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An Approach to the Study of Capabilities of Innovation in the Food Cluster (SME) In Aguascalientes, Mexico

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Abstract: The international crisis demonstrates the degree of strength of endogenous technological skills developed by SMEs and their ability to manage uncertainty and risks at the macro level. Thus, the role of local institutional systems of Science, Technology and Innovation (CT + I, by its initials in Spanish) in supporting and enhancing the innovative capability and boosting technological behavior, is a significant component. The importance of this work is that it identifies the formation and consolidation of the innovative capability of SMEs in the food cluster in specific territorial and economic contexts. The main objective was to identify how companies related to food cluster generate relationships in their way of functioning and linking, in order to characterize and identify some of the factors that have greater weight in the construction of their innovative capacities. The study is characterized as transversal, correlational and descriptive diagnosis. Correlation tests carried out only show the trend data on how innovative capability is built; to determine the validity of the variables in the model we proceeded to a factor analysis. The results show trouble generating virtuous local development processes, based on profiles of productive specialization focused on innovations.

Keywords- : Cluster, innovation capability, small and medium enterprises, innovation, competitiveness

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I. INTRODUCTION

In the new global competitive scheme, the way in which companies respond to this situation and how they devise, plan and carry out developments and improvements of products and processes, which lead to organizational changes aimed at new forms of market linkage, becomes important. In other words, the agents of the system try to increase their innovative capacity, understood as the potential of the agents to transform generic knowledge into specific one from their stock of competences, which involves formal and informal learning, coded and tacit [1], [2], [3], [4].

In this markedly global scenario, the endogenous techno-productive capacity of the agents and the degree of development of the territory in which they operate have become key elements for the construction of competitive advantages, where the capacity for innovation becomes vital importance [5], [6].

In this direction, the innovation capabilities can provide competitive advantages if they are based on a succession of routines and skills that are difficult to imitate or transfer, and can only be understood as a whole, which makes sense territorially. That is to say, to understand them, it is need to know the whole context where they act or are built, that is why it is talk about a specific and systemic environment [7].

The present study is located in the state of Aguascalientes, in the central zone of Mexico; the objective was to try to identify the way in which the companies that joined as food cluster establish their relationships in terms of their way of working and linking, in order to characterize it and detect some of the factors that have greater weight in the construction of their innovative capabilities.[1]

The basic question that underlies these broad guidelines seeks to answer the question of the strategies used by the companies in the analyzed cluster and the weight of the different factors that affect their innovative performance; that is, in what way do the companies that make up the food cluster in Aguascalientes establish their relationships in terms of how they function and link, and from that, how to characterize it and detect some of the factors that have the greatest weight in the construction of their innovative capabilities?

[1] The construction of innovative capacities is understood as the potential of the agents to transform generic knowledge into specific ones from their stock of competences, which involves formal and informal learning, codified and tacit (Ernst and Lundvall, 1997; Lall, 1995, Boscherini and Yoguel, 1996, Boscherini and Yoguel, 2000) acquired through existing relationships in the company in terms of internal knowledge (functioning) as knowledge acquired abroad (linkage).

The initial hypothesis is that there is a significant relationship between the companies in the aforementioned cluster, but this relationship presents a low level of integration and therefore a low innovative capacity, which is associated with low levels of development of their network entanglements, to the unequal behavior of the actors regarding several factors, such as: knowledge and use of the incentive system and support instruments; the ability of all actors to interact to produce, adapt, manage, exchange and disseminate knowledge, as well as to develop the necessary technological capabilities to create a favorable environment.

The present work exposes the results and evidences that support the proposed hypothesis, for which purpose it is structured in the following way: section 1 presents in a condensed way the state of knowledge in this field of studies; section 2 describes the methodological procedures followed to test the hypothesis; section 3 presents the analysis of the field data and discusses the results obtained; the last of them, the 4, mentions the conclusions that emerge from the problem addressed.

II. THEORETICAL REFERENCE: INNOVATION CAPABILITIES AS A SOURCE OF COMPETITIVENESS

Innovation capacities are a source of competitiveness for companies [8], [9], [10]. Leonard [8] introduces the term “Core Capabilities”, defining them as the system of activities, physical systems, skills and knowledge, as well as the management, education and reward systems, including the values that create a special advantage for an institution. Teece [9], used the term "Dynamic Capabilities" to refer to the ability of the firm to integrate, build and configure both internal and external competences and to be able to face the environment quickly and efficiently.

Also, Dosi, Nelson, and Winter [10], define the Organizational Capabilites as the know-how that enables organizations to perform certain activities, such as the creation of a tangible product or the provision of a service and the development of new products and services. These capabilities depend on skill levels and effective communication, both outside and inside the company.

For these authors, the innovation capacities are embedded within the abilities of the actors, they serve to efficiently use both their internal skills (technological learning and knowledge construction methods) and their external competences, which are directed (implicit but not necessarily) to the use of external knowledge through the establishment of networks of social relations that the company establishes with other institutions: suppliers, users, universities, research centers, etc. Not losing sight of their cultural identity (their social and cultural elements).

Innovation is linked to the generation and management of knowledge, and consequently to the learning process. The concept of innovation, therefore, part of a broad vision that includes the set of interconnected changes that are made in different areas of a company and that aim to improve their competitiveness and economic efficiency. Thus, from this perspective, innovation is not limited to isolated activities aimed at developing new products or processes, but also involves the set of developments and incremental improvements made in different areas (organization, marketing, production, etc.) and activities aimed at the development of quality and the implementation of new ways of linking with the market.

Likewise, innovations are also generated from different routine activities carried out in the company that are not necessarily involved in the productive area. Innovation capabilities are built over time and are not easy to code, so their analysis requires a heritage of competencies (their construction and reconstruction over time). In this sense, the market selection failures sometimes determine processes of destruction of capacities that do not go in a progressive sense (i.e. some careers and professions that are no longer useful in the environment). The degree of importance of innovation activities developed by institutions, their dissemination and the decoding of results by companies, shape the environment in which these activities are carried out.

Thus, it is considered that given the external crises, it is expected that the evolutionary trajectories of the companies differ [11]. That is, companies decode in different ways the uncertainties based on their background and previous history, their initial skills, the degree of connection they have with the environment and the degree of development of the environment in which they operate [12]. This results in a minimum threshold of competences (learning and specialized knowledge), without which companies can not enhance the learning processes and the transformation of generic knowledge into specific one. So, once the requirement of reaching a minimum threshold is met, the innovative capacity is influenced by factors such as: evolutionary path, ability to learn and the degree of development in which companies act, becoming less significant in environments and countries where positive externalities are generated and a national innovation system with adequate functioning.

In this way, companies must make efforts of selection and adaptation that require, as a necessary condition, minimum thresholds of codified and especially tacit knowledge. It should be noted that while the codified knowledge is basically tradable, the tacit knowledge is specific and cannot be bought in the market, which is a key element in the technological differences and in the specific competitive advantages of the companies [1], [2].

A particular characteristic of knowledge is that it cannot be completely explained, therefore, it cannot be transformed or converted into information as a transferable product [13]. This characteristic of knowledge introduces certain particularities in the conception of technology, which begins to be considered not only as a collection of machines and production techniques, but as a complex system of generation and diffusion of coded and tacit knowledge accumulated by the company [14], [1], [15].

The codified knowledge includes the set of technological knowledge (incorporated in materials, machines, components and final products) and organizational, and are transmissible by communicative interaction (internet, courses, etc.) through the market [16]. Tacit knowledge, on the other hand, involves: a) knowledge not codified in manuals about process technology applied to the work process, b) general and behavioral knowledge, c) the ability to solve non-codified problems, 4) the ability to link situations and interact with other human resources [12].

Thus, the available tacit knowledge becomes a necessary condition to use the coded knowledge. Therefore, the operationalization of codified knowledge (interpretation of engineering and design manuals, introduction of generic scientific and management knowledge, specification of quality assurance criteria, etc.) requires tacit knowledge that is manifested in organizational routines and in collective experience of teams dedicated to the research and development, management, production and marketing of the company [1].

In this sense, it is assumed that the key role of tacit knowledge is embedded in social networks and depends on the incorporated capacity of knowledge in individuals and their interaction to recognize behaviors and connections between memories, that is based on the knowledge accumulated with the experience and the automatic ability that individuals have to link knowledge to their experiences.

1.1. The formation of clusters as a competitive strategy

The economic development in the world responds to changes in social structures and specifically to market movements; The new ways in which productive strategies are formed are the key element to respond to the needs of consumers, which is why productive complexes called clusters emerge. These industrial conglomerates can be the answer to the search for higher levels of innovation and competitiveness of companies through a process of integration and associativity between each of the elements that make up the group. The consequence of this set of changes also leads to a modification of the conception of competitiveness, previously considered as a phenomenon exclusively of a macroeconomic nature determined by static comparative advantages or influenced by the factorial endowment.

In this work, *clusters* are defined as "a territorial agglomeration of closely related industries, and they are mostly born due to a historical coincidence" [17]. At the international level, the development of clusters has meant an increase in the levels of innovation, productivity and competitiveness, for this reason it is important to diagnose the situation in the way in which the various companies that make up the food cluster in Aguascalientes establish their relationships, by building its innovative capacity.

In addition to the different interrelations that are created among all the members of the *cluster*, the influence of the territorial factor and the diffusion of knowledge, there are incentives that encourage industrial integration; in this line, the main incentives for the formation of *clusters* and alliances have been the reduction of transaction costs, the development of new skills and the acceleration of the learning process [18].

Finally, it is important to point out that in the tacit aspects of the learning process there is, among other things, a crisis of the traditional methods of measuring innovative activities, which in general measure variables of the formal aspects of learning in organizations; thus, the expenditure made in the Research and Development laboratories and the development of patents are evaluated, but the importance of the incremental processes of innovation is not reflected and that the innovative capacity is spread throughout the organization [3], [19].

In this way, we start from the idea that the generation and circulation of knowledge, both within the company and between institutions, is a complex process positively related to the need to solve problems in situations of uncertainty, with the demand for solutions that are not easily codifiable, with the degree of development of the competencies of the company's human resources, the way in which the work process is organized and the degree of importance that the interpretation and adaptation of external codified knowledge have for the company. Therefore, the indicator of the innovative capacity of the agents aims to estimate, as a mere approximation, the degree of circulation of knowledge from formal and informal links developed with other agents and institutions in the territory in which they are located.

In this sense, as mentioned [20], the indicator of the innovative capacity of firms should include an evaluation of the influence and externalities produced by the economic, social and institutional environment in which companies develop their activities. Thus, the inclusion of variables that take into account the cooperation that the institution develops with other agents of its local scope can constitute an approximate indicator of the "functioning" of the environment and the quality of the territorial system.

III. MATERIALS AND METHODS

The study was carried out between 2015 and 2016. The work is a case study and is characterized by being transversal, diagnostic-descriptive, carried out through a structured questionnaire with closed responses using the Likert scale [21]. The results obtained are the product of the quantitative methodology with a non-parametric statistical strategy for classificatory variables with nominal measurement level, and in which Spearman's Rho was used [22], which allows to see the degree of relationship with respect to the key variables that have an influence on the construction of innovation and the connection of companies in the environment.

For the collection of the data, the survey technique was used, for which a questionnaire was designed and applied to the business sector aimed at its managers or owners. The instrument included 48 closed questions, divided into six sections related to the type of relationships in the territory, market, linkage, cooperation, collaboration, competitiveness system and innovation activities between companies and with other institutions. The sample size was 30 small and medium enterprises, SME (PYMES, by its initials in Spanish),[2] that make up the food cluster in Aguascalientes, of which 60.4% are small and 39.6% are medium, based on the classification of companies in the *Official Gazette of the Federation* (2011).

The variables were classified considering two specific dimensions, referred to explain if they occur and how much the relations of cooperation, collaboration and competition between the companies that make up the cluster are produced, and if the conditions that produce innovation processes and an increase in innovative capacity take place. It is assumed that a greater interaction of the actors results in a greater dissemination of knowledge and therefore a greater increase in innovation capacities. Once the variables were selected, a factorial analysis of the main components was carried out in order to verify those that have greater weight within the conglomerate. Based on these elements, a global interpretation was constructed about the way in which the technological capabilities and innovative performance of the members of the conglomerate have been generated or hindered.

The aim of the statistical analysis was to describe, "measure" and evaluate the main links that bind the food cluster companies, in order to determine the *capacity for innovation*[3] and the role played by agents in the system. The previous thing based on the evolutionist theory and the assumption that learning processes of different types are accumulated in the evolutionary path of agents, creating the accumulation of knowledge that ultimately generates the construction of innovation capabilities that are key in the competition process.

In view of the above, and in accordance with the central questions of the work, once the questionnaires were applied and the information processed, the results of the hypothesis test show a significant correlation in the dimensions of the company's innovation and linkage capacities, particularly in the subdimensions: *System of competition in the market*, *Availability of professional human resources*, *Innovation, Research, development and management* of human resources in terms of their ability to interact and generate knowledge.

But to know the weight of the variables of these subdimensions, a factorial analysis was carried out as a tool to identify the appropriate components for the companies that make up the cluster. In accordance with Hair, Rolph, Tatham and Black [23], since factor analysis is "a multivariate statistical method that allows defining the underlying structure in a data matrix", this method offered in this case a reliable procedure that effectively allowed analyze the links between a large number of variables that are highly correlated with each other. The use of this method consists of identifying the variables that have the most value within the cluster. The classification of the variables within the *innovation capacities* dimension was made taking into account the degree of learning and knowledge acquired, as well as the *linkage* dimension as the degree of interaction and communication between the companies (see Table 1).

Table 1. Variables used in the Cluster analysis

Innovation Capabilities	*Linkage*
1. System of competitiveness in the market	*8. Ability to use information with suppliers*
2. Availability of professional human resources	*9. Ability to generate alliances with clients*
3. Modality in which the company acquires learning	*10. Punctuality of delivery*
4. Decision capacity of subordinates	*13. Innovation, Research and development*
5. Importance of the protection of knowledge	*14. Human resources management*
6. Management strategy for problem solving	*15. Customer management*
7. Ability to develop new products	*16. Supplier management*

[2] For reasons of confidentiality, the names of the companies surveyed are ignored.

[3] Understood as the efficient (not only effective) compliance of the actors of the innovation system to create links and weave inter-institutional cooperative relations in order to create, adapt, manage, exchange and disseminate knowledge.

11. Planning and strategy	*17. Ability to enter new markets*
12. Production	*18. Improvement in the quality of products through the acquisition of quality certificates*

Source: self made.

For this purpose, the principal component method was used. In the revision of the system there was a reduction of the components in three factors that explained 75.020% of the variance (see Table 2), namely: 1) "*System of competition in the market*", which represents 54.75% of the variance explained; 2) "*Availability of professional human resources*", which represents 11.14% of the variance explained; and 3) "*Modality in which the company acquires learning*", which represents 9.12% of the variance explained, giving, a total cumulative percentage of 75.02% of the total variance explained. The maximum saturations for each item are also presented in Table 2.

The meanings of each of the variables are the following:

1. "*System of competitiveness in the market*": degree of effectiveness and ability of a company to face its competitors, to process information and to produce the product or service required by the market.
2. "*Availability of professional human resources*": considers the amount of human resources available in researchers, etc., to develop innovation, enhancing teamwork and a specific management style.
3. "*Modality in which the company acquires learning*" refers to the level of communication, collaboration and attitudes of organizations before the risks involved in innovation processes.
4. "*Decision-making capacity of subordinates*": considers the leadership capacity, enhancing teamwork and decision-making.
5. "*Importance of the protection of knowledge*": a systematic process that integrates and guides the activities that generate, search, document, protect, disseminate, share, use and maintain the knowledge, information, experience and expertise of an organization.
6. "*Management strategy for problem solving*": strategy that allows generating, searching, documenting, protecting, disseminating and solving problems within tge organization.
7. "*Ability to develop new products*": considers the creative capacity to develop new products
8. "Capacity to use information with suppliers": considers the capacity to generate, search, document, disseminate, share, use and maintain knowledge and information with suppliers.
9. "*Capacity to generate alliances with clients*": considers the capacity to generate disseminate, share, use and maintain knowledge and information with customers.
10. "*Punctuality of delivery*": considers the punctuality in time and form.
11. "*Planning and strategy*": activities that allows generating, searching and planning the creativity and innovation of products and processes.
12. "*Production*": strategy that allows generating, searching and planning productivity and the generation of new products.
13. "*Innovation, Research and Development*": a systematic process that integrates and guides the activities that generate, search, document, protect, disseminate, share, use and maintain the knowledge, information, experience and expertise of an organization, in order to increase its intellectual capital and increase its value.
14. "*Human resources management*": is the thinking part of any organization that helps determine and achieve the goals and objectives of the company.
15. "*Customer management*": degree of effectiveness and ability of a company to maintain and increase the number of customers.
16. "*Supplier management*": degree of effectiveness and capacity of a company to maintain and increase the number of suppliers.
17. "*Ability to enter new markets*": degree of effectiveness and capacity of a company to face its competitors, to process information and to produce the product or service required by the market, attract new customers and penetrate new markets.
18. "*Improvement in product quality through the acquisition of quality certificates*": quality application strategy to obtain a sustainable advantage over competitors and customers.

IV. RESULTS AND DISCUSSION

The State of Aguascalientes is the clearest example of planned industrial development. The conformation of industrial clusters has been one of the answers to be able to face the competition, seeking through the associativity higher levels of competitiveness and therefore of participation in the markets [24]. Based on the 2014 Economic Census conducted by the National Institute of Statistics, Geography and Informatics [25], in the State of Aguascalientes the microenterprise predominates in 94.42% of the total of companies, 4.49% corresponding to the small one, 0.85% to the median and only the 0.22% to the large

company; of which, 9.85% belongs to the industrial sector, 44.79% to the commercial sector, 43.55% to the service sector and in other sectors just 1.78%.

The Cluster of the Food Industry and its Technology (CIATAC, by its initials in Spanish) was created in May 2005 as a civil association composed of industrial food sector of the State of Aguascalientes, universities and the support of the State Government through the Secretariat of Economic development. Its purpose is to unite objectives among the private, academic and governmental sectors for the development and positioning of the regional food industry. With this, it is intended to generate a new development model based on the interrelation between the actors of the three sectors mentioned, whose main activity is the productive integration and development of business networks. In the same Table 2 of percentages of the total variance explained, a list of the eigenvalues of the variances-covariances matrix and the percentage of variance that each represents is given. In this case there are 3 eigenvalues greater than 1, so the procedure extracts 3 factors that manage to explain 75.02% of the variance of the original data.

For Pardo and Ruiz [26], the eigenvalues "express the amount of the total variance that is explained by each factor; and the explained variance percentages associated to each factor are obtained by dividing their corresponding eigenvalue by the sum of the eigenvalues. By default, as many factors are extracted as eigenvalues greater than 1 has the matrix analyzed".

Table 2. Total variance explained (Initial eigenvalues)

	Initial eigenvalues			Sum of saturations to the square of the extraction		
Compo-nents	Total	% of variance	% accumulated	Total	% of variance	% accumula-ted
1	7.118	54.757	54.757	7.118	54.757	54.757
2	1.449	11.144	65.900	1.449	11.144	65.900
3	1.186	9.120	75.020	1.186	9.120	75.020
4	0.822	6.329	81.348	-	-	-
5	0.651	5.009	86.357	-	-	-
6	0.517	3.978	90.335	-	-	-
7	0.356	2.738	93.073	-	-	-
8	0.259	1.992	95.065	-	-	-
9	0.225	1.729	96.794	-	-	-
10	0.186	1.428	98.221	-	-	-
11	0.102	0.785	99.006	-	-	-
12	0.066	0.507	99.513	-	-	-
13	0.063	0.487	100.000	-	-	-

Note: the numerals in the left column refer to the variables in Table 1. Source: Own elaboration.

Table 3 contains the communalities originally assigned to the variables (initial) and the communalities reproduced by the factorial solution (extraction). Pardo and Ruiz [26], mention that "the commonality of a variable is the proportion of its variance that can be explained by the obtained factorial model". Thus, when studying the communalities of extraction, it can be assessed which variables are worse explained by the model.

As shown in Table 3, the communalities are close to the unit, which guarantees a high degree of reliability in the results. The variable that shows the highest commonality is "*Management strategy for problem solving*", with 0.873, followed by the communalities "*System of competition in the market*", with 0.868, "*Capacity to use information with suppliers*", with .825 , and the lowest "*Human Resources Management*", with 0.543.

Table 3. Communalities

Variables	Initial	Extraction
1. System of competitiveness in the market	1.000	0.868
2. Availability of professional human resources	1.000	0.590
3. Modality in which the company acquires learning	1.000	0.809
4. Decision capacity of subordinates	1.000	0.741
5. Importance of the protection of knowledge	1.000	0.702
6. Management strategy for problem solving	1.000	0.873
7. Ability to develop new products	1.000	0.738
8. Ability to use information with suppliers	1.000	0.825
9. Ability to generate alliances with clients	1.000	0.803

10. Punctuality of delivery	1.000	0.759
11. Planning and strategy	1.000	0.784
12. Production	1.000	0.801
13. Innovation, Research and development	1.000	0.725
14.Human resources management	1.000	0.543
15. Customer management	1.000	0.743
16. Supplier management	1.000	0.816
17. Ability to enter new markets	1.000	0.741
18. Improvement in the quality of products through the acquisition of quality certificates	1.000	0.702

Extraction method: Principal Components Analysis. The rotation has converged in 5 iterations and in 3 extracted components. Source: self made.

When considering the low predictive power of a factorial analysis for small samples, it must be analyzed that there is enough sample adequacy to validate the results obtained by this type of analysis [27], so it was determined that the sample adequacy index Kaiser -Meyer-Olkin was appropriate, with a value of .815, and the Bartlett sphericity test was significantly high, with a p-value of .000 (see Table 4).

As mentioned by Hair *et al*. [23], if the critical level (i.e. the level of significance) is greater than 0.05, we cannot reject the sphericity hypothesis and, consequently, we cannot assure that the factorial model is adequate to explain the data.

In this way, it can be concluded that the factor 1, "System of competition in the market", which explains the 54.75% of the variance and that integrates the variables "Availability of professional human resources", "Modality in which the company acquires learning", "Decision-making capacity of subordinates", "Importance of knowledge protection", "Management strategy for problem solving", "Capacity to use information with suppliers", "Capacity to generate alliances with clients", is the factor which has more weight in the model.

Table 4. Sample adequacy analysis KMO

Sampling adaptation measure of Kaiser_Meyer-Olkin		0.815
Bartlett's sphericity test	Approximate Chi-square	288.458
	Degrees of freedom	78
	Sig.	.000

Source: self made.

The relative youth of the companies that carry out scientific and technological research within the food cluster in Aguascalientes influences the weakness of their position within the state, by the precariousness of the economic resources allocated to them and the little relevance that science and technology have in the state culture. In the food cluster, the modernization of successful local companies has been achieved through an industrial adjustment that occurred preferably through process innovations and organizational changes. In fact, the research and development activities are mainly oriented to the modernization of the production processes, to improvements in the organization and to the quality of the products. On the other hand, the learning and the virtuous synergies generated by the entanglements among the companies studied are almost non-existent.

The weak integration and articulation with the set of industrial activities creates a vicious circle, whose characteristics, oriented to innovative capacities, refer to the mere adaptation of technologies developed at an international level. Thus, the potential for appropriation of technological and innovative knowledge by subsectors that depend on external capital is very limited, since it is subordinated almost exclusively to the sources of each sector, where intersectoral cooperation is limited, which also limits the networks of internal knowledge, the innovative capacity of companies and weakens the functioning of the local productive system. The industrial policies of the Government of the State of Aguascalientes have been focused on the development of the competitiveness of the state productive plant and the formation of *clusters* has been one of the strategies applied for that purpose. Despite these efforts, in fact most of the beneficiaries of public policy incentives are bigger and transnational companies.

V. CONCLUSIONS

1. The objective of the work was fulfilled, since it was detected that there is a relationship between the variables, but that the "endogenous" way of working of the firms is far from providing robust links with other companies, which hinders their degree of integration and development. The differentiating factors of the agents' innovative capacity are the training efforts, the proportion of engineers in the development teams and the degree of scope of their activities; these factors, together with the lack of technological cooperation, show that innovation processes are fundamentally based on the individual efforts of companies, as mentioned in their study by Yoguel and

Boscherini [12], categorizing the environment as negative by the proportion of engineers and technicians in the new product development team and the degree of formal and informal technological cooperation within the companies.

2. With respect to the answer to another basic questioning of the research (the relationship that exists between the companies that make up the food cluster of Aguascalientes, in terms of how they work and how they are linked, directed towards building capacity in innovation), it can be said that although there is a positive relationship, this relationship is precarious, since in the best of cases, asymmetries of information and adaptation or renewal of technologies are detected, and the development of *ad hoc* basic research is not constructed for companies, or where appropriate, this development is very limited.

3. The response to the initial hypothesis was validated by establishing a positive significant correlation between the variables; however, there is also an unequal behavior among the companies studied.

4. The most significant variables within the principal component method are three, which show the maximum saturations, being in order of importance the variables: "System of competitiveness in the market", "Availability of professional human resources", "Modality in which the company acquires learning", which have more weight in the model.

5. The circulation of knowledge from informal practices of cooperation between agents and institutions is a vital factor that favors the generation of skills. In addition, there are other factors that are also decisive to differentiate various levels of innovative capacity, such as: technological cooperation, quality assurance and training efforts, relationships that are still weak in the food cluster companies of Aguascalientes.

6. An implicit objective of the present investigation was to contribute to the study of innovation capacities in a specific entity, such as the State of Aguascalientes; to gain validity, the study should be replicated in the different states of the Mexican Republic.

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