
THE RELATIONSHIP OF PRIVATE COST (CPR) AS A MEASURE OF RURAL COMPETITIVENESS

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ABSTRACT

The small farmers that operate in a production unit environment are linked in some way to the market where they place their generated products after covering their consumption, obtaining monetary income that allows them to acquire goods and services that they do not produce in their production unit. As this link strengthens, small producers can increase their income and therefore have better conditions to get out of poverty and marginalization. One way to measure this link is through the competitiveness index called Private Cost Ratio (CPR). The objective of this work was to use this indicator as a measure of the competitiveness of marginalized production units, in order to identify their positioning on the competitiveness scale and explain the reasons for such situation. Information was collected from 60 rural production units of the municipality of San Jacinto Tlacotepec, Oaxaca, Mexico through a questionnaire designed *expresado* and the procedure called income analysis was applied to obtain intermediate indicators such as Net Value Added and Cost of Internal Factors, with both Indicators CPR was obtained for each production unit. The results indicated that it is feasible to use CPR as a measure of competitiveness in rural production units and its greatest utility is that it allowed them to be classified into three categories: non-competitive, competitive and competitive. The main challenge in terms of policy towards this sector is to help UPRs in the process of competitiveness that meant 82% of the production units studied, to climb to the category of competitiveness that meant only 6%, which means that Achieve a positive Net Added Value higher than the Cost of the Internal Factors and this is only achieved by strengthening the market link, in parallel the inverse relationship between the sales and competitiveness variables was confirmed, so it was confirmed that the market is the only way to achieve increased competitiveness.

Keywords: Private Cost Ratio , Marginalization, Poverty, Competitiveness

1. INTRODUCTION

Small rural producers who practice eminently small-scale family farming account for 80% of farms in Latin America (FAO, 2014). Most of these farmers have a weak commercial connection and fail to add or capture the value of their products; they are also characterized by

having limited edaphic and water resources, with a workforce to some extent abundant but not trained, with high risk aversion; They produce primarily for subsistence with little marketable surplus due to low production levels and in many cases, they are net food buyers. Other inherent characteristics are the marked seasonality of production and under control of product quality, which together forms a limitation to enter into formal markets, translating this into low profitability and consequently low monetary income from the sale of their products. Placing them in a situation of marginality and poverty (Arias, 2014). These farmers operate in the surroundings of the Rural Production Unit (UPR) whose concept assumed here is the one proposed by Cuanalo (2003) “The production unit is currently understood as a group of human beings and their means of production, organized socially, with the purpose of producing satisfiers for themselves and for their exchange in the market, having the particularity of having a single identity that defines the times and the use of available labor, land and capital resources”.

As part of the intrinsic dynamics of operation, there is a necessary link between the rural production units and the market, which plays a fundamental role in its development, since this link and its magnitude determines the level of monetary income, the level of consumption and therefore of the welfare of its members. The stronger the link to the market, the production unit will be in more favorable conditions to achieve its development (Rodríguez et al., 2014; Rodríguez et al., 2015); What is the way to strengthen this link? Arias (2014) points out that this link largely explains why there are increases in productivity, this being a key factor in agricultural development. The improvement of productivity, especially in the poor productive sectors, ensures the sustainability of the broad-spectrum transforming processes. The increase in market production contributes to stabilize food prices, encourages investment and creates monetary surpluses that reinvested in rural economies generate multiplier effects. The increase in productivity and the growing insertion of poor producers in the markets is a synergistic process that can be invigorated with proactive catalytic actions.

According to Rodríguez et al., (2016), the link to the market by the peasants has been presented since the very emergence of the capitalist mode of production, they affirm that Karl Marx, Alexander V. Chayanov, and Roger have long since Bartra, classic peasants scholars, pointed out that peasant production units are linked to some extent to the market. The peasant economy by definition is a mercantile economy, in which the process occurs:

M - D - M'

Where M are agricultural, livestock, forestry, handicraft products, etc., that the farmer destines to the market after covering his consumption reason why they become merchandise; D is money that you receive in exchange for M and M' are merchandise that you acquire in the market that you do not produce in your unit. This process constitutes the means of linking between the production unit and the value chain, that is, between the peasant economy and the global economy. Because a greater participation in the market allows to increase D, and therefore acquire more consumer goods M', this process is relevant in the transformation of peasant family agriculture since the linkage to the market is the way by which the small Producer can diversify their consumption and meet their expectations, for this a necessary condition is to participate more aggressively in the market by placing more M. In terms of fighting poverty, governments

design and implement various policy measures that in common pursue the development of small rural producers, favor the achievement of higher incomes and better welfare stages of small rural producers. In essence, most policies ultimately seek greater market insertion, so in terms of agricultural policy it is important to measure the levels of market linkage of rural production units when implementing the various support programs to rural development because this information will indicate the effectiveness of these programs. But how to measure the level of linkage of rural production units to the market and their evolution over time?

Competitiveness is a concept used to describe the positioning of a productive unit (company), in a defined market, through attention to one or several specific demands known as market niches (Sekine and Hisano, 2009). The competitiveness of a company in general, but with an emphasis on the agricultural company, is determined by its ability to remain in the market (Porter, 1990; Porter, 2008; González, 2009), a situation that is closely related, on the one hand, with the efficiency in the production of the good or service, which in turn is determined by the good use of its land, labor and capital production factors; and on the other, that the good or service is positioned in the preference and taste of consumers, with rationally full satisfaction of their consumption expectations, in such a way that motivates their purchase. The specific needs of the consumer materialize in the concept of quality. Peri (2006) defines quality in the agri-food field as the requirements necessary to meet the needs and expectations of the consumer. Likewise, Olsen (2002) and Espejel et al., (2007) have demonstrated a clear relationship between the perceived quality of products (agrifood) with satisfaction, loyalty and intention to purchase. These concepts that lie behind the concept of competitiveness have allowed researchers to develop both theories of agrifood marketing (Souza and Ventura, 2001; Tendero and Bernabéu, 2005; Sanjuán et al., 2006). This need to remain in the market, that is, to be competitive, encourages companies to implement innovations of the product, processes, marketing and/or organization and this in turn leads to the creation and / or appropriation of knowledge. (OECD, 2005; Cadena et al., 2018; Bonales et al., 2015). The concept of competitiveness is linked to the market and is favored by technological innovation, in this regard Rodríguez et al., (2015) highlight the power of sales as a mechanism to increase market linkage and therefore of income in a community Poor from Oaxaca, Mexico, demonstrates how innovation in tomato *Lycopersicon solanum* (L) production allowed the production units to have a greater market positioning.

Traditionally, competitiveness has been studied at the country level or at best in aggregate form of sectors of an economy (groups of companies) or agri-food chains at the macroeconomic level such as the study of mango competitiveness in Mexico Ramón-Canul et al., (2016) or the study of the competitiveness of Mexican strawberry in the world market, conducted by Ramírez-Padrón et al., (2016). However, there are few studies of competitiveness at the micro level, that is, at the company level, a study in that tenor was made by Magaña (2014) in the case of micro, small and medium-sized lemon companies; and there is still an imminent shortage of competitiveness studies of rural production units. In this regard, it is worth highlighting the studies by Reguera (2009) who analyzes the role of rural companies in economic development from a historiographic point of view. One of the factors that has probably influenced so that competitiveness in rural areas is not addressed, refers to the conception of origin of the term competitiveness that seems to be more easily applied to industries and not to the rural primary

sector; however, due to the social importance of this sector, especially for Latin American countries such as Mexico, where poverty prevails despite the fact that governments make efforts to reverse it; It is necessary to study the competitiveness of small rural producers, for the simple fact that there is an undeniable link between the production units and the market and this is the main route, but the only way out of poverty.

At the macro level, several authors agree that the factors that determine competitiveness are essentially inherent in the economic agents themselves and in the countries. Porter (1990) defines four fundamental aspects that determine the competitiveness of nations, namely the cost of labor as the main factor of production, the interest rate, the exchange rate and the presence of economies of scale. From a holistic point of view Arboleda (2016) talks about systemic competitiveness, which is determined by several factors that interact with each other, at the target level (social formation of structures for the modernization of the economy, patterns of social organization, open systems and receptive to learning); at the macro level (monetary policy, fiscal policy, commercial policy, etc.); at the micro level (management capacity, business strategies, innovation management, integration in technological cooperation networks, etc.); target level (sociocultural factors, scale of values, etc.). At this macro level, competitiveness is commonly measured through indices, which reflect the competitive position through a ranking through which differences between economies are marked according to industry sectors and company size. There are several ways and methods to measure competitiveness at the macro level, but this is not the case at the micro level and if we talk about the rural sector we would perhaps drastically point out that it is not measured and assumed in the academic environment even, as valid, to relate, for example, Cost and profitability studies with competitiveness, which is not necessarily correct.

Therefore, the objective of this work was to propose a methodological alternative to study and analyze the competitiveness of marginalized rural production units based on the Private Cost Ratio (CPR) as a way to determine the level of linkage to the market, as well how to validate its applicability considering the social and economic particularities of the current rural context where poverty and marginalization predominate.

2. METHODOLOGY

Conceptual theoretical framework. Competitiveness is a concept that has been derived from the theory of comparative advantage previously developed by classical economists, such as David Ricardo (Rosa, 2012). The empirical analysis of the comparative advantage in the rural environment indicates that any merchandise or marketable service (with the potential to be exported or imported) has an international price that represents its opportunity cost. The key issue of comparative advantage analysis is whether or not it is cheaper for a country to import the merchandise than to produce it. If it is not, there will be a comparative advantage in the production of that good. In order to make this estimate, it is necessary to make each of the effects of the policies applied independent and compare the budgets allocated using world prices, adjusted for transport prices. The cost analysis of internal factors (non-marketable) implies taking it further, comparing the cost, in currencies, of internal factors, used in alternative activities.

The original approach to comparative advantage was to find the answer to the question: would certain long-term agribusinesses compete in international markets if all public aid in the form of taxes, subsidies and exchange rate changes were completely eliminated? Emphasis is placed on the use of the verb in conditional tense because the elimination of all public aids and interventions is not considered a probable event. However, it is very useful information when making long-term decisions about the allocation of public resources and knowing the ability of different economic activities to compete internationally. From this perspective, the decisions regarding the production taken by the farmers are based on the expectations of prices, yields and needs of factors for the different productive activities, as well as other economic, biological and social considerations. Explicitly or implicitly, farmers evaluate the productivity of the different activities, using prices at the exit position of the farm. Subsidies, taxes and changes caused by exchange rates, often significantly affect the prices received by the farmer and therefore their level of competitiveness. The empirical analysis of the comparative advantage implies eliminating these effects of the policies and calculating the profitability that different factors may have for the nation.

In the rural sector, there are few contributions to the study of competitiveness, in this regard it is important the contribution of Salcedo (2007) who takes up the method of the Policy Analysis Matrix (PAM) as a tool of computational quantitative analysis that makes it possible to speed up the calculations of certain indicators of competitiveness of agricultural systems to some extent complex. Subsequently Naylor and Gotsch (2005) contributed to the study of rural competitiveness through an application manual focused on agricultural systems for small farmers.

Several competitiveness studies have been carried out applying the PAM methodology, perhaps the most representative are those of, Puente (1995) who conducted a study in Mexico of the main crops determining their comparative advantage, which served as a basis for defining policies of productive reconversion in Mexico, Padilla (1992), studied extensively the agricultural sector of Sinaloa, Mexico and in other countries highlights the studies of Charpantier and Mora (1999) studied the competitiveness of small onion producers in Costa Rica, Jiménez and Quiroz (1999) studied the competitiveness of potato producers in Costa Rica. More recent cases are those carried out by Rodríguez et al., (2013); Rodríguez et al., (2016) and Góngora et al., (2019) who studied the competitiveness of family production units in Oaxaca and Yucatan, Mexico, respectively using CPR.

It is necessary to highlight at least two factors that make it necessary to reconsider the scope of the competitiveness studies based on the comparative advantages approach hitherto predominant:

a) An environment of globalization whose main characteristic has been the increasing liberalization of economies and the gradual reduction of protectionist policies, facts that have favored the greater mobility of factors as one of its main characteristics.

b) The persistence of a lagged rural sector in Latin America as in southern Mexico that has shown difficulty in inserting itself in the dynamics of growth, which has favored debate

regarding its role in the national economy. This sector, with few exceptions, has limited export potential, its production destined for the market is very small and has few production factors such as land and capital. From this point of view Salcedo (2007) points out the current concern about the future role that family farming can play in the new globalized agriculture. Given the greater international competition, what are the concrete options for the small family producer?

At the level of rural production units, with emphasis on small farms, the competitiveness analysis can combine two components of study called the income analysis that includes variables coinciding with the methodology set out in the PAM (Salcedo, 2007) and the analysis of investment at the production unit level with variables that coincide with the evaluation of agricultural projects that have traditionally been applied. The income analysis deals with a year of current operation of the UPR, while the investment analysis deals with the development of the UPR in the course of the duration of an investment in production. The variables can be measured annually and lead to preliminary competitiveness indicators such as Net Value Added (NPV). The methodology comprises the following phases: Item It is necessary to highlight at least two factors that make it necessary to reconsider the scope of the competitiveness studies based on the comparative advantages approach hitherto predominant:

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UPR Background. In this phase, the situation of the UPR in terms of land use and availability, livestock inventory, labor availability, quantification of available capital in assets, liabilities and net assets is investigated. It includes the following calculations:

- a) Land use (surfaces and crops)
- b) Livestock inventory

- c) Quantification of labor
- d) Quantification of the capital of the production unit

Current Operations Of The UPR

Sales, the amount of household consumption, operating costs, other expenses, and the depreciation of capital assets of the UPR are quantified, consider the following concepts:

- a) Sales
- b) Household consumption
- c) Operating costs (salaries and supplies)
- d) Other expenses (depreciation of equipment and facilities)

Income analysis. Indicators that together provide information on the current situation of the UPR are calculated, these indicators are: gross production value, net added value (NPV) and Net Profit (GN) and Cost of internal factors:

- a) Gross value of production (sales plus consumption)
- b) Net added value (NPV)
- c) Cost of internal factors (IFC)

In the income analysis of the UPR, two aspects are important to highlight, the NPV, which is obtained from deducting from the gross value of the production of the UPR, cash expenses (not including salaries), composed of intermediate consumption products that are obtained from other sectors of the economy, such as seeds, agrochemicals, etc., and a concept derived from the use of capital goods called depreciation. The other aspect is the work used in the production process in the UPR, which is composed of the work of the producer and his family and the work hired by means of a salary and which as a whole is called internal factors of production (Figure 1).

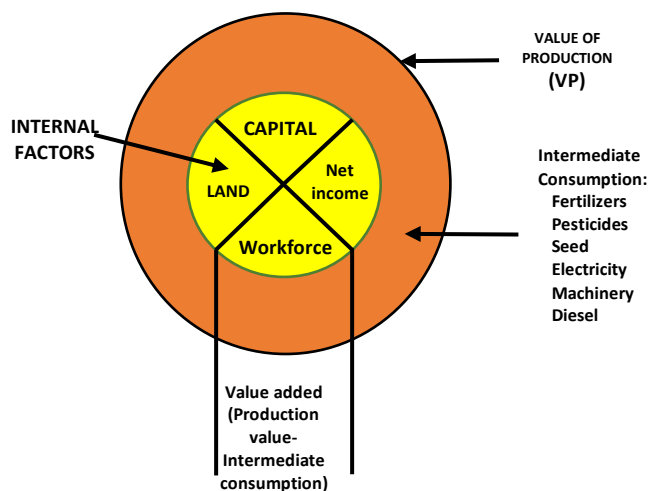


Figure 1. Structure of the value of production Source: Puente, 1995.

Salcedo (2007), does not raise a specific indicator of competitiveness as such and bases its analysis on the indicators of Net Value Added, Net Profit and remuneration to capital, so, to reach a specific indicator of competitiveness, in such a way In order to establish a ranking, it is necessary to retake the components of the NPV and establish a mathematical reason with the Cost of Internal Factors (IFC).

Construction of the concept

Based on what is expressed in Figure 1, the Net Value Added (NPV) is conceived as the difference between the price of a unit of product minus the value of the marketable inputs that are required to produce said unit of product or, said of another In this way, it is the difference between the value of production and the costs of marketable inputs and can be expressed as follows:

$$VAN = p_i x_i - \sum_{j=1}^n p_j y_j$$

Donde:

VAN = Valor Agregado Neto

Xi = Cantidad producida por unidad de superficie (generalmente toneladas)

Yj = Cantidad de insumos comerciables e indirectamente comerciables aplicados por unidad de superficie (generalmente una hectárea).

Pi = Precio del producto en el mercado nacional

Pj = Precio de los insumos comerciables en el mercado nacional

In order to reach the competitiveness relationship, it is necessary to previously define the Cost of Internal Factors (IFC), this indicator expresses the part of the costs that refer to the payment of internal factors, that is, those factors that do not have a defined external market or that cannot be exported or imported as easily as labor, land, electricity, among others. The CFI is given by the following expression:

$$CFI = \sum_{k=1}^n p_k z_k$$

Donde:

CFI = Costo de los Factores Internos

Zk = Cantidad de factores internos aplicados por unidad de superficie

Pk = Precio de los factores internos en el mercado nacional.

So, to know how competitive the UPR is, it should be clear that producers prefer to make excess profits, which they can obtain if the costs of internal factors are lower than the net added value at private prices that the recipient receives and pays. rural producer The Competitiveness Relationship or Private Cost Ratio (CPR) is given by the following expression:

$$RCP = \frac{\sum_{K=1}^n p_k z_k}{p_i x_i - \sum_{J=1}^n p_j y_j} = \frac{CFI}{VAN}$$

Where:

- RCP = Private Cost Ratio
- CFI = Cost of Internal Factors
- VA = Value added

So it is advisable for an agricultural system to remain competitive, it is to try to minimize the Private Cost Ratio (CPR) while keeping the costs of marketable inputs and internal factors low and obtaining a NPV as high as possible (Puente, 1995).

Mathematically, CPR has three possibilities in which it is classified according to its magnitude.

First CPR range <0

It implies that the NPV is negative, that is, that the costs of marketable inputs exceed total income, this is a very critical situation for the production unit since it is in a situation of total vulnerability and is also in economic terms a unlogical situation, because they basically survive with transfers from other economic sectors. They do not generate value, but they do consume value.

Second range 0 <CPR <1

It implies that the NPV is large enough to satisfactorily cover the CFI and there is a proportion considered as net profit of the producer. The more you approach zero without becoming so, it means that there is a large NPV and / or a relatively small CFI. On the other hand, the more you

approach the unit, it implies that the NPV is less and less sufficient to pay the CFIs and therefore the net profit is low. This range could be considered as the optimum range of competitiveness.

Third CPR range > 1

Producers in this situation, generate added value but insufficient to pay the CFI, therefore, they are not competitive, but they are considered in the process of achieving it, it implies that the IFC is greater than the NPV, and therefore there is no gain for the producer.

In a normal population of n production units, the CPR could be expected to behave as illustrated in Figure 2, where the competitiveness band can be seen.

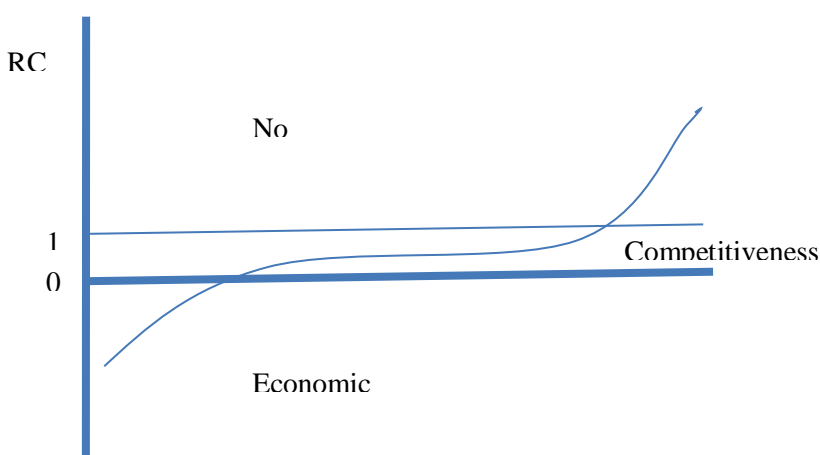


Figure 2. Competitive ranges. INIFAP.2016

Method application. This method was applied in the municipality of San Jacinto Tlacotepec, in the Sierra Sur Region of the State of Oaxaca, Mexico (Figure 3), it is located approximately 70 kilometers west of the district capital of Sola de Vega and 166 kilometers from the city From Oaxaca. According to information from INEGI (2001), geographically it is located at 16 ° 31 'north latitude and 97 ° 23' west longitude; at an altitude of 1080 meters above sea level. It has a territorial surface of 65.53 km² that represents the 0.32 percent of the state extension. In the municipality you can find several types of soil, the sandy one is mostly on the banks of rivers and streams, it is mostly occupied for agricultural use and lesser degree for grazing animals.

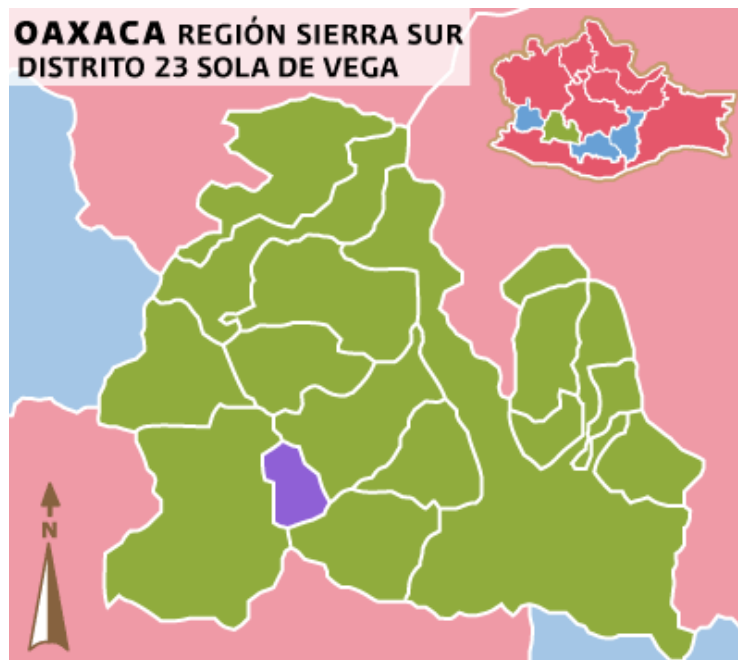


Figure 3. Location of San Jacinto Tlacotepec, Oax. (Source: INEGI, 2001)

60 families were randomly selected to whom a questionnaire was applied to determine the competitiveness situation; the variables considered in the questionnaire were grouped into eight sections, land use, agricultural activities, livestock activities, labor, family unit capital (active and passive), current operations of the family unit, other expenses and observations and comments, which gave a total of 44 questions both open and closed and 256 variables.

According to Salcedo (2007), the information was processed in a spreadsheet, which allowed to perform the necessary operations and thus obtain the income analysis and estimate the levels of competitiveness. Four spreadsheets were structured: Background of the UPR, current operations, capital recovery costs and income analysis. On each sheet the necessary arithmetic operations were established to reach the final indicators.

3. RESULTS AND DISCUSSION

In Table 1, the availability of land in ha and labor in months per year that the UPRs that were studied in San Jacinto Tlacotepec, Oax., In general, the availability of arable land is low, between a and two ha, being on average for the 60 UPR of 2.04 ha; The workforce, on the contrary to the land, does not seem to be a scarce resource, the availability was quantified in the number of months of work destined in the UPR, on average there are 10.8 months available in a year, if the

agricultural cycle is considered to last On average six months, it can be inferred that there is underutilized labor. Most of the production units grow corn and beans for self-consumption and if they have surpluses, they are destined for the local market, many others have some heads of cattle in their backyards, mainly cattle, goats and poultry.

Table 1. Resource availability and linkage to the UPR market studied in San Jacinto Tlacotepec, Oaxaca, Mexico. INIFAP, 2016

UPR number	Land availability (ha)	Labor availability (months)	Sales		Self-consumption	
			Amount (MX\$)	Proportion (%)	Amount (MX\$)	Proportion (%)
1	2.25	12.00	4300	34.96	8000	65.04
2	0.50	6.50	1240	12.82	8430	87.18
3	1.00	9.50	0	0.00	7600	100.00
4	0.50	30.00	0	0.00	7500	100.00
5	8.00	7.00	0	0.00	12500	100.00
6	0.50	7.00	0	0.00	12710	100.00
7	1.50	12.00	0	0.00	9000	100.00
8	2.25	5.00	0	0.00	13750	100.00
9	2.00	9.00	0	0.00	5375	100.00
10	1.00	3.00	0	0.00	2500	100.00
11	0.25	6.25	0	0.00	1800	100.00
12	3.00	6.25	0	0.00	10000	100.00
13	1.00	3.00	0	0.00	5000	100.00
14	1.25	10.00	1000	10.26	8750	89.74
15	2.30	12.00	0	0.00	3980	100.00
16	1.00	12.00	0	0.00	5050	100.00
17	1.00	6.00	0	0.00	10000	100.00
18	1.00	9.25	0	0.00	20000	100.00

19	1.00	6.00	0	0.00	6250	100.00
20	1.00	21.00	0	0.00	8100	100.00
21	2.00	6.00	1368	42.51	1850	57.49
22	2.00	12.00	0	0.00	12250	100.00
23	0.10	2.00	0	0.00	10000	100.00
24	2.10	14.00	1000	4.65	20500	95.35
25	1.00	66.00	0	0.00	6040	100.00
26	1.50	8.00	300	4.00	7200	96.00
27	3.00	8.00	4500	34.19	8660	65.81
28	2.00	1.25	2500	23.81	8000	76.19
29	2.00	1.00	10800	47.37	12000	52.63
30	1.50	25.00	0	0.00	8750	100.00
31	1.00	16.00	0	0.00	60	100.00
32	4.00	6.25	2300	6.97	30700	93.03
33	4.00	25.25	0	0.00	7500	100.00
34	2.00	19.00	1000	13.42	6450	86.58
35	1.75	7.13	5000	45.45	6000	54.55
36	3.00	18.00	0	0.00	8700	100.00
37	0.50	5.00	0	0.00	4400	100.00
38	1.00	7.00	0	0.00	8600	100.00
39	4.00	2.50	0	0.00	7500	100.00
40	3.00	7.00	0	0.00	10000	100.00
41	2.00	5.00	0	0.00	5650	100.00
42	1.00	12.13	0	0.00	5600	100.00
43	1.00	4.25	0	0.00	2800	100.00

44	1.00	6.25	0	0.00	5000	100.00
45	2.00	9.00	0	0.00	5000	100.00
46	1.50	17.00	1000	8.81	10350	91.19
47	4.00	24.00	600	3.85	15000	96.15
48	1.50	8.00	960	10.84	7900	89.16
49	1.00	15.00	0	0.00	10000	100.00
50	3.00	9.00	200	38.46	320	61.54
51	1.00	5.00	0	0.00	10000	100.00
52	4.00	12.13	0	0.00	11250	100.00
53	1.00	8.25	0	0.00	7500	100.00
54	1.50	14.00	3000	24.39	9300	75.61
55	6.00	4.00	900	6.25	13500	93.75
56	2.00	19.00	0	0.00	11250	100.00
57	6.50	7.13	1850	21.39	6800	78.61
58	1.00	9.00	0	0.00	6000	100.00
59	1.50	8.50	4500	27.32	11970	72.68
60	6.00	6.50	0	0.00	34375	100.00
Average	2.04	10.87	805.30	7.03	9017.00	92.97

Table 2 shows the income analysis indicators for each UPR, the value of the production calculated based on the information provided directly by the interviewees was very variable, the highest reached an amount of MX\$ 34,375.00 and the lowest amount was MX\$ 60.00, this value was generated by the production of corn, beans and backyard cattle mainly. The net added value (value of production minus the cost of inputs) also had a variable behavior, the highest value was MX\$ 32,073.00, while the lowest was equivalent to MX\$ -3,019.87, that is, negative. It should be noted the implications of a negative NPV, in this case the production unit operated with monetary losses in the year of study, since the value of production was lower than the costs of inputs, value is not created if not for the Otherwise, value is lost. In this study, a total of seven UPRs that represented 12% of the sixty analyzed resulted in monetary losses in their production processes, that is to say with negative added value, their link to the market measured through

surplus sales was nil or, where appropriate, insignificant The cost of internal factors, which in this case refers to the cost of both family and contracted labor, meant a good percentage of the cost of operation, the largest amount was MX\$ 198,000.00 because there are five members in the family who they are engaged in production, logically that there is an underutilization of labor here and that it is clearly overrated by what should be considered as an exceptional case. This situation of abundance of the family workforce is an inherent characteristic of the UPR in conditions of poverty, high birth rates persist, young people do not study and depend on the little income that is generated in the family unit, there are authors called “peasants ”Who affirm that the cost of family labor should not be considered in profitability studies since this is a factor that explains the persistence of peasant production despite the advance of globalized capitalism.

The relation of private cost as a measure of competitiveness had a variable behavior and its magnitude depends on the previous indicators mainly value added and factor cost, so for this case it was found that according to the theory that there are three ranges of competitiveness, the first of them with negative CPR, given by the negative NPV, 12% of the RPU were located in this modality, negative competitiveness, these units operate with economic losses, are not linked to the market and their factor costs are high. It was found that these families live on value transfers such as the Prospera Program, Procampo or United States transfers, is equivalent to extreme poverty. 82% of the cases, equivalent to 49 production units, were in the range in the process of being competitive, that is, although they produce added value, this was not enough to cover the costs of internal factors, they need to strengthen the generation of value added through technological improvements that allow them to increase the productivity of their crops. They are in the process of being agricultural entrepreneurs. Only 6% of the San Jacinto Tlacotepec production units were reported in competitive conditions, they were located in the competitiveness band with CPR less than the unit but without becoming zero, they generate added value in magnitude greater than the amount it represents the cost of factors and therefore the producer has a net profit, they are considered innovative producers, who have introduced improvements in their agricultural production processes which has allowed them to be more productive over time and in relation to the rest of the producers.

Table 2. Value of production, Cost of internal factors, Net Value Added and Ratio of private cost per UPR in San Jacinto Tlacotepec, Oaxaca, Mexico.

UPR numbers	Production value (MX\$)	VAN (MX\$)	CFI (MX\$)	RCP
1	12300.00	8561.47	36360.00	4.25
2	9670.00	5919.22	19350.00	3.27
3	7600.00	2794.48	28080.00	10.05
4	7500.00	5794.78	90000.00	15.53

5	12500.00	6566.54	21000.00	3.20
6	12710.00	12390.00	21150.00	1.71
7	9000.00	3782.11	36000.00	9.52
8	13750.00	446.25	15000.00	33.61
9	5375.00	1672.16	27000.00	16.15
10	2500.00	824.98	9000.00	10.91
11	1800.00	823.48	18900.00	22.95
12	10000.00	8052.64	18720.00	2.32
13	5000.00	2700.00	9000.00	3.33
14	9750.00	6407.93	30000.00	4.68
15	3980.00	-1414.53	36000.00	-25.45
16	5050.00	511.69	36000.00	70.35
17	10000.00	4500.00	18000.00	4.00
18	20000.00	12576.89	27750.00	2.21
19	6250.00	4300.29	18000.00	4.19
20	8100.00	5310.00	63000.00	11.86
21	3218.00	-1963.82	18300.00	-9.32
22	12250.00	9375.82	36000.00	3.84
23	10000.00	9240.28	6000.00	0.65
24	21500.00	19821.21	42000.00	2.12
25	6040.00	3497.45	198000.00	56.61
26	7500.00	2170.00	24150.00	11.13
27	13160.00	9331.59	24000.00	2.57
28	10500.00	-3019.87	3600.00	-1.19
29	22800.00	19713.75	3130.00	0.16

30	8750.00	8438.95	75000.00	8.89
31	60.00	-2141.82	48000.00	-22.41
32	33000.00	30776.64	18500.00	0.60
33	7500.00	5181.60	75750.00	14.62
34	7450.00	1947.90	57000.00	29.26
35	11000.00	9018.69	21300.00	2.36
36	8700.00	1709.64	45360.00	26.53
37	4400.00	-1352.61	15000.00	-11.09
38	8600.00	5432.11	21000.00	3.87
39	7500.00	5162.43	8100.00	1.57
40	10000.00	7530.00	21000.00	2.79
41	5650.00	1348.51	15000.00	11.12
42	5600.00	956.90	36450.00	38.09
43	2800.00	-2163.64	12600.00	-5.82
44	5000.00	775.30	18750.00	24.18
45	5000.00	4185.95	27000.00	6.45
46	11350.00	5862.83	51000.00	8.70
47	15600.00	8790.32	24000.00	2.73
48	8860.00	7955.15	24000.00	3.02
49	10000.00	6614.77	45000.00	6.80
50	520.00	-2754.73	27240.00	-9.89
51	10000.00	8342.11	15000.00	1.80
52	11250.00	9283.80	36150.00	3.89
53	7500.00	3742.11	24900.00	6.65
54	12300.00	6512.90	42000.00	6.45

55	14400.00	9078.95	45000.00	4.96
56	11250.00	7892.78	57000.00	7.22
57	8650.00	6437.39	21900.00	3.40
58	6000.00	4323.18	27000.00	6.25
59	16470.00	13367.56	25500.00	1.91
60	34375.00	32073.00	20250.00	0.63
Average	9822.30	6083.59	32254.00	5.30

Figure 4 shows the UPRs grouped into the three categories of competitiveness, whose behavior within the population $n = 60$ totally coincides with Figure 2. The policy challenge should be that 82% of the UPR facilitate its transit to the competitive strip with CPR between zero and one. Although strictly without touching the zero and one extremes, this is asymptotic behavior.

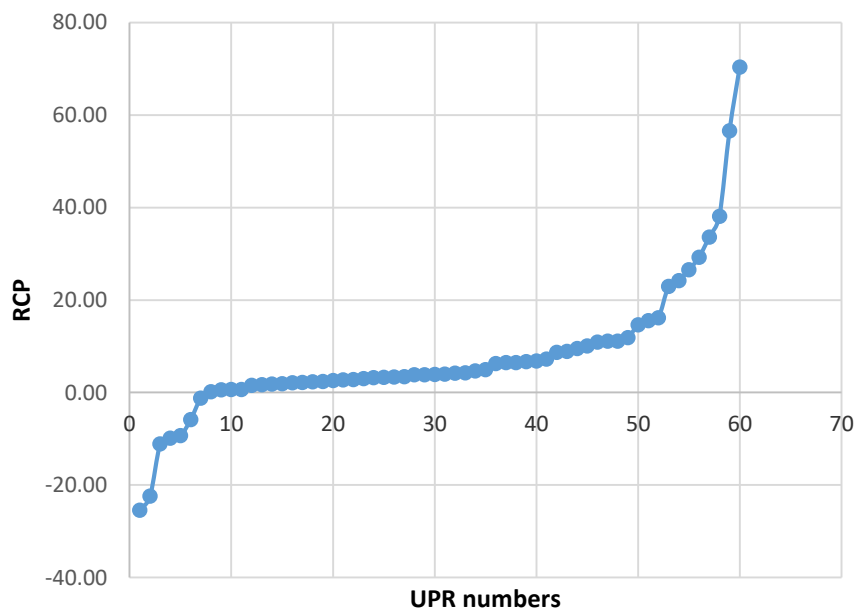


Figure 4. Classification of the UPR by its CPR in negative, competitive and competitive process

To verify the importance of the UPR's link with the market and its relationship with competitiveness, in Figure 5 the level of sales was related to the CPR obtained, in which it is observed that there is a logically inverse relationship, that is, the higher the sales, the lower the CPR, therefore, the family unit is more competitive, and vice versa at lower sales levels it is observed that the CPR increases so the production unit is less competitive. It should be noted that the most desirable is that CPR, although it must be as small as possible, must not reach zero, that is, it must have asymptotic behavior. In this regard, FAO (2014b) classified the production units

by their sales levels and established ranks or strata, the UPRs classified in lower strata were characterized by their low sales levels, while those located in higher strata presented significant sales levels, the study suggests focusing policies to induce small producers of low strata to improve their link to the market; on the other hand Rodríguez et al., (2014) and Rodríguez et al., (2015), empirically demonstrate the inverse relationship of sales and competitiveness for small producers in marginalized communities in the state of Oaxaca, Mexico; Jácome et al., (2016) reached the same conclusion in the case of family production units in poverty conditions in Veracruz, Mexico and subsequently Rodríguez et al., (2016) and Góngora et al., (2019), confirmed In larger studies in various communities in southern Mexico, this inverse relationship between competitiveness and the level of market linkage. Cadena et al., (2019) consider the market link as one of the bases of their proposed model for innovation in marginalized areas by identifying businesses that generate added value from sales.

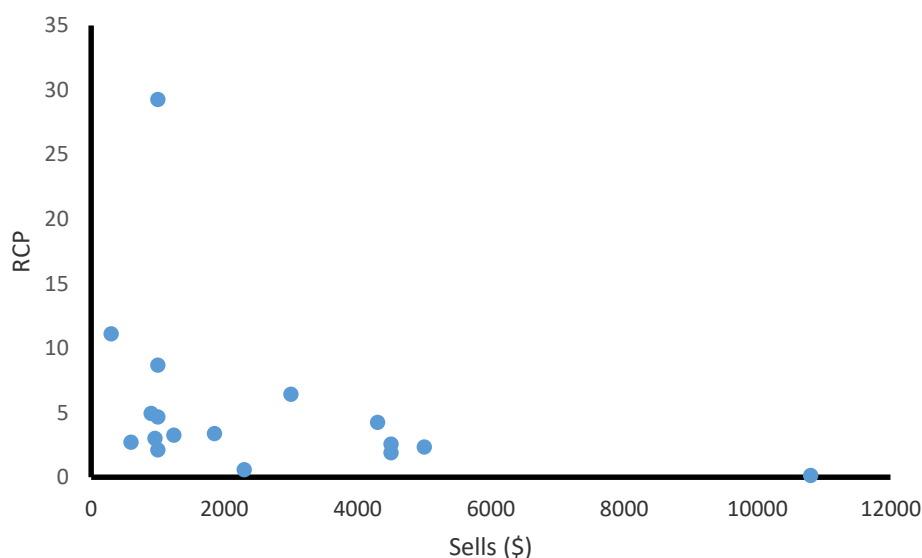


Figure 5. Relationship of the level of sales with the CPR in rural production units in San Jacinto Tlacotepec, Oaxaca, Mexico

4. CONCLUSIONS

Competitiveness is a concept that can not only be applied to non-agricultural companies, in this study it was found that its application in rural areas is feasible for production units made up of small producers, since it allowed the classification of UPRs in ranges of values that provide elements to implement differentiated measures to improve income, combat poverty and marginalization; It is an index highly influenced by the link with the market, the magnitude of which determines the positioning of the production units in the competitiveness range. The link to the market is important as a way to achieve competitiveness because it is the means to increase and diversify monetary income by placing on the market the product generated by the land and its workforce generating added value. Given that a high percentage of UPR were in the range in the process of competitiveness, the challenge of governments should be oriented in

facilitating the transit towards the competitiveness strip with CPR greater than zero, but less than one, that is to say that its value aggregate is greater than the cost of internal factors. CPR is useful for identifying policy measures and assessing their impacts in the rural environment.

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