluating structural equation models with unobservable variables and measurement Error. *Journal of Marketing Research,* 18, 39-50. [10] Galende, J. & Suárez, I. (1999). A resource-based analysis of the factors determining a firm´s R&D activities. *Research Policy*, 28, 891-905.

[11] García, E.J.,Serrano, C.V. & Blasco Blasco, O.M. (2005). ¿Competitividad e innovación en la micro y pequeña empresa? Retos previos a superar. *Estudios de economía aplicada*, 23 (3), 559-581.

[12] Jöreskog, K.G. & Sörbom, D..(1986). *LISREL VI: Analysis of Linear Structural Relationships by Maximum Likelihood, Instrumental Variables and Square Methods.* Mooresville: Scientific Software.

[13] Lafuente, G., A. & Bassa, L. (2011). La innovación centrada en el cliente utilizando el modelo de inferencias en una estrategia CRM. *Investigaciones europeas de dirección y economía de la empresa*, 17(2), 15-32.

[14]Naranjo, V.J.C., Jiménez, J.D & Sanz, V.R. (2012). ¿Es la cultura organizativa una determinante de la innovación en la empresa?. *Cuadernos de Economía y Dirección de la Empresa*. 15(2), 63-72.

[15] Nordberg, M., Campbell a., & Verbeke A. (2003). Using customer relationships to acquire technological innovation. A value-chain analysis of supplier contracts with scientific research institutions. *Journal of Business Research*, 56, 711-719.

*Note: Contact the authors for the full list of references.