Innovation and Competitiveness in SMEs: The Local Experience in San Luis Potosi, Mexico

M.A. Mario Alberto Martínez Rojas
Polytechnic University of San Luis Potosí
Mexico

M.B.A. Gloria Cristina Palos Cerda
Polytechnic University of San Luis Potosí
Mexico

PhD. José Guadalupe Vargas Hernández
CUCEA University of Guadalajara.

Abstract

At this time, small and medium enterprises represent the national productive force. They are the sustained at the generation of self-employment in the Mexican business. Determine factors are directly related to the generation of opportunities that maximize performance and level of participation in the local and international level. This paper analyzes the relationship between innovation and competitiveness through the operational activities measurement in small and mediums enterprises (SMEs) in San Luis Potosi, Mexico. The theoretical framework is based on literature review, where it encompasses innovation and competitiveness terminology and the connection within SMEs. Further, it ascertains the SMEs economic and occupational work dominance taking place in commerce, services and manufacturing business activity. Finally, the research model focuses a quantitative paradigm to measure the competitiveness and innovation as variables. The results show, for a sample of 65 SMEs, that there is a direct relationship between innovation activities and competitiveness replicated in the operations of the companies studied in the city of San Luis Potosi, Mexico.

Key words: innovation, competitiveness, SMEs, relationship, Mexico.

1.Introduction

Innovation is the result of a complex process of existing thoughts that leads to new ideas within the same procedure, either in a form of products, services or production processes. Regarding competitiveness, nowadays it is critical to determine endogenous and dynamic comparative advantages. Undoubtedly, both terms focus on increasing productivity and developing technology by reducing costs or depreciation. Given the above, this paper is traduced on variables that measure their relationship and interaction within SMEs of San Luis Potosi, Mexico.

2. Theoretical Framework

A. Terminology of innovation and innovation management model.

In a changing and competitive environment, innovation is a key factor for any business survival. It encompasses a wide research field that analysis multiple aspects. The different terms to refer to it, explain the complexity of the concept. Below are shown contributions to the field of global innovation study in chronological order:

"Innovation is a complex process that brings ideas to market in the form of new or improved products or services. This process consists of two parts, which are not necessarily sequential to each other, although they are linked paths between them in a back and forth direction. One it is specialized on the known-how and the other it is devoted primarily to the application as a process, a product or a service. In both cases, they incorporate new advantages to the market"

(Castro, E., & Fernandez de Lucio, I., 2001).

"Innovation is toproduce, to assimilate and successfully to exploit the novelty in the economic and social areas"
(Comunicación de la Comisión al Consejo, al Parlamento Europeo, al Comité Económico y Social Europeo y al Comité de las Regiones, 2003).

"It is the introduction of a new or significantly improved product (good or service), a process, a new marketing method or a new organizational method in the internal business practices."

(Oslo Manual, OECD, 2005).

The process of innovation comes from different sources and it can be classified according to a range of criteria. Referring to product innovation, it can be applied to a good or service, it involves changes in working methods or production functions. Innovation is not limited only to the product or its manufacturing process, but it involves many other aspects that affect the company decision-making. Table 1, presents the multifaceted concept depending the direction applied.

Table1: Innovation as a multifaceted concept.

Depending on the object - Product - Process	Depending of their relevance. - Incremental Radical.
Depending on the field: - Technology. - Organizational. - Marketing.	Depending on their origin: - R & D. - Incorporation. - Imitation. - Experience.

Source: Ministry of Industry, Tourism and Trade, Spain. (2005).

On account of it, the kind of innovation that is practiced in the business will have an important connotation for their future development. Basically, depending on its object, its relevance, its scope or origin, the innovation is able to route human, financial or material resources to increase the value of new or existing knowledge. As a result, it can be seen that innovation brings significant increase in financial ratios of the companies that boost productivity. Since, it is important to consider the results of the innovation process, it should be considered as a dynamic process feed through learning experiences. Therefore, the central issues in companies should be: Innovation Management.

The Agencia Navarra de Innovación in Spain (2008) states that innovation management is the organization and the management of human and financial resources, in order to increase the creation of new knowledge, the generation of techniques to obtain new products, processes and services or the improvement of existing ones. On top of that, Osterwalder (2004) defines business model from being "a conceptual tool and a set of elements stoutly linked, to express the logic by which a company tries to earn money creating and delivering value to customer segments. The architecture of the firm, as well as its partnership network, they serve for creating and delivering value. They are the orderliness to generate profitable and sustainable revenues ". Through innovation management, content business model is managed through strategic thinking stimulated growth opportunities and sustained benefits.

B. Competitiveness and the development at micro level.

Due to a combination of situational factors and with the result of nowadays global business framework, uncompetitive enterprises tend to disappear from the business scene. As a result, it draws out a disadvantage positioning compared with other business units embedded in the same environment. Next are presented definitions concerning competitiveness terminology.

"Competitiveness is the ability of companies, industries (sectors), regions, nations or supranational regions to generate, while it is exposed to international competition, high income levels (relatives) and employment on a sustainable basis."

Organization for Economic Co-operation and Development (1996)

"Competitiveness is the product of a complex and dynamic interaction partnership between the government, enterprises, intermediary institutions and society organizational capacity... The competitiveness of the economy relies on goal-directed actions, articulated in four levels system (macro, goal, micro and meso) and it is based on a multidimensional driving concept".

Esser, Hillebrand, Messner & Meyer (1995).

For some, competitiveness is the result of the macroeconomic environment in which operates companies and industries, that are affected by exchange rates and the level of government deficits.

Others argue that competitiveness is achieved basically on the relative abundance of resources and low costs of manpower availability. There are others who relate it to the natural resources of the country or the type of government policies. (Van Der Horst, 2006).

Taking into account the mentioned above, competitiveness highlights arises in two parallel fronts, firstly: from the macro (government). Competitiveness depends on the performance of small and medium enterprises, where they have turned into the feed of the economy of a country. In the case of the European Union, should outperform their competitors in terms of research and technology innovation, information and communication, entrepreneurship, competition, education and training: competitiveness therefore isa main political priority of the European Union. (European Commission: 2013). To explain the macroeconomic behavior, one of the leading exponents of competitive forces analysis was held by Michael Porter. Its model explicitly mentions the existence of five forces that determine the long-term consequences profitability of an industry or country. (Porter, 1996), (Porter, 2008).The model outlines visibly the indispensable factors to rival and identify strategic innovations that help to optimize the profitability of a particular industry sector. The idea is clear: improve the possibilities of finding a strategic innovation.

The second parallel front is defined by the microeconomic vision (enterprise). Productive sectors are self-imposed to increase efficiency as organizational purposes, hence it is conceived a clear level of performance above their homonyms. However, there are different perspectives on the determinants factors to describe the level of competitiveness in company, where they might be probably set as endogenous and exogenous factors. The feasibility of a business to achieve and maintain their competitiveness levels should be focus on: the examination of internal and external influences on the industry or sector which it belongs as well as the region-country in which it is located. (Cabrera & Lopez, 2011). The Competitiveness Studies Center of Mexico (Abdel &Romo, 2005) states that the competitiveness of the company it is derived from the competitive advantage that it has in its production and organization methods. Referring to the underlying factors of the company competitiveness, the Center notes the following:

a) Research and development;
b) Rate of workers;
c) Cooperation with other companies; and
d) Manufacturing and production systems

Competitiveness is established as a necessary condition for a company that attempts to being inserted and maintained in international markets. Unquestionably, it is a challenge for SMEs stand on the renovation of their traditional business models by international strategies based on competitive prices. The strategy of insertion in global markets, however, should not lose the sight on it role on the economy at micro level. Therefore, the strategy oriented in the external sector should promote fair space to local markets and develop equitably benefits among all players. (Rojas & Sepúlveda, 2000).

C. The economic participation of SMEs in Mexico and San Luis Potosi.

Until March 1999, the stratification of the companies was differentiated only by the total people employed. Table 2 shows the stratification considered for this investigation.

Table 2: Stratification Company Scale

People Employed		
0	to	2
3	to	5
6	to	10
11	to	15
16	to	20
21	to	30
31	to	50
51	to	100
101	to	250
251	to	500
501	to	1000
1001	and	more

Source: Adapted from INEGI, 2009.

According to Economic Census 2009, in Mexico were 3, 724, 019 economic units from the private and public sector and employed 20, 116, 834 people. In view of the national productive system classification, it has been considered three economic activities: manufacturing, commerce and services. It is due to the highest percentage represented on economic units and the total people employed.

Table 3: Economic units and total people employed in of private and public sector by economic activity

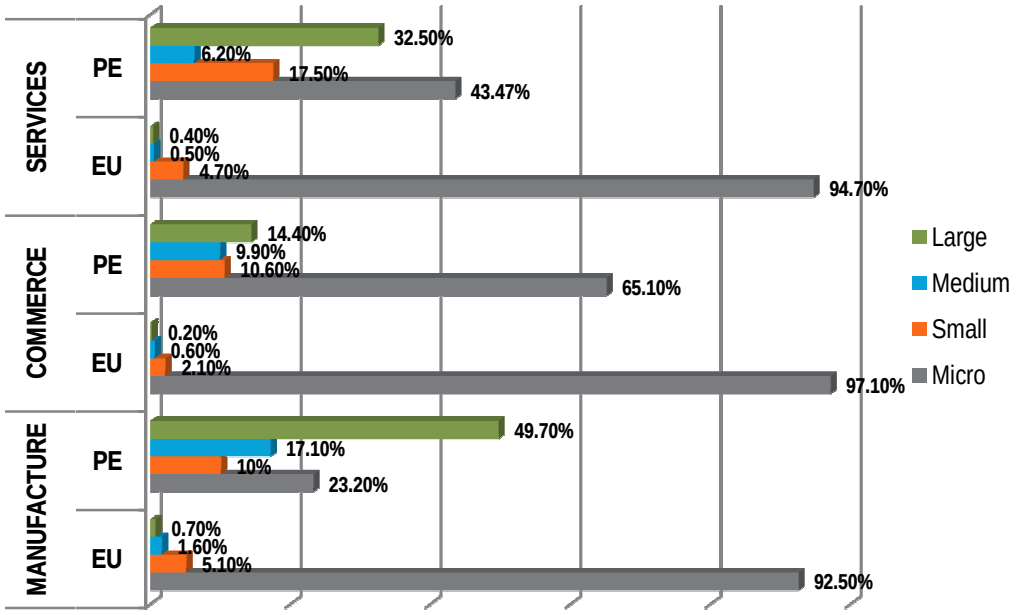
Economic Activity.	Economic Units		Total People Employed.	
	Absolute	%	Absolute	%
Total (national)**	3 724 019	100.0	20 116 834	100.0
Services	1 367 287	36.7	7 340 216	36.5
Commerce	1 858 550	49.9	6 134 758	30.5
Manufacturing	436 851	11.7	4 661 062	23.2
Transportation, posts and warehousing.	17 705	0.5	718 062	3.6
Construction.	18 637	0.5	704 640	3.5
Electricity.	2 589	0.1	235 688	1.2
Fishing and agriculture.	19 443	0.5	180 083	0.9
Mining.	2 957	0.1	142 325	0.7

Note: The table presents only the represented activities base on the total people employed.

Source: Adapted from INEGI, 2009

In Mexico, manufacturing sector generated 44.3% of the national gross production total. It has 11.7% from the economic units and employed 23.2% people. SMEs accounted more than 90% in economic units, although in proportion few large companies generate large production volumes.(Graphic 1).The commerce economic units in the period 2003-2008 showed a considerable growth. It turned 277, 963 from 269, 934. Regarding the people employed on same period, it increased of 22.8%. One of two economic units (49.9%) and three of ten (30.5%) were devoted to commerce. However, its contribution to the total gross production was only 9.8%. (INEGI: 2009). Commerce activity shows that more of 97% are SMEs and it has more than 70% of total people employed. Finally, in the case of services, economic units accounted 36.7% from the national total production, and total people employed registered 36.5%. SMEs registered more of 94.7% in economic units en employed more than 50% of the people labor for it.

Graphic 1: Main characteristics of business establishments by productive sector



PE: People employed. **EU:** Economic units.
Source: Adapted from INEGI, 2009.

D. Economic framework of companies in San Luis Potosí, Mexico.

The universe of economic units (urban and rural areas) was distributed geographically in highest proportion in: Mexico City and Veracruz with a share of 11.4, 8.1 and 7.1% respectively. In regard to people employed, 14.9% was found in Distrito Federal, where it had the highest concentration in relation to their economic units (10 employees per unit). San Luis Potosi concentrating figure 2.1% of employed persons and 2.4% compared to the national economic units.(INEGI: 2009). Table 4 shows the national productive regions classification into five regions according the territorial distribution (Development National Plan, 2007-2012):

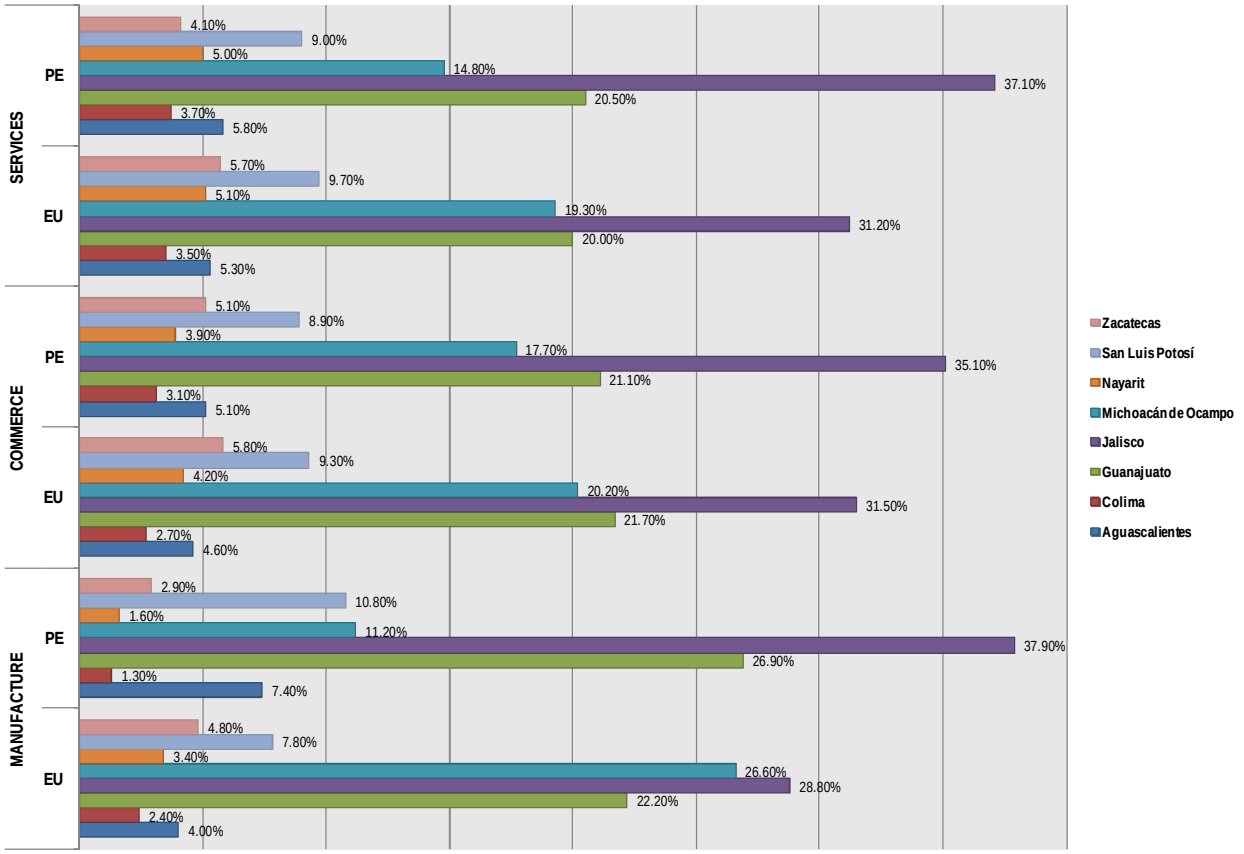
Table 4: Classification of the National Productive Regions in Mexico

South east region.	Central west region.	Central region.	North east region.	Northwest region.
Campeche, Chiapas, Guerrero, Oaxaca, Quintana Roo, Tabasco, Veracruz y Yucatán.	Aguascalientes, Colima, Guanajuato, Jalisco, Michoacán, Nayarit, Querétaro, San Luis Potosí y Zacatecas.	Distrito Federal, Hidalgo, México, Morelos, Puebla y Tlaxcala.	Coahuila de Zaragoza, Durango, Nuevo León y Tamaulipas.	Baja California, Baja California Sur, Chihuahua, Sinaloa y Sonora.

Source: Adapted from INEGI, 2011.

Focusing on the region was the study was conducted San Luis Potosi is located at the central west region. The manufacturing sector at central west concentrated91.2%economic units of micro business (0-10 employees). Total people employed and total gross production was concentrated in large companies (over 251 people) with 40.7 and 74.0%, respectively. San Luis Potosi concentrates 7.8% of economic units, 10.8% of the total people employed and 13.8% of total gross production. (Graphic 2). About commerce activity, at central west region operated 22.8% of economic units and employed the 22.4% from the total people. San Luis Potosi accounts 9.3% of the total economic units where 8.2% are large, 10% are medium, 9.4% and 9.3% are small are micro.

Graphic 2: Main characteristics of business establishments in Central West Region



PE: People employed. **EU:** Economic units.
Source: Adapted from INEGI, 2009.

Regarding services activities at central west, micro enterprises accounted for the largest number of economic units and the total employed persons with 95.2% and 54.5%, respectively. Regarding the revenues, they ranked in second place with 29.5%. Small businesses ranked third place in terms of people employed and revenues with 18.9% and 18.6%, respectively. Large companies (0.3% of economic units) contributed the highest percentage of incomes to the region with 43.5% and ranked second place in terms of job creation with 20.5%.

In the state of San Luis Potosi, the main economic activities are retail commerce (48.8%), manufacturing (9.9%), accommodation and food preparation (10.3%) and other services (12.9 %).Regarding those activities, to the number of people employed were retail trade (25.9%) and manufacturing (28.2%).

Table 5: Main sectors by economic units and people employed at San Luis Potosi, Mexico

		Economic Units	Employed People
11	Fisheries and aquaculture animals.	0%	0.1%
21	Mining.	0.2%	0.8%
22	Electricity.	0.1%	1.2%
23	Construction.	0.6%	7.3%
31-33	Manufacturing Industries.	9.9%	28.2%
43	Wholesale trade.	3%	5.7%
46	Retail trade.	48.8%	25.9%
48-49	Transportation, posts and warehousing.	2.8%	3.4%
52	Financial services and insurances.	0.3%	0.3%
53	Real estate and renting services.	2%	1.5%
54	Professional, scientific and technical services.	2.3%	2.2%
72	Accommodation and food preparation.	10.3%	6.9%
81	Other services (except the government).	12.9%	5.8%

NOTE: Organization according the North American Industrial Classification System (NAICS)
Source: Adapted from INEGI, 2011.

Within the state of San Luis Potosi, there is a significant difference between municipalities with a largest number of economic participation. Basically the municipalities of Ciudad Valles, the capital of San Luis Potosí and Soledad de Graciano Sánchez hosts the largest number of economic units. It is themselves who have the largest number of people employed persons.

3. Scope, objectives and methodology

Currently, SMEs represent the national productive infrastructures that are the foundation of the financial resources generation in the Mexican businesses. Around the SMEs, there are factors currently related to the generation of opportunities that maximize their performance and level of participation at local and international level. With the above, it is considered relevant to study these factors. For this research they become the variables of: innovation and competitiveness.

This article attempts to answer the next research questions:

- What is the relationship between the variable components of innovation in relation to the variable components of the competitiveness of SMEs in the capital of San Luis Potosi?

This main objective is to determine the relationship between innovation and competitiveness in small and medium enterprises in the capital of the state of San Luis Potosi.

For the present study were measured 65 SMEs at the capital of San Luis Potosi. It was conducted a qualitative booked about the innovation and competitiveness activities. In order to measure the magnitude of the variables, it was required to divide them into specific components. Next the data collection instrument was design. In the case of dependent variables, it was designed as follows:

INNOVATION. OECD (2005), Hadjimanolis (2000)

- Innovation in products and processes
- Knowledge innovation.
- Organizational innovation

COMPETITIVENESS. Porter (1980,) Afuah (2009)

- Generic factors (place)
- Costs.
- Generic factors (product, price).
- Suppliers.
- Generic factors (promotion).
- Competitive advantage.

4. Analysis of results

The preliminary Cronbach's alpha sample it is given in table 6 as:

Table 6.

Abstract of data processed.

		N	%
Cases	Valid	59	90.8
	Excluded[a]	6	9.2
	Total	65	100.0

a. Listwise deletion based on all variables in the procedure.

Source: Own elaboration.

It can be ensured that within the sample there is preliminary reliability of 90.8%. (Table 7) Reliability of the two halves of the preliminary sample confirms the preliminary feasibility study sample.

Table 7.

Abstract of data processed.

		N	%
Cases	Valid	59	90.8
	Excluded[a]	6	9.2
	Total	65	100.0

a. Listwise deletion based on all variables in the procedure.

Source: Own elaboration.

Below are shown the tables that correlate the variables analyzed. They are used to define the relationships and influencing factors among them and they will define the empirical evidence of this research. If the correlation is significant at the 0.01 level, it will be indicated as (**), while if the correlation is significant at the 0.05 level, it will be indicated as (*).(Table 8 and 9).

Table 8.

Pearson Correlation Variable: Innovation.

	Prod/Proc	**Knowledge**	**Organization**
Prod/Proc	1		
Knwoledge.	.859**	1	
Organization	.633**	.713**	1

Source: Own elaboration

Table 9.

Pearson Correlation: dependent variable vs., dependent variable.

	Competitiveness
Marketing.	.704**
Production.	.625**
Human Capital.	.792**
Public Politics.	.642**
Innovation.	.507**

Source: Own elaboration

The regression analysis allows identifying the lineal relationship between the independent and dependant variables. Table 10 and 11 show the following table shows the level of statistical significance.

Table 10.
Variable of Competitiveness.

	Sum of squares	gl	RMS	F	**Sig.**
Regression	35.050	6	7.010	27.735	**.000**
Residuary	10.363	59	.253		
Total	45.413	65			

Source: Own elaboration

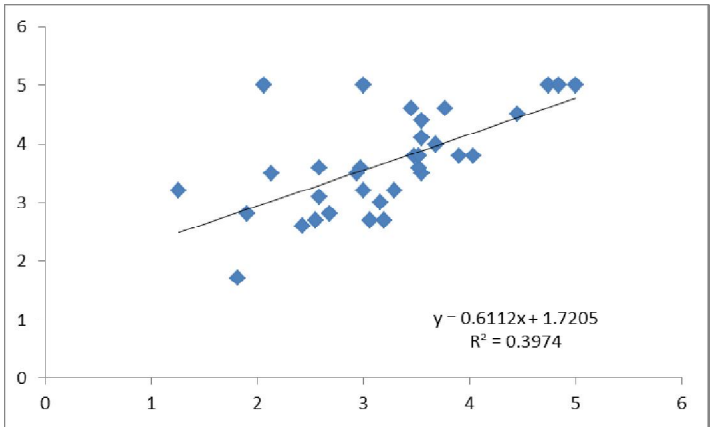
Table 11.
Regression Model Summary for Competitiveness.

R	R squared.	R squared corrected.	Standard error of the estimate	Durbin-Watson
.879	**.772**	.744	.5027386	1.672

Source: Own elaboration.

Finally, graphic 3 clearly state the direct relationship between innovation and competitiveness. It can be appreciated the positive relationship, it means that at the time a company has innovation activities, competitiveness become higher and higher.

Graphic 3.
Relationship between innovation and competitiveness.



Source: Ownelaboration.

5.Conclusions

The article analyzed the relationship between innovation and competitiveness through the measurement of operational activities within SMEs in San Luis Potosi, Mexico. To determine the theoretical concepts and met explanatory theories of innovation and competitiveness, it was presented a constructed framework. Subsequently, the statistically SMEs domain was described in economic units and people employed standards of SMEs in Mexico and San Luis Potosi at the manufactures, commerce and services sectors. 65 SMEs were measured under a qualitative record of innovation and competitiveness activities within their daily operations. It can be assured that within the sample there is preliminary reliability of 90.8%. Regression analysis was aim to identify the linear relationship between the independent variables and a dependent variable (competitiveness) that showed a high level of significance. Returning to the key research question is posed: What is the relationship between the variable components of innovation in relation to the variable components of the competitiveness of SMEs in the capital of San Luis Potosi? There is a direct relationship innovation on competitiveness where we see that is positive and that when a company has innovation activities is higher competitiveness.

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