

Regional economic specialization and diversification in the State of Hidalgo

Summary

The level of specialization and economic diversification of the 84 municipalities of the state of Hidalgo is presented. Results obtained by the level of Participation of the Sector in the State, the Participation of the Municipality in the sector and the Relative Specialization Coefficient (QR) using for this the Total Employed Population by municipalities (POT) obtained from the 2019 Economic Census. It stands out that the state specializes in three activities: retail trade with 29.6%, manufacturing 26.3%, and temporary accommodation and food and beverage preparation services with 10.6%. It should be noted that the municipality of Cardonal has the highest specialization coefficient of 0.78 derived from its significant participation of 82% (the highest) in terms of its participation in terms of economic activity municipalities.

Keywords: specialization, diversification, regional, economic

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Introduction

The study of regional economic structure has been analyzed from different points of view. The results of these investigations help to reinforce and complement the results obtained by this work. For example, the study on urban growth and economic diversification of fuel the need for more studies in the country on urban economics. Likewise, the work on the evolution of GDP in the Central Plateau.¹ The importance of the productive restructuring process in recent years in the State of Hidalgo and the need to continue continuing with this type of projects is highlighted. There are also those that highlight regional inequalities, such as the study of² that of interstate economic convergence of³ specialization and key sectors⁴ and the regional heterogeneity⁵ where these authors highlight the urgency of seeking alternatives to reduce the economic gaps between the different economic activities established in the regional economic geography of the country.

Justification

The State of Hidalgo is one of the states of the Mexican Republic that presents not only a strong economic divergence between economic sectors as shown in Table 1 but also geographically since it represents 1.1% of the national territory with a population of 3,082,841. Inhabitants which represents 2.4% of the country's total. In economic terms, the economic activity that contributes the most to the state GDP is tertiary activities with 62.6% according to figures from the National Institute of Geography and Informatics.⁶ Likewise, in 2020 it ranked 19th for its contribution to the national GDP with a wealth of \$352,852 million pesos, just 1.6% of the national total.

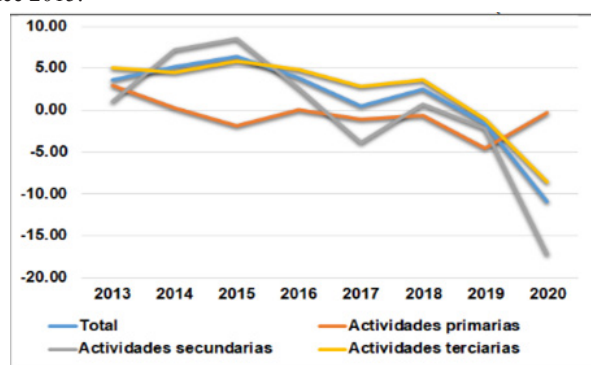
Table 1 Main sectors of activity

Sector of economic activity	Percentage of contribution to state GDP (2016)
Primary activities	4.1
Secondary activities	33.3
Tertiary Activities	62.6
Total	100

Note: Own elaboration

Let us remember that the economic structure of a region is distributed by economic sectors. They include primary, secondary and tertiary activities. In the case of the State of Hidalgo, according to figures from the 2019 economic census, the most important economic sectors that concentrated the largest number of economic units are Retail Trade (54,233), Other Services, Except Government Activities (16,643) and Transportation Services. Temporary Accommodation and Food and Beverage Preparation (15,081) and finally Manufacturing Industries (14,856). In summary, the economic vocation is mainly commerce with 45.6% participation.

It is worth mentioning that since 2015, secondary activities have been the most affected as shown in Graph 1, unlike primary activities, which in 2019 showed a recovery in their growth rate.⁷ As a whole, it can be seen that there has been a drop in total economic activity since 2015.



Graph 1 Percentage variation of the gross domestic product (2013-2020).

Note: taken from INEGI, press release, No. 754/21.

In this scenario the following research questions arise:

- 1) What is the relative size of your activities?
- 2) What degree of diversification does the regional economy present?
- 3) Is it advisable or not to reinforce this or that industrial activity in this or that region?
- 4) Which sector shows a greater degree of concentration?

To answer these questions, it is essential to carry out a territorial economic analysis at the municipal level since it allows identifying the specific problem at the micro region level.⁸ In this same sense⁹ point out that the Huasteca region belonging to the State of Hidalgo is characterized by a high degree of marginalization and extreme poverty. Based on these points, this work has the following objectives:

- 1) Measure the degree of participation that the economic sectors have at the municipal level
- 2) Calculate the degree of participation that the economic sectors have at the municipal level
- 3) Determine the level of specialization and economic diversification of the 84 communities of the State of Hidalgo based on the Relative Specialization Coefficient

Theoretical framework

In the study of regional dynamics it is essential to consider the regional economic structure since it refers to the composition and distribution of the economic sectors as reviewed previously and answers questions about what activities lead the regional economic process and the presence of comparative advantages, linkages and agents related to economic activities.

It is also important to consider the inter temporal behavior of municipalities; that is, the dynamics of economic processes in a territory, as well as those factors that determine the levels of regional competitiveness in an environment of increasing globalization. This is where the concept of regional specialization becomes important, which for the purposes of research is important to distinguish its two forms of conceptualization:

- a) Absolute or intraregional specialization; according to which a region is said to be specialized simply in the largest sector(s) within the region.
- b) Relative specialization or interregional: The comparison is made with all the regions according to which a region is specialized in the sectors that in the region have a relative size greater than in the country or region.

Of course, it is important to know which is the sector that generates the most employment in a region or which is the sector with the highest production value. It is even more important to know the relative size of regional economic sectors or, put another way, relative regional specialization is a more widely used concept than absolute measurement alone. The analyzes linked to the regional economic base, employment and income multipliers, and interregional trade, to name just a few, are based on the use of the relative concept of regional specialization.

Method

To measure the evolution and behavior of the level of specialization and economic diversification, various analysis techniques have been used. They range from the component analysis application, factor analysis techniques¹⁰ or fixed effects panel data model.¹¹

Fortunately, there are research articles that use the same approach used in this work with the difference that the temporality and regions are different. For example, if you have the job on specialization of¹² specialization and manufacturing growth¹³ or about regional economic concentration;¹⁴ urban growth and economic specialization.

To meet the stated objectives, we will initially start by constructing the Sector-Region matrix whose columns refer to the regions and whose rows correspond to the sectors as shown in Table 2.

Table 2 Sector-region matrix

REG/SEC	R1	R2	.....	Rj	RM	$\sum_{j=1}^n SEC$
S1	V11	V12	.....	V1j	V1m	V1j
S2	V12	V12	.....	V1j	V1m	V1j
S3	V13	V13	.....	V1j	V1m	V1j
.....
Yeah	Vi1	Vi2	.....	vij	Vim	Vil
Yes	Vn1	Vn2	.....	Vnj	Vnm	Vnj
$\sum_{j=1}^n REG$	Vi1	Vi2	.....	vij	Vim	vsr

Note: Own elaboration

Where:

Yes = Sector or branch of economic activity

Rj = Geographic region or municipality

V= Analysis variable

Vij =value of the variable V corresponding to sector “i” and region “j”

Vsj = value of V corresponding to the sector total (sector i) $\sum_{i=1}^n V_{ij}$

Vir = value of V corresponding to the total of the region (region j) $\sum_{j=1}^n V_{ij}$

Vsr = value of V corresponding to the global total (sectoral or regional sum) $\sum_{j=1}^n \sum_{i=1}^n V_{ij}$

From the previous matrix, the following variables and indicator are obtained:

Participation of the Sector in the State (Pij): Represents in percentage terms the activity of region “j” that occupies sector “i” and is used to examine the degree of specialization whose values may be less than or equal to 100 %. The formula to calculate it is given by:

$$Pij = \frac{V_{ij}}{\sum_{i=1}^n V_{ij}} \tag{1}$$

Participation of the Municipality in the Sector (Pji): Indicates the percentage of region “j” in the activity of sector “i” and is used to analyze the interregional distribution of the sector and the absolute concentration whose values may be lower or equal to 100%.

$$Pji = \frac{V_{ij}}{\sum_{i=1}^n V_{ij}} \tag{2}$$

Relative Specialization Coefficient: Sample the relationship between the participation of sector “i” in region “j” and the participation of the same sector in the national/regional total. It is calculated as:

$$Q^r = \frac{1}{2} \sum_{i=1}^n \left| \frac{V_{ij}}{\sum_{i=1}^n V_{ij}} - \frac{\sum_{j=1}^n V_{ij}}{\sum_{i=1}^n \sum_{j=1}^n V_{ij}} \right| \tag{3}$$

Its results are interpreted as:

If $Q_{ij} = 1$ it implies that the relative size of sector i in region j is identical to the relative size of the same sector in the entire State. It cannot be said that there is regional specialization in this activity.

If $Q_{ij} \geq 1$ The relative size of the sector is greater than in the country as a whole. There is specialization in economic activity i

If $Q_{ij} < 1$ It would be showing that in the region the relative size of the sector is smaller than in the country. There is no specialization in economic activity i . The greater the Q_{ij} , the greater the specialization.

Results

The first results show that the Participation of the Region in the Sector (P_{ji}) using the data from the 2019 Economic Census of the State of Hidalgo of the Employed Personnel (PO) variable yields the following data shown in Table 3.

Table 3 Level of participation sector in the state

Percentage participation of the sector in the region	Sector
46-Retail trade	29.60%
31-33-Manufacturing industries	26.30%
72-Temporary accommodation and food and beverage preparation services	10.60%
81-Other services except government activities	7.90%
43-Wholesale trade	5.20%
61-Educational services	3.70%
56-Business support services	3.20%
62-Health and social assistance services	3.10%
48-49-Transport, mail and storage	2.50%
23-Construction	2.10%
54-Professional services	1.90%
53-Real estate services	1.10%
71-Cultural leisure services	1.00%
52-Financial and insurance services	0.80%
51-Information in mass media	0.50%
21-Mining	0.40%
11-Agriculture	0.30%
22-Electricity	0.00%
Total	100%

Note: Own elaboration

Regarding the results of the Participation of the Municipality in the Sector (P_{ji}), as shown in Table 4, the level of participation of each municipality is observed.

Among the most important findings in Tables 3&4, we observe that participation is concentrated in 3 activities:

- 1) Manufacturing industries. The three main municipalities with the highest percentage of participation are Ajacuba with 68%, Atitalaquia with 67%, and Tepeapulco with 63%.
- 2) Temporary accommodation and food and beverage preparation services: Cardonal stands out in order of participation with 82%, Mineral del Chico with 47%, Huasca de Ocampo with 45% and Tecozautla with 29%.
- 3) Retail trade. The municipalities of Pacula stand out with 70%, Epazoyucan with 66% and El Arenal with 65%.

To complement the previous information, the specialization coefficient was calculated. (QR) whose results are seen in Table 5.

Table 4 Level of participation municipality- sector

Municipalities	31-33 Manufacturing Industries: Level of Participation of the region in the Sector
Ajacuba, Atitalaquia, Atotonilco de Tula, Tepeapulco, Tepeji of the Ocampo River, Tianguistengo, Tizayuca, Tlanalapa, Tolcayuca, Yahualica, Zacualtipán de Ángeles	35% ≤ P_{ji} ≤ 68%
Municipalities	72-Temporary accommodation and food and beverage preparation services
Cardonal, Huasca de Ocampo, Boy's Ore, Tecozautla	29% ≤ P_{ji} ≤ 82%
Municipalities	46-Retail trade
Rest	24% ≤ P_{ji} ≤ 70%

Note: Own elaboration

Table 5 Specialization Coefficient by Municipality (QR)

Municipalities	QR	Municipalities	QR	Municipalities	QR	Municipalities	QR
Cardonal	0.78	Tianguistengo	0.33	Tezontepec de Aldama	0.24	Huehuetla	0.19
Eloxochitlan	0.51	Mineral del Monte	0.33	Xochiatipan	0.24	Obregón Progress	0.19
Boy's Ore	0.48	Chilcuautila	0.32	San Agustín Metzquititlán	0.24	Acaxochitlan	0.19
Lolotla	0.47	Omitlán de Juárez	0.32	Singuilucan	0.24	Pachuca de Soto	0.19
Tepehuacan of Guerrero	0.45	ticket	0.32	Francisco I. Madero	0.24	Tolcayuca	0.19
Ajacuba	0.44	Calnali	0.31	Iturbide White Water	0.23	Emiliano Zapata	0.18
Pacula	0.44	Tepetitlan	0.31	Tetepango	0.23	Alfajayucan	0.18
Xochicoatlán	0.44	Chapulhuacan	0.31	Tlanalapa	0.22	Huejutla de Reyes	0.17
Huasca de Ocampo	0.43	Atlapexco	0.3	Doria Tenango	0.22	San Felipe Orizatlán	0.17
Atitalaquia	0.43	Jaltocan	0.3	Meteppec	0.22	Villa of Tezontepec	0.16
Tlahuiltepa	0.42	Tlanchinol	0.29	Zempoala	0.22	Chapantongo	0.16
Tecozautla	0.4	Zimapan	0.29	San Agustín Tlaxiaca	0.21	Tulancingo de Bravo	0.15
The mission	0.39	Molango de Escamilla	0.28	Tula de Allende	0.21	Zapotlán de Juárez	0.15

Table 5 Continued...

Municipalities	QR	Municipalities	QR	Municipalities	QR	Municipalities	QR
Tepeapulco	0.38	Metztitlan	0.28	Nicholas Flores	0.21	Mixquiahuala de Juárez	0.13
Epazoyucan	0.37	San Bartolo	0.27	Nopala de Villagran	0.21	Tlaxcoapan	0.13
El Arenal	0.36	Tutotepec	0.27	Huautla	0.21	Huichapan	0.13
Yahualica	0.34	Juarez Hidalgo	0.27	Atotonilco the Great	0.21	Cuautepec de Hinojosa	0.12
flower press	0.34	San Salvador	0.27	Tizayuca	0.2	Santiago Tulantepec of Lugo Guerrero	0.11
Tepeji of the Ocampo River	0.33	Santiago de Anaya	0.26	Ixmiquilpan	0.2	Ore of the Reform	0.11
Acatlan	0.33	Tlahuelilpan	0.26	Almoleya	0.2	Apan	0.09
Huazalingo	0.33	Jacala de Ledezma	0.25	Atotonilco of Tula	0.19	Actopan	0.06
		Zacualtipan de Ángeles	0.25				

Note: Own elaboration

Discussion

The economic performance of companies is essential to give economic impetus to the region¹⁵ Based on the results, the State of Hidalgo needs strong support from the industrial sector since manufacturing activities are concentrated in only 12 municipalities, which represents 15% of the total municipalities. The same does not happen with tourist activity since it is concentrated in only 4 municipalities, that is, 4.7% of the State's total. The rest of the municipalities (68) live off small businesses. In this sense, convergence is fundamental for local economic development as pointed out by.¹⁶ We see that 62 cents of each peso produced comes from the tertiary sector. In this context, it is worth noting the proposal of¹⁷ in the sense of government participation to contribute to a more balanced economic development of the State.¹⁸

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None.

Conflicts of interest

The authors declare that there is no conflict of interest.

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