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POVERTY GROUPS IN MEXICO FROM THE PERSPECTIVE OF INFORMAL LABOR AND PRODUCTIVITY

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ABSTRACT

This work intends to use multivariate analysis to construct homogeneous groups for states, based on structural variables that determine poverty, in order to identify the types of poverty that are prevalent in Mexico; to serve as a reference for the design of varied public policies. We use information from the Encuesta Nacional de Ocupación y Empleo (ENOE) (National Survey of Occupation and Employment), statistical annexes from the Consejo Nacional de la Evaluación de la Política de Desarrollo Social (CONEVAL) (National Council for the Evaluation of Social Development Policy) and state indicators from *México, ¿cómo vamos? Mexico*, how are we doing? Four statistically differentiated groups were identified, which were then located geographically. The conclusion is that these groups have different socioeconomic structures and conditions, thus generating, varied forms of structural poverty that require different approaches, in order to optimize the use of resources to achieve significant reductions in poverty levels, in the medium and long term.

Keywords: Multivariate analysis, partitioning around medoids, differentiated policies, endogenous growth, social development.

INTRODUCTION

Inequality and poverty are two of the most serious social problems that warrant attention when analyzing well-being, as it appears that they are the result of the way in which the sectors of society; State and market are interrelated. (Sanchez Almanza, 2006). Addressing the issue of inequality, in the 1970s Kuznets' proposal (1955) prevailed, which determined that real economic growth resulted from the modernization of the productive sector, and that this would provide us with data to better understand the human being as a productive, consuming and economizing entity, in order to analyze the relationship between the distribution of income and economic growth, while also revealing which factors affect the degree of inequality in this distribution.

Sen (2000) distinguishes two types of poverty; income poverty and poverty due to lack of capacity. In this sense, Boltvinik (2003) establishes that poverty is a concept referring to human deficiencies derived from the limitations of economic resources, which he calls sources of household well-being, in which he includes assets, time and resources and access to free government services; this is why this is recognized as the most reliable manifestation indicating neglect of social and economic human rights (Boltvinik and Damián, 2003).

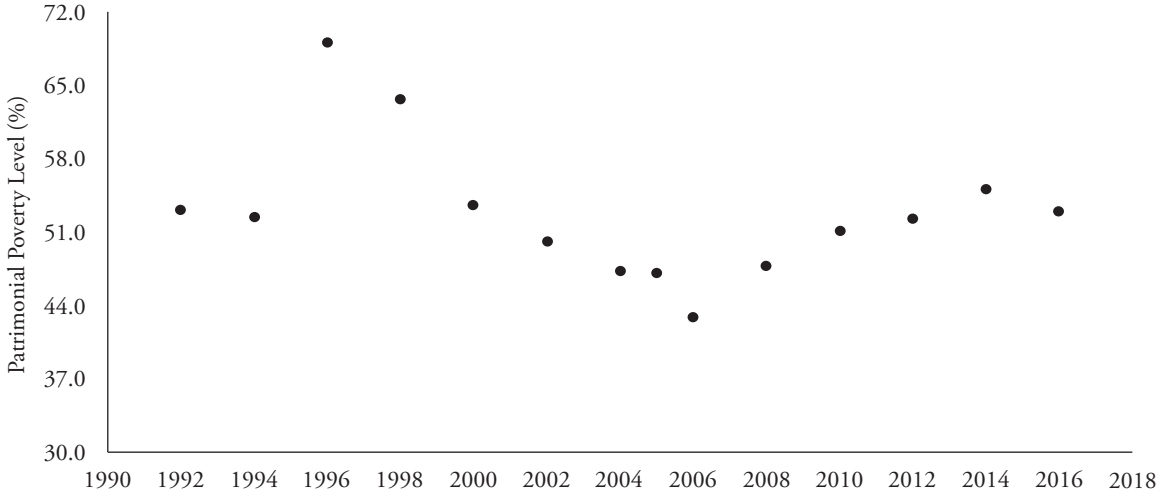
In this context, the Mexican State, through its laws, has assumed a commitment to guarantee the total fulfillment of social rights and, in this way, ensure access to social development for the entire population Consejo Nacional de Evaluación de la Política de Desarrollo Social-CONEVAL,(National Council for the Evaluation of Social Security Policy) 2009.

Until recently, poverty was mainly measured by income; however from 2008 onwards, Mexico developed a methodology for measuring multidimensional poverty, where not only income was considered as a variable for measuring poverty, but this also incorporated fundamental social rights. Despite these methodological and conceptual advances in the measurement of poverty, the socioeconomic structure of Mexico has not changed dramatically; however, understanding of the internal structure of poverty has improved.

Various studies (Díaz González and Orozco Lalo, 2019; Campos Vázquez and Monroy-Gómez-Franco, 2016; Foncerrada Pascal *et al.*, 2014) indicate that the gains from economic growth have not translated into significant reductions in poverty in Mexico, especially in those situations where the degree of inequality is greatest. At the beginning of the 90's, more than fifty percent of the population had insufficient income to reach the well-being limit and, in 2016, more than half of the population did not have income above the well-being limit (Aguilar Estrada and Santiago Cruz, 2017) (Figure 1).

Health, housing, employment and educational services are inherent to development. For this reason, there are various types of poverty; as any basic human need that is not attended to in a timely manner causes a different type of poverty (Salvador Benitez, 2008); likewise each type of poverty will require particular strategies and solutions.

It is therefore essential to identify poverty in Mexico according to region, because although the macroeconomic poverty indicator is effective for disseminating the socioeconomic condition, it does not reflect the particularities of the country, that is, its heterogeneity in



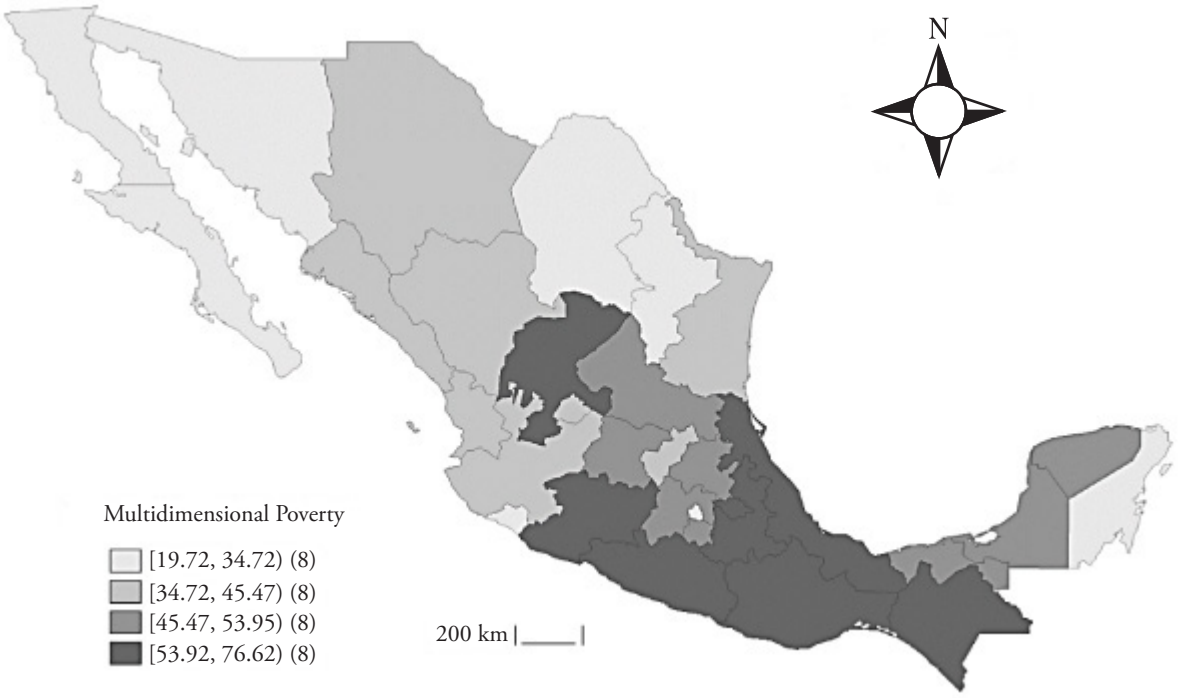
Source: evolution of poverty according to level of income in Mexico 1992-2016 CONEVAL.
Figure 1. Evolution of patrimonial poverty in Mexico during the period 1992-2016.

the context of poverty (López Calva *et al.*, 2007). Figure 2 presents a portrayal of average multidimensional poverty on a national scale for 2012 and 2016, divided into quartiles, where the darkest areas represent the states with the most extreme levels of poverty. The number in parentheses represents the number of states within each quartile.

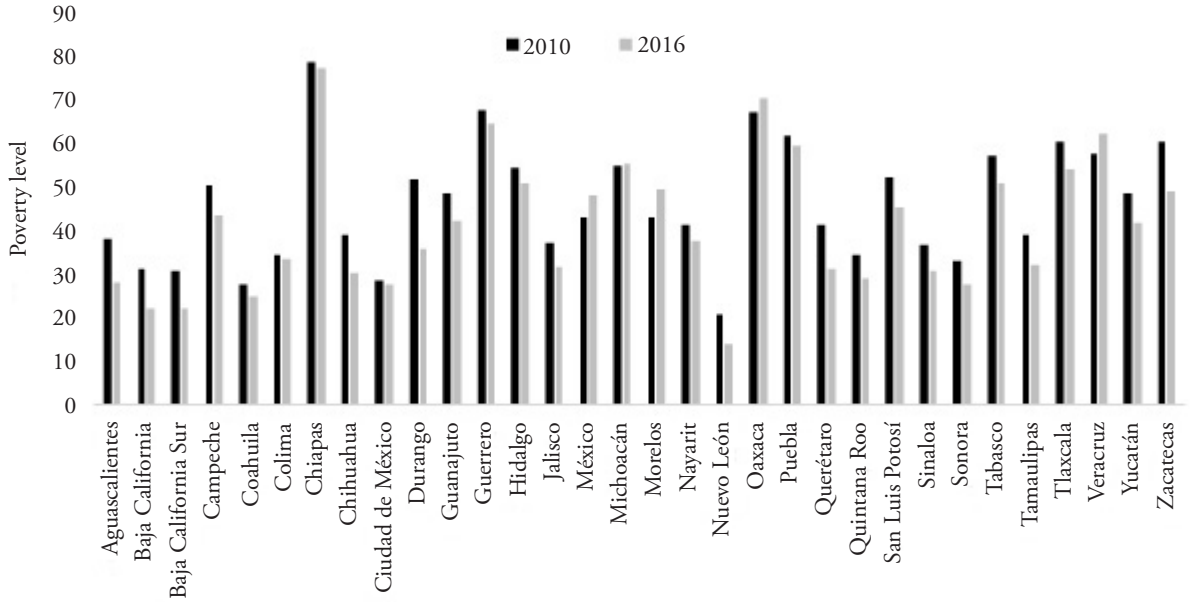
In addition to this, Figure 3 shows a comparison of poverty levels by entity between the years 2010 and 2016. It is apparent that poverty levels are not uniform, as there is variation not only in terms of levels, but also concerning changes in poverty level. This leads to the question: are there groups of poverty in the country that share socioeconomic conditions that affect their levels? Are labor informality and productivity determining factors concerning the type of poverty? Should policies be differentiated and targeted?

Some states have managed to exploit their territorial comparative advantage, as is the case of the states of northern Mexico, others have taken advantage of their tourism potential or their climate conditions and natural resources; however, other states remain mired in poverty, dependent on pre-capitalist subsistence agriculture or have little or no developed industrial and service sectors.

There are various determinants or factors that contribute to the probability of experiencing poverty, the most important being: per capita income, occupation, level of education (human capital), whether the family unit is urban or rural, number of dependents (meaning that, greater number of children or older adults contribute to the probability of



Source: own elaboration using GeoDa 1.12.1.129 and data from the CONEVAL statistical annex 2016.
Figure 2. Quartiles showing average poverty in Mexico for the period 2012-2016.



Source: own elaboration using information from the CONEVAL Statistical Annex 2016.
Figure 3. Multidimensional poverty levels for Mexican entities during the period 2010 to 2016.

descending into poverty), access to basic services, etc. (Reinstadler and Ray, 2010; Arias *et al*., 2010; Minot *et al*., 2006).

However, it would not be effective to concentrate resources on improving one particular aspect. In other words, in a globalized world, it is necessary to continuously ensure that the working class in economies are qualified to continuously adopt technological changes, while increasing their productivity through investment in human capital and improving investment regulations and impositions, so that this grows (Reinstadler and Ray, 2010; Arias *et al*., 2010). Due to the multifaceted aspect of poverty, it is essential to focus efforts on implementing comprehensive policies that reduce, in a coordinated and efficient manner, those elements that afflict and lacerate social development.

In this work, we aim to formulate homogeneous groups, based on structural variables that determine poverty, in order to identify the different types of poverty that will serve as a reference for the design of appropriate political actions for each group, so that they serve to improve or counter the structural causes that generate poverty for them.

MATERIALS AND METHODS

A cluster analysis was performed. The purpose of cluster analysis is to reduce the number of rows in a X_{nxp} matrix into K groups, so that the individuals within each group are as similar as possible, but between groups, as different as possible. In the statistical literature, different methodologies exist to form groupings, for example, hierarchical grouping, K-means method, partitioning around medoids, etc., with the K-means method representing one

of the best known and used (Hartigan and Wong, 1979). However, the K-means method manifests certain weaknesses for defining the ideal number of groups, so the method partitioning around medoids (PAM) was chosen, which consists of minimizing the sum of the distances for each observation, with respect to its closest median or dissimilarities (Reynolds *et al*., 2006). Likewise, PAM makes it possible to evaluate the quality of the clustering, by applying the silhouette index and associated graph.

A dendrogram was generated to show the grouping of the states; this initiates from individual observations and, by means of a distance or similarity matrix, these are combined, depending on whether there is less distance (or greater similarity) until arriving at a single group or root (Anderberg, 2014). In this case, Euclidean distance was applied and an average association (average linkage) in order to measure proximity. Variables used for analysis are shown in Table 1.

All variables are constructed as the state average for each of the indicators for the period 2012-2016. The data for each of the variables was obtained from the CONEVAL Anexo Estadístico (statistical annex) 2010-2016 (2016), México, ¿cómo vamos? (Mexican State Indicators, how are we doing?) (2018) and the Encuesta Nacional de Ocupación y Empleo (National Survey of Occupation and Employment) (INEGI, 2016).

The reasons why each of the analysis variables was selected are indicated below:

i. Informal labor represents an alternative to the lack of salaried employment, generally based on self-employment or part time work or commissioned employment; it takes place in micro establishments and requires lower educational levels than formal employment in the economy, lower levels of productivity and investment, as well as a weak fiscal base that would support public investment projects (Laos Hernández *et al*., 2000; Arias *et al*., 2010). Therefore, higher levels of informality would be expected to lead to higher levels of poverty.

Table 1. Variables used to describe state poverty.

Pob	Proportion of population living in poverty[1]
RezEd	Proportion of the population that is Educationally backward[1]
VulxY	Proportion of the population that does not present social deprivation, but whose income is below the limit for well-being[1]
Palim	Proportion of population whose income is insufficient to feed their family[2]
TIL	Informal Labor Rate[2]
ICE	Jobs generated with respect to the goal, where 1 is 100% of the goal[2]
Asal	Rate of salaried workers[3]
Prod	Pesos earned per hour[2]
5SM	Population whose income exceeds 5 minimum wages[3]
CE	State economic growth[2]
SMS	Proportion of the population that is subcontracted and has reached upper secondary level[3]

Notes: The superscripts 1, 2 and 3 at the end of each description indicate that the origin of each variable was from the 2016 Anexo Estadístico (Statistical Annex) of CONEVAL, *México, ¿cómo vamos?* (Mexican State Indicators, how are we doing?) and ENOE 2010 respectively.
Source: own elaboration.

ii. Human capital is an indispensable aspect of economic growth and a necessary condition for development (Bigsten and Levin, 2000). Educational backwardness and the subcontracted population with secondary and higher education were considered to constitute human capital indicators. Educational backwardness plays a fundamental role, because educational investment in the early years generates higher lifetime returns than investments at later stages (Arias *et al.*, 2010).
iii. Economic growth is directly related to the creation of wealth through larger production units, higher levels of employment and technology. Therefore, lower levels of poverty would be expected among those states with higher economic growth, job creation and productivity, as "technical change and corresponding increases in productivity explain 87.5% of the increase in *per capita* income" (Gonzáles Estrada, 2018).

A table of correlations was obtained for the variables Pob, RezEd, TIL and Prod. These are expected to be directly interrelated, with the exception of the variable Prod, where higher levels of educational backwardness and informal labor are estimated to be highly correlated with poverty, whereas productivity is expected to be highly related to the reduction of poverty. A t-test was performed to test the significance hypothesis for the correlations:

$$H_0 : \rho = 0$$
$$H_1 : \rho \neq 0 \quad (1)$$

The T statistic for this test is defined as:

$$T = \frac{r}{\sqrt{\frac{1-r^2}{n-2}}} \sim t_{n-2} \quad (2)$$

where r is the Pearson product-moment estimator of ρ, where the decision rule is to reject the null hypothesis, when the p-value is less than a significance level $\alpha \in (0,1)$ set by the researcher. Finally, the conglomerates were geographically located.

RESULTS AND DISCUSSION

Groups

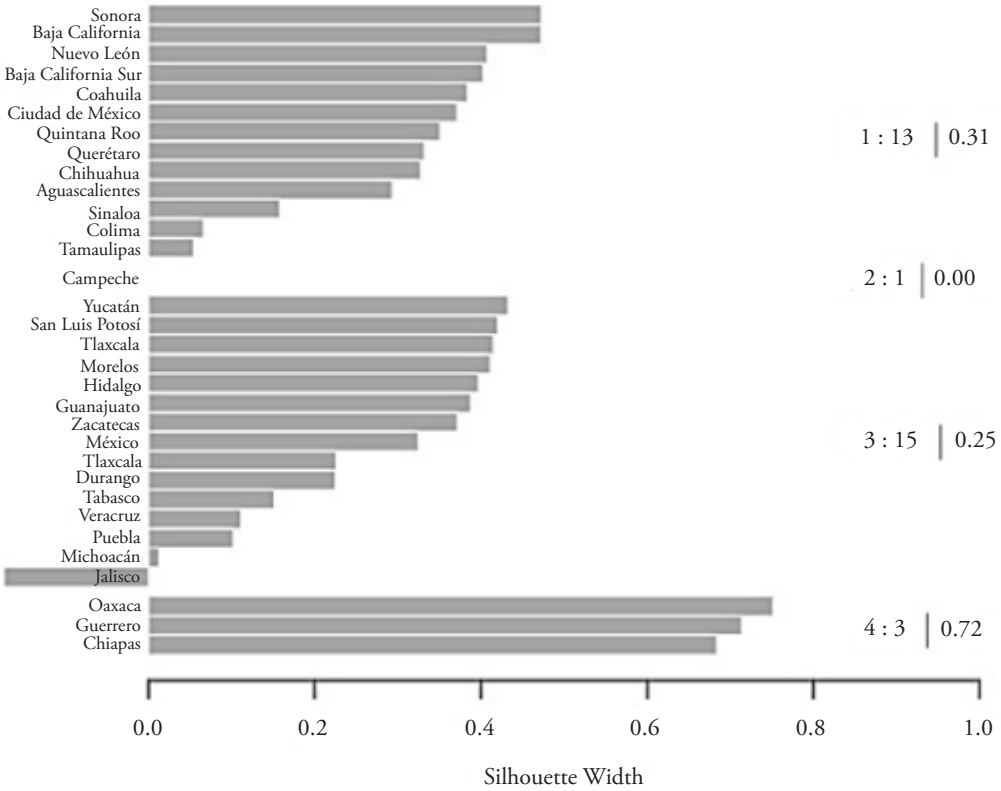
Four different groups were formed. In Table 2, the number of states per group, average silhouette width, the distance of the farthest observation of each group (Maximum Dist) and the average distance of the group (Mean Dist) are presented. In Figure 4, the silhouette graph shows how assertive the grouping is. The graph displays the group number, followed by the number of observations presented for it, and finally the silhouette width value. If the value of the silhouette tends to 1, it means that an observation has been correctly assigned to a group, 0 means that the observation is border-line between two groups and if it is negative, it indicates that an observation could well pertain to a different group. Figure 5 shows the different widths of the silhouette according to the number of groups, showing that the optimal number for groups is 2 and 4; however, the optimal number

Table 2. PAM results.

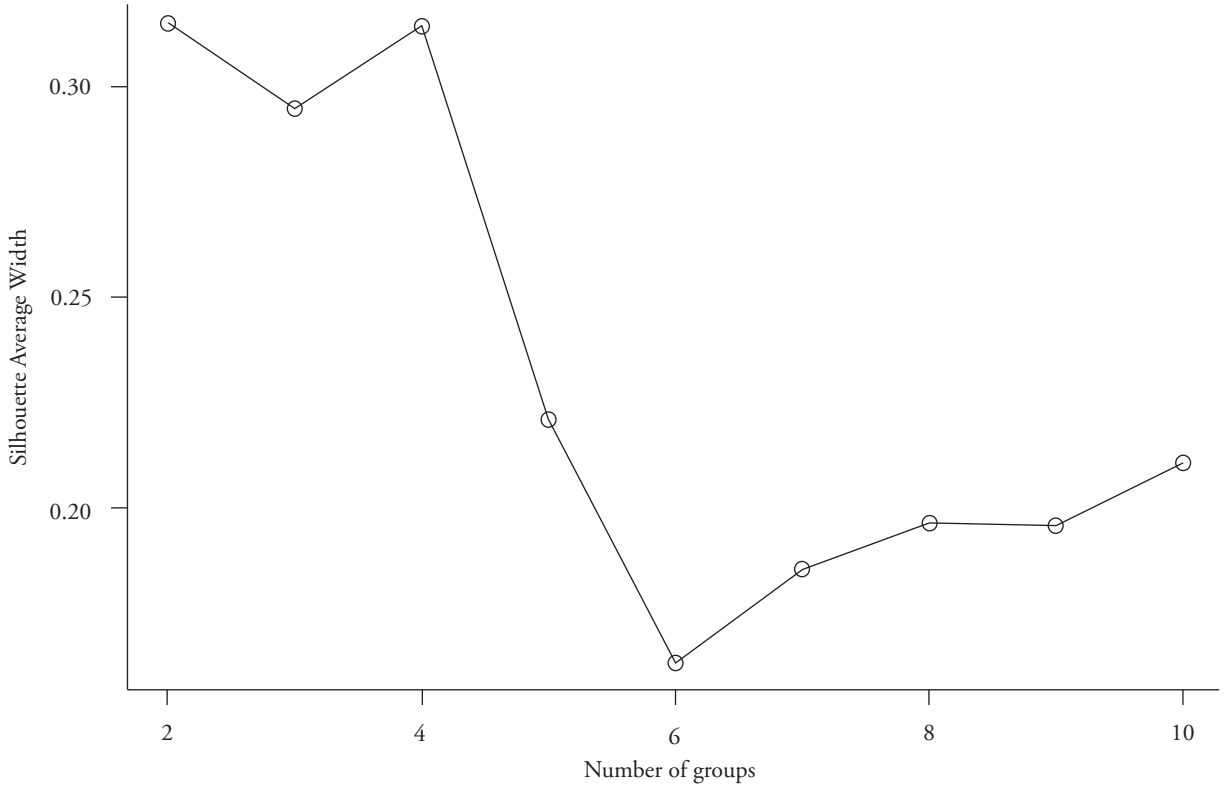
Group	Size	Silhouette width	Maximum Dist.	Average Dist.
1	13	0.3148	3.0921	2.098
2	1	0.0000	0.0000	0.0000
3	15	0.2541	3.6136	2.036
4	3	0.7163	1.4715	0.7439
		0.3142		

Source: own elaboration obtained with PAM results using RStudio v1.1.456 software.

is considered to be 4, as it would be inappropriate to conclude that there is a dichotomy between the socioeconomic conditions of the Mexican states, that is: poor and not poor. Apparently, the four groups are well differentiated and manifest a correct grouping; however, the state of Jalisco is the only one that has a silhouette whose value is negative, but the grouping obtained is the best that the PAM algorithm was able to obtain. Group 2 contains a single observation and in this case the silhouette width is not defined, as two or more observations are required in order to calculate it. Apparently, the grouping is correct.



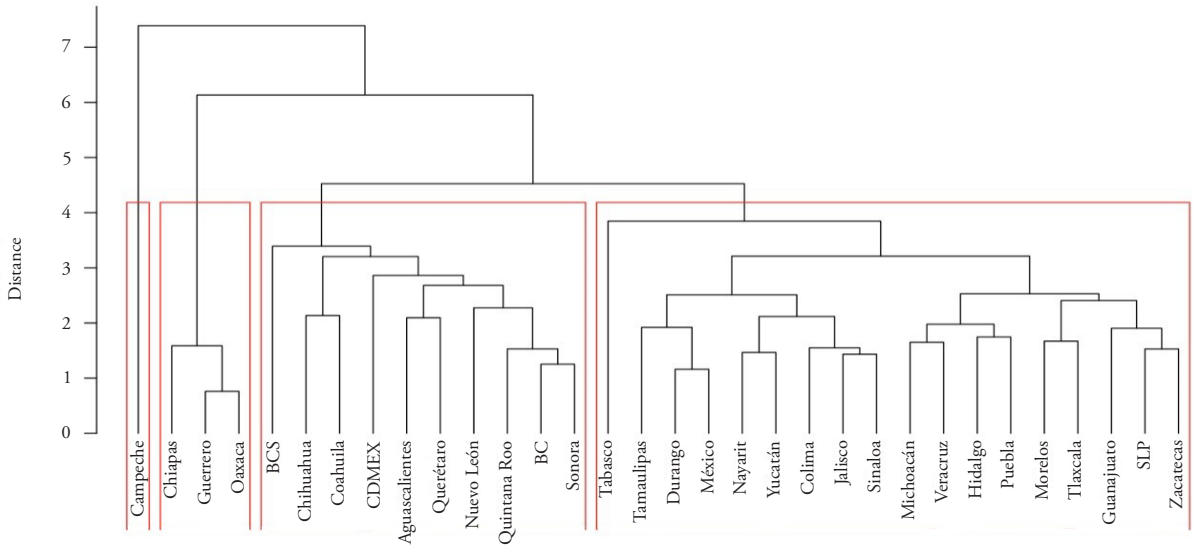
Source: own elaboration using the RStudio v1.1.456 software.
Figure 4. Graph of profiles.



Source: own elaboration using the RStudio v1.1.456 software.
Figure 5. Width values for profiles depending on the number of groups.

Figure 6 presents a dendrogram, where it is possible to observe four well-differentiated groups, whose members concur with those obtained by PAM, except for the states of Tamaulipas, Sinaloa and Colima. These states have narrow silhouette widths and once again it is apparent that observations with values close to 0 are associated with observations at the group borderline. Table 3 shows a comparison of weighted means, where the Economically Active Population was used as a weight, in order to reveal the heterogeneity between groups and the most important factors or variables for each group.

It should be emphasized that these groupings are homogeneous, specifically at state level. Within each entity, a set of heterogeneous municipalities will become evident; however, although there is heterogeneity within each federal entity, this does not diminish the relevance of grouping at state level. Even if two or more municipalities are found, whose socioeconomic conditions are very similar and belong to states pertaining to different groups, it is important to highlight that they fall under a different socioeconomic structure and, therefore, although they are similar and may share certain policies, their context and economic conditions are different, indicating the importance of carrying out an initial analysis of this kind.



Source: own elaboration obtained using RStudio v1.1.456 software.
Figure 6. Dendrogram of entities created, based on the indicators in Table 1.

Correlation between variables

Table 4 shows the correlations between the variables Pob, RezEd, TIL and Prod. It is apparent that effectively, higher levels of educational backwardness and rates of informal labor result in higher levels of poverty. Although, this negative correlation is not as strong for productivity as compared to the others, notably, it is negative for all of them. This

Table 3. Weighted average for the indicators for each of the g.

Indicator*	Groups			
	1	2	3	4
Pob	30.01	45.63	49.28	70.48
RezEd	13.40	19.83	20.17	29.23
VulxY	8.04	4.67	6.48	2.22
Palim	30.58	37.35	41.83	64.67
TIL	43.23	54.63	58.22	70.31
ICE	1.30	-0.48	0.47	0.03
Asal	71.01	58.87	62.68	42.13
Prod	225.48	861.03	124.50	78.13
5SM	9.56	11.09	5.77	3.8
CE	3.42	-3.57	3.00	1.54
SMS	19.78	27.32	21.91	19.37

* The description for each indicator corresponds to that presented in Table 1.
Source: own elaboration based on results obtained using RStudio v1.1.456 *software*.
and with information from the Anexo Estadístico (Statistical Annex) de CONEVAL 2016, Mexico's Economic traffic lights, how are we doing? and ENOE 2010.

Table 4. Table showing correlation for the variables Pob, RezEd, TIL and Prod.

	Pob	RezEd	TI	Prod
Pob	1			
RezEd	0.8512***	1		
TIL	0.8919***	0.7194***	1	
Prod	-0.2823·	-0.2690·	-0.2638·	1

Note: ***, **, * and · represent significance levels of 0.01, 0.05, 0.1 and 0.16 respectively
Source: own elaboration with data from the Anexo Estadístico (Statistical Annex) de CONEVAL 2016, and *México, ¿cómo vamos?* (Mexican State Indicators, how are we doing?).

means that higher levels of education and formal employment are associated with improved levels of productivity, and it is expected that this relationship translates into a decrease in poverty indicators. Although this investigation cannot assume that this correlation implies causality, various studies corroborate the strong effect that informal labor has on the level of poverty (Orjuela Montoya, 2021; Sánchez Torres, 2015; Mario and García, 2013; Beccaria and Groisman, 2008; Rosenblut, 1994). Likewise, authors such as Aguado Quintero *et al*. (2007), Ordaz (2009) and Navarro Chávez and Delfin Ortega (2017) have detected an inverse relationship between levels of education and poverty.

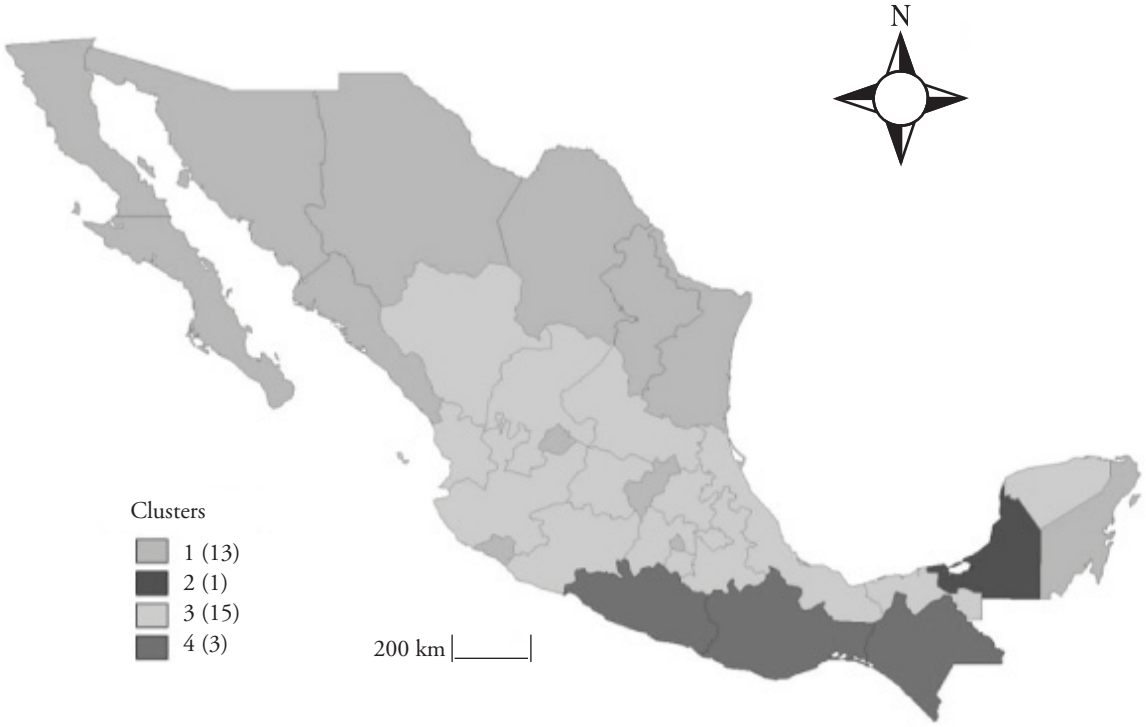
Geographical location of the groups

Figure 7 shows the different groups in Mexican territory. Group 1 includes states from the North of the country such as North and South Baja California, Chihuahua, Coahuila, Nuevo León, Sinaloa, Sonora and Tamaulipas, from the Center such as Aguascalientes, Mexico City, Colima and Querétaro, and from the East such as Quintana Roo. Group 2 consists of Campeche in the southeast of the country. The states of Durango, Guanajuato, Hidalgo, Jalisco, Mexico, Michoacán, Morelos, Nayarit, Puebla, San Luis Potosí, Tabasco, Tlaxcala, Veracruz, Yucatán and Zacatecas belong to group 3, the latter being the largest group covering a large part of the North-Central region of the country and the Central-Eastern part. Group 4 is made up of the poorest states in the country that are in the South, consisting of Chiapas, Guerrero and Oaxaca.

This state group coincides with 71% of group 1 and 60% of group 4, according to the results found by Navarro-Chávez *et al*. (2016) in a study concerning the generation of social well-being in Mexico, in terms of the most efficient and least efficient states, respectively.

The grouping in "bands" reflects dependency or spatial autocorrelation, which, according to Moreno and Vayá-Valcarce (2000), occurs because the value that a variable manifests in a region is not explained solely by internal conditions, but also by the value of those variables in neighboring regions.

These results are to some extent consistent with the descriptive results presented by Andrés-Rosales, *et al*. (2017) in a study about the concentration of high-tech industries, in which the states of the North and the Bajío, because they have accumulated most of the high-



Source: own elaboration using GeoDa 1.12.1.129 and results obtained using Rstudio v.1.1.456.
Figure 7. Groupings for Mexican states in Mexico during the 2012-2016 period.

tech industries, in addition to having the labor specialization indices for high technology and manufacturing sectors, have better or less precarious working conditions compared to other regions, which translates into better wages.

Likewise, this coincides with the spatial analysis, in which Herrera-Nebel, et al. (2020) find spatial dependency in the analysis of poverty in the Federal Mexican states, considering variables by entity in proportion to the population living in poverty, GDP per capita, responsibility in terms of the labor context, health spending and educational spending.

Group I

This may represent the set of states with the highest level of well-being. This group has the lowest level of poverty, as well as the lowest level of population manifesting educational backwardness, while also having the highest level of job creation and lowest rate of informal labor. In other words, these states generate enough formal employment for their población económicamente activa (economically active population) PEA, making it possible to cover the required labor supply and, therefore, to have access to a constant and secure income. Given the correlation between educational backwardness and productivity, states with a higher level of human capital would be expected to have higher levels of productivity and, therefore, better wages, again impacting the level of well-being and reducing poverty.

It is important to highlight that this group manifests the highest level on the income vulnerability indicator. This could indicate a guideline for the design of a policy aimed at the vulnerable population, given that society has covered its needs or social deficiencies, but income level is still insufficient. This could be due to various reasons, such as:

i. The number of recipients in families is low. It may be that it is only the mother or father figure who works, whose income would then be insufficient to meet household requirements.
ii. The incorporation of women into the labor market. This would suggest that women face difficulties for entering the labor market, so that the number of recipients per household does not increase in those households, where there is a female head of the household or where a greater number of women live. Or it could be that the remunerations received by women are lower.
iii. The jobs generated still rely on backward technology. If this is the case, the productivity of marginal labor would still have a wide gap to fill, so that wage remunerations would increase by increasing production, productivity or reducing costs in companies.

Group II

Group II presents a particular case related to petroleum related activity in the state of Campeche, because this presents high productivity indexes derived from the petrochemical industry, which makes it possible to generate a high value with few hours worked. However, they lag far behind in terms of economic growth, job creation, and informal labor. This may be due to the fact that efforts have focused on developing this economic activity, thus weakening or neglecting the growth of economic activity in other sectors, resulting in a lack of growth in formal and better paid job opportunities. Table 5 presents a comparison between the averages for variables that relate to the states of Tabasco (group III) and Oaxaca (group IV). Here it is apparent that Tabasco manifests high productivity, derived in large part from petroleum related activity; however, it is not comparable with that of Campeche, although its other variables are very similar. This is the variable that causes Campeche to remain isolated. In addition, despite the fact that Oaxaca has productive activities related to petroleum, the state in general manifests indicators that are very

Table 5. Average for economic variables for the states of Campeche, Tabasco and Oaxaca.

	Poverty (%)	Educational backwardness (%)	Vulnerability in terms of income (%)	Informal Labor (%)	Job Creation Index	Productivity (Pesos/hour)	Economic growth (%)	Level of salaried workers (%)
Campeche	44.01	18.40	4.79	54.63	-0.48	860.85	-0.04	62.49
Tabasco	50.04	17.52	2.65	58.72	-0.03	300.72	-0.01	70.45
Oaxaca	66.36	27.39	2.03	72.67	0.10	79.63	0.02	44.19

Source: own elaboration with data from the CONEVAL Anexo Estadístico (Statistical Annex) 2016, México, ¿cómo vamos? (Mexican state Indicators, ¿how are we doing? and ENOE 2016.

different from those of Tabasco, with higher proportions of its population in poverty and greater educational backwardness, greater informal labor, lower rate of wage earners and significantly lower productivity.

Gonzales Estrada (2018) emphasizes that changes in production and level of employment are phenomena that reflect the decisions of employers and workers, so the appropriate economic policy to increase production and employment is one that increases microeconomic incentives for companies to produce more and consequently to increase employment and reduce unemployment. This group manifests a creación de empleo (ICE) (job creation index) with a negative average. In other words, this state is not only failing to generate enough formal jobs for its PEA, but its investment has contracted to such a degree that it has generated a decrease in job creation. It is relevant to ask: what policies/incentives are being implemented/granted to attract investment and achieve not only diversification, but also sustainable use of economic potential?

The petrochemical industry expects to regain importance following energy expansion; however this does not mean that the state should remain dependent on this activity, considering that renewable energies are taking on an increasingly important role worldwide and are being introduced into the market at ever lower costs. It should therefore diversify alternatives by applying economic incentives and exploiting its agricultural sector, generating investment in a variety of sectors, so that it can achieve positive economic growth at the very least, as average growth during these five years was negative.

Group III

This group includes developing states in the sense that they are undergoing a phase of industrial growth, of capital formation and acquiring importance at the national level in terms of their GDP contribution. These are relatively small states with diverse principal economic activities, for example Guanajuato, which is relevant in the automotive industry, or Zacatecas, which is notable for mining, while Durango has agricultural, forestry, and livestock projects, as well as importance in mining, and Yucatán, which is a tourist destination. Therefore, each of the states must strengthen the most important sector of its economy.

Gonzales Estrada (2018) points out that economic policy should be directed towards encouraging technical change and productivity in the economy, as fiscal policy only matters in terms of the degree of financing it can provide to projects that boost the overall productivity of profitable aspects of the economy.

Besides this, they face a task, in terms of the development of their human capital, because it is apparent that this group manifests one of the highest averages for educational backwardness. The proportion of the population who earn more than 5 minimum wages indicate the need to improve wage conditions in these states, which will be achieved by investment in technology and specialization in human capital. The strategy aimed at combating poverty in large cities must be principally directed towards the development of skills and job creation, enabling the population in poverty to integrate with the rest, and access the benefits which exist in the areas where they live. (Aguilar Estrada and Santiago Cruz, 2017).

Group IV

In these states crucial deficiencies exist, so it is necessary to directly fulfill the elemental needs of the population in terms of food and basic services, by means of public investment, subsidies and programs, while always being careful concerning who to target, as indicated by Aguilar (2018) in a study concerning the poorest municipalities in Mexico.

This group requires policies for agricultural development, because "agricultural growth is also the principal way to reduce poverty, both in rural and urban areas. Poverty alleviation is universally recognized as a valid concern and economic policy obligation." Organización de la Naciones Unidas para la Agricultura y la Alimentación (Food and Agriculture Organization of the United Nations), 2004.

An increase in agricultural productivity makes it possible to generate surpluses in the form of agricultural production, labor, raw materials, capital and increases in external exchange, while increasing the demand for goods and services from the industrial sector, as well as causing indirect effects caused by the change in the level of food prices (Tiffin and Irz, 2006; Schneider and Gugerty, 2011). Countries that experienced the highest agricultural growth per worker had the greatest reductions in poverty rates, and factors that made the greatest contribution to the increase in productivity included: investment in roads, agricultural research and development, and expansion.

It has also been demonstrated that the proportion by which the increase in agricultural productivity and, therefore, in the income of farmers has helped to reduce poverty is approximately 50%. Meaning that, an increase in agricultural productivity has a substantial impact on poverty reduction, while increases in productivity in non-agricultural activities contribute to a much lesser extent (Cervantes-Godoy and Dewbre, 2010; Minot *et al*., 2006).

Inter-sectorial displacement of the labor force that occurs between the agricultural and industrial sector represents a practically irreversible flow of resources. A concern that arises from the above relates to the high costs per emigrant derived from investment in additional infrastructure in the urban environment, for example new housing, water and sewage services, transportation systems, etc. Likewise, if this migration from rural to urban areas exceeds the capacity to generate remunerative jobs, it generates severe social problems, particularly job insecurity, which triggers other social ills (Organización de las Naciones Unidas para la Agricultura y la Alimentación, (Food and Agriculture Organization of the United Nations) 2004). It is thus necessary that agricultural activity not be hastily deterred by urban growth, because if so, this may have irreversible with very costly outcomes for economy and society.

CONCLUSIONS

These results make it possible to conclude that at the national level, there are groups of states with similar socioeconomic conditions, but which also differ from the other groups and therefore represent a different type of poverty, with different structural causes, requiring differentiated public policies focused on the most important factors that affect

each type of poverty. It is imperative to emphasize this, because if this grouping was not accomplished or the grouping was only at the municipal level, then perspective would be lost in terms of context, economic dynamics and strengths, inherent to particular states, as well as the degree of development in infrastructure and the legal structures that govern municipalities, among others. This reveals the importance of differentiating, firstly at a state level, taking into account key factors such as productivity and informal labor.

Four well-differentiated groups were found. The first group (I) has the lowest levels of poverty. Notably, living standards here are defined in terms of high levels of productivity, together with low rates of educational backwardness and informal labor. Investment in this group, in terms of physical, technological or human capital must not be discouraged.

Group II refers to only one state; Campeche. The very high levels of productivity derived from petroleum activities are not sufficient to promote development. Campeche lacks economic growth and job creation, and also manifests a high level of informal labor. It is necessary to diversify the economy by providing economic incentives for companies to invest in the state, in order to generate positive economic growth with increases in family income through employment; an effective way of reducing poverty.

Although levels of poverty are similar for groups II and III, their causes are different, because group III has, although very limited; a positive formal job creation index, in addition to favorable economic growth. For these groups, it is necessary to focus efforts to improve educational levels, while implementing a system of incentives to attract investment, so that there are more formal jobs and skilled labor.

Finally, group IV is the grouping with the highest levels of poverty, informal labor, educational backwardness and lowest levels of productivity. The poorest states in the country need agricultural policies to achieve a productive surplus, through which they will generate higher income, surplus of raw materials and labor that will promote a process of economic dynamism, without neglecting the importance of education, as future generations will require skills to become integrated into the industrial and service sectors.

Although there is no single methodical solution to solve the social problems facing Mexico, it is clear that any type of plan for dealing with these problems must pursue two basic principles: economic growth and social development. The formation of conglomerates in Mexico and their mapping makes it possible to recognize the location and the stage or socioeconomic condition through which the different groups are proceeding, so that apt responses can be implemented and adjusted to the needs or opportunities for growth and development for each one.

Finally, these groupings were generated a posterior with information from the 2012-2016 period, meaning that over time these structures can, or should, change, which will demonstrate the effectiveness or ineffectiveness of the policies, and endogenous efforts on the part of each state to obtain improved levels of well-being. The conglomerates are therefore not permanent, as they must be constantly updated, making it possible to observe the results from these policies and, if necessary, alter the groups to which they are directed.

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