INCOME INEQUALITY AND TOURISTIC RESOURCES IN URUGUAY: A SPATIAL APPROACH°

DESIGUALDAD DE INGRESOS Y RECURSOS TURÍSTICOS EN URUGUAY: UN ENFOQUE ESPACIAL

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Abstract

It is known that the endowment of natural and built amenities affects tourism development directly, but it is less known how the allocation and distribution of amenities in a country could generate regional disparities in income distribution. The aim of this study is to explore regional inequalities in wages and their relationship with the development of tourism in Uruguay. We built four indices of touristic amenities (land-based natural amenities, water-based natural amenities, cultural-historical amenities, and recreational amenities) and then interact them with tourism employment, as a proxy for tourism development for the period 2006-2019. In addition, we estimate a spatial error model to analyze the relationship between income inequality and tourism development. The evidence suggests that there are some regional disparities in income distribution in the tourism sector. Also, some specifications of the econometric models show a positive relationship between employment in activities related to tourism and inequality in labor income, and that the departments with cultural-historical amenities tend to have a more equalitarian distribution of labor income.

Resumen

Si bien es conocido que la dotación de recursos naturales, culturales y recreativos contribuye directamente el desarrollo del turismo, existe un desconocimiento sobre cómo la asignación y distribución de recursos en un país puede afectar las disparidades económicas regionales. El objetivo de este trabajo es explorar las desigualdades regionales en los salarios y su relación con el desarrollo del turismo en Uruguay. Se construyen cuatro índices de amenidades turísticas (amenidades naturales terrestres, amenidades naturales basadas en el agua, amenidades histórico-culturales y amenidades recreativas) y se computa su interacción con el empleo turístico, como un indicador del desarrollo turístico para el período 2006-2019. Además, se estima un modelo de error espacial para analizar la relación entre la desigualdad económica y el desarrollo en turismo. La evidencia sugiere que existen algunas disparidades regionales en la distribución del ingreso en el sector turismo. Adicionalmente, algunas especificaciones del modelo econométrico muestran una relación positiva entre el empleo en actividades relacionadas con el turismo y la desigualdad de ingresos laborales y que los departamentos con amenidades histórico-culturales tienden a tener una distribución de ingresos laborales más igualitaria.

Palabras clave: desarrollo orientado a las amenidades, distribución del ingreso, desarrollo regional, econometría espacial, empleo relacionado con el turismo, desarrollo turístico.
Códigos JEL: R1, L8, J4.

INTRODUCTION

Tourism is a source of employment, income, and regional development. Some economies have trusted for years in the development, promotion, and encouragement of this activity. While different types of tourism are emerging, and consumers are increasingly demanding personal experiences based on touristic resources instead of contemplating them, a new paradigm of possibilities of regional growth is arising. Natural, cultural, or built touristic resources and amenities are the key inputs in the tourism industry, and they could have an impact on income distribution and employment in tourism (Marcouiller, Kim & Deller, 2004; Porto & Espinola, 2019; Roback, 1988; 1982).

At the same time, several studies have argued that the tourism sector is mainly characterized by jobs that require relatively low levels of schooling, few skills, and exhibit unfavorable conditions such as higher levels of informality, short average tenure, and gender segregation (Ashworth, 1992; Lee & Kang, 1998; Delfim Santos & Varejão, 2007; Blake, Arbache, Sinclair & Teles, 2008; Muñoz-Bullón, 2009; Espinola, 2016; Porto & García, 2022; García & Porto, 2021). In this way, these activities related to tourism are characterized by lower relative wages as compared to the local economy's average.

These features, through regional tourism development, might affect the average level of regional or local wages and income, and consequently, regional income distribution. Nevertheless, empirical evidence is ambiguous, and results from the literature are not conclusive. While some authors have shown that tourism development enhances income inequality, others found that tourism development contributes to regional economic convergence (Li, Chen, Li & Goh, 2016). An argument that links tourism development with income inequality is the concept of cultural and creative cities. Creative cities base their local development plan on cultural industries, and empirical studies have found that they are associated with higher levels of income inequalities (Florida, 2002; 2017; Donegan & Lowe, 2008). It implies that cultural amenities could be associated with greater levels of income inequality. Regarding natural amenities, it has been argued that they constitute an attraction for certain types of individuals that tends to increase incomes in the region, anchoring cities to high income over time and resulting in a persistent spatial distribution of income. In this way, the allocation and distribution of amenities in a country could generate regional disparities in income distribution due to tourism.

Uruguay is a small country of around 3.5 million inhabitants in a 175 thousand km^2 area, where the tourism sector represented 3.1% of GDP in 2019 (INE,

2021) and 7.2% of total employment (Ministry of Tourism of Uruguay, 2019b). In 2018, visitors' expenditures represented 18.8% of goods exports and 43.9% of services exports (Ministry of Tourism of Uruguay, 2019a). This share more than doubles the share of tourism on exports in the Latin American region, which makes Uruguay a tourism-specialized country.

Although the country is mainly attractive for tourists due to its natural resources, the Metropolitan region (where Montevideo, the capital of the country, is situated) is mainly recognized as a recreational and cultural destination. The beach in Punta del Este is known as one of the main beach resorts in South America and offers great scenery for practicing water sports and outdoor activities. Other places, such as Colonia del Sacramento and Fray Bentos in the Littoral region, are also distinguished for their historical and cultural heritage, even recognized as World Cultural Heritage by UNESCO. In this way, the distribution of tourist amenities along the country exhibits some regional disparities.

Considering data from 2000 to 2019, nearly 24% of international tourists have traveled to Punta del Este city, the most famous sun destination, and more than 30% to Montevideo, the capital of the country. Regarding domestic tourism, these regions –East and Metropolitan– were also the main destinations in 2018, with a share of about 35% each (Ministry of Tourism, 2019a). It is not surprising then that tourism employment represents an important share of total employment in those regions. In 2019, the share of tourism jobs in total employment was 8.8% in the East and 7.4% in the Metropolitan region, above the shares in other regions and in the whole country (Ministry of Tourism, 2019c).

In this context, one relevant issue is how the employment and income generated by the tourism sector are distributed within the country. Is it distributed equally or is there a geographical concentration of tourism incomes? And what is the link between this distribution and the allocation of amenities? It is recognized that tourism, if managed well, can be an important channel through which sustainable development can be achieved, and knowing the reality of each region could help to face the challenges of the new era of tourism.

The aim of this study is to explore the relationship between regional inequalities and the development of tourism in Uruguay for the period 2006-2019. Following Porto and Espinola (2019), we build touristic amenities indices and estimate a spatial econometric model to account for this relationship.

The structure of the article is as follows. Section I presents a brief review of the literature. Section II includes a characterization of employment in tourism based on summary statistics of variables at the individual level and Section III describes the methodology to explore the relation between a departmental endowment of touristic amenities and income distribution in the tourism sector. Section IV presents the results and Section V concludes.

I. LITERATURE REVIEW

Literature has largely studied the regional distribution of tourism regarding income inequalities and, to a less extent, related to the endowment of the different types of touristic resources. Some studies show how the employment tourism sector features affect the average level of regional or local wages and income (Ashworth, 1992; Lee & Kang, 1998; Delfim Santos & Varejão, 2007; Blake et al., 2008; Muñoz-Bullón, 2009; Nyaruwata & Tendayi Nyaruwata, 2013; Espinola, 2016).

Alam and Paramati (2016), focusing on 49 developing economies around the world, found that tourism significantly increases income inequality. The reason may be the oligopolistic market structure since most tourism services providers are a few multinational corporations, which leads to greater inequalities. Göymen (2000) and Seckelmann (2002) also found that regional inequality in Turkey is increased by tourism since most investments and public policies are focused in that sector. Similarly, Carrascal Incera and Fernández (2015) showed that tourism consumption contributes to income inequality in some regions of Spain by benefiting high-income households more than low-income ones. Njoya and Seetaram (2018) affirmed that tourism in Kenya benefits the poor, but its impact is higher in urban than in rural areas. For the case of China, Zhao and Xia (2020) and Shi, Luo, Jin, Cheng and Li (2020) found that tourism reduces poverty in western provinces, but it has a negligible effect in eastern ones mainly due to the differential impact on poor households from rural areas. On the contrary, other authors supported the notion of a positive effect of tourism on income distribution (Lee & Kang, 1998 for South Korea, and Marcoullier & Xia, 2008 for the United States). Li et al. (2016) identified that the tourism development contributes to regional economic convergence in China, through a spatiotemporal model. Chi (2020) found that the long-run relationship between tourism revenue and income inequality can differ across developed and developing economies. Fang, Gozgor, Paramati and Wu (2020) investigated the effects of tourism indicators on income inequality for a sample of 102 countries, with annual data from 1995 to 2014. Using different techniques of estimation, they concluded that tourism indicators have a significant

negative impact on income inequality in developing economies, while they have an insignificant impact in developed economies.

In addition, literature has focused on the role of a region's endowment of amenities in income distribution. Both natural and built amenities directly affect tourism activities, thus having a strong impact on income generation of tourism (Marcouiller et al., 2004; Roback, 1988; 1982). However, there are different theories about the impact of touristic amenities on income distribution (Goe & Green, 2005; Kuentzel & Ramaswamy, 2005). Although amenities play a key role as inputs in the tourism industry, attracting visitors and encouraging touristic infrastructure investments, this might reinforce geographical inequalities, while the unfavorable conditions of jobs in this sector might lead to enlarged inequalities within a region.

Literature has also identified different effects on income distribution according to the type of amenities considered. Natural amenities are recognized as important growth determinants, favoring regions endowed with valuable natural resources. It has also been argued that natural amenities provide an attraction for highly educated, mobile, and dependent on technology individuals, which is more likely to be related to higher incomes (Marcouiller et al., 2004). Moreover, natural amenities –when they are persistent– are believed to anchor cities to high income over time and to exhibit a persistent spatial distribution of income (Lee & Lin, 2017). At the same time, the seasonal and low-skilled nature of these jobs might reinforce income inequalities.

The determinant role of natural amenities in income distribution was assessed by many empirical studies. Marcouiller et al. (2004) found that certain types of amenities in United States (mainly, water-based amenities) are associated with a more equal income distribution. The results of Lee and O'Leary (2008) based on nonmetropolitan counties of the United States, are that income inequality was positively related to benefits in the recreation and tourism industry; while English, Marcouiller and Cordell (2000) showed that recreation –and tourism– dependent counties have a higher average income, lower economic diversity, and higher household costs, as compared to other counties in the region. McGregor and Willis (2019) argued that natural amenities are strongly associated with local economic development. On the contrary, Gunderson and Ng (2005) found that the average per capita income in tourism-dependent counties is lower than in non-tourism-dependent counties.

Regarding built amenities, both historical and recreational constitute attractions for visitors, thus increasing demand for tourism services in the regions where

they are placed and then contributing to their economic growth. But there is a wide literature that argues that certain types of cities, which base their local development plan on cultural industries, are associated with higher levels of income inequalities (Florida, 2002; 2017; Donegan & Lowe, 2008). Besides, these types of amenities tend to be concentrated in urban areas, reinforcing regional inequalities. It has also been pointed out that restaurant meals and non-durable entertainment amenities are mainly placed in downtown areas of major cities (Couture & Handbury, 2017), which attracts higher-income households, increasing house prices in those areas and then making the poor worse off (Couture, Gaubert, Handbury & Hurst, 2020). However, some types of museums and heritage sites are often spread over many rural and non-metropolitan areas (Bertacchini, Nuccio & Durio 2021). Many studies have recognized the role of proximity tourism –that is, leisure and entertainment activities within home regions, involving nearby destinations and short distances (Jeuring & Diaz-Soria, 2017)– in reducing the gap between urban and peripherical areas (Salvatore, Chiodo & Fantini, 2018), Consequently, the placement of museums, heritage and historical sites in peripherical areas could offset the inequalities generated by other types of amenities. Also, certain type of visitors has a special interest in exploring rural villages with historical heritage (Royo-Vela, 2009), hence the impact of cultural amenities on regional inequality might be ambiguous.

Porto and Espinola (2019) is the only study that explores the relationship between tourism employment, income distribution and endowment of amenities for a country in Latin America. Using data of 29 urban agglomerates in Argentina during the period 2004-2015, they examine the impact of touristic amenities in wages inequality. Results suggest that labor income distribution depends on the natural resources endowment, as well as the development of tourism in the agglomerates.

II. DATA

II.1 Tourism employment and tourism development in Uruguay

We use data from the Continuous Household Survey (Encuesta Continua de Hogares, ECH, Spanish acronym) conducted by the National Institute of Statistics of Uruguay. It has national coverage since 2006, thus allowing for the spatial analysis to cover both urban and rural departments until year 2019[1].

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[1]   We did not include the years 2020 and 2021 for the following reasons. Firstly, although data from

We define the sensitive tourism employment as that of any establishment whose primary economic activity is any of the following: 1) accommodation services, 2) restaurants, 3) travel agencies and complementary touristic support services, and 4) entertainment, cultural and sport services[2,3]. This definition has been common in literature (Espinola, 2016; Porto & Espinola, 2019; United Nations & UNWTO, 2010). Also, alternative definitions of tourism activities were tested and the results did not change much.

The tourism sector accounts for around 5.6% of total employment[4] while non-tourism services' employment represents 57.3% (Table 1). Regarding socio-economic characteristics, the share of women on total workers is significantly lower in tourism sector as compared with the non-tourism sector, and workers in tourism sector are on average younger (more than two years of difference). Also, they have fewer years of formal education (the difference is close to a year) and almost half of workers in the sector (49.3%) have secondary incomplete as their maximum educational level achieved. In the non-tourism sector this share is about 39%, with more than 18.4% of workers with superior complete (6.2% in the tourism sector). The results are in line with international evidence (Delfim Santos & Varejão, 2007, for Portugal; Muñoz-Bullón, 2009, for Spain; and Espinola, 2016, for Argentina).

Regarding labor conditions, tourism sector also shows a more disadvantaged environment than the non-tourism one, since it exhibits significantly higher informality rates[5] and it is more concentrated in small and mid-sized firms. If we

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the 2020 and 2021 surveys are available, they were not comparable with the series because of the methodological changes introduced since the pandemic: the survey is carried out by phone rather than in person, the questionnaire has been reduced (with some answer categories changed) and the sample has been replaced by a rotative panel, including a sub-sample of previous samples. For this reason, these surveys were discard for this study. Secondly, in these years the tourism sector presented a particular behavior due to the health emergency that could introduce a wrong reading to the analysis proposed in this study.

2   We exclude the transport service sector in our analysis. Although the surveys allow for identifying jobs in the sector, for years prior to 2012, activities in the survey were classified following ISIC Revision 3, which does not allow for distinguishing between passengers' and freight transport.

3   The non-tourism sector includes the rest of service activities: education, health, financial services, public administration and defense, domestic services, wholesale and retail trade, freight transport service, real estate activities, computing and communication, professional, scientific and technical activities, others administrative activities and support services; and rest of economy includes the remaining activities (mainly those in primary and secondary sectors).

4   This figure is consistent with the 7.2% reported in the Introduction based on the Ministry of Tourism data, since the last one accounts for "touristic jobs", which exceeds the number of workers in touristic sector given that one person might have more than one job.

5   A worker is considered informal if (s)he does not have the right to a pension when retired.

consider occupational qualification, the results are consistent with those related to education (more than 76.8% of workers in tourism perform tasks as operators or unskilled workers versus 68.8% in the non-tourism sector)[6]. The tourism sector shows the lower monthly income and hourly wages, compared to the rest of the sectors and the economy as a whole.

Table 1. Main labor and socio-economic characteristics of employees, by employment sector, 2006-2019

	Employment			Mean	
	Tourism	Non Tourism	Rest of Economy	Total	diff. (T-NT)
Share of employed (%)	5.62	57.35	37.03	100.00	
Share of women (%)	46.84	55.95	26.07	43.11	-9.11**
Age	38.37	40.97	41.25	40.97	-2.61**
Years of education	10.14	11.04	8.80	10.10	-0.9**
Maximum educational level (%)					
Until primary complete	17.48	17.22	35.50	24.22	0.26
Secondary incomplete	49.30	39.07	43.25	41.75	10.23**
Secondary complete	15.13	13.95	9.65	12.40	1.18**
Superior incomplete	11.89	11.31	6.01	9.25	0.58**
Superior complete	6.19	18.44	5.54	12.36	-12.25**
Informality (%)	30.52	19.98	32.83	25.83	10.54**
Monthly labor income [(1)]	12 274	14 786	13 659	14 126	-2 512**
Weekly hours of work	38.84	38.82	41.81	40.22	0.01*
Hourly wage [(1)]	79.59	94.20	78.42	86.31	-14.61**
Part time employment (%)	16.76	14.54	11.82	13.49	2.22**

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[6]   We classified occupations that involves tasks as managers or professionals into the professional category, technicians and associate professionals into technician, elementary occupations into unskilled, and the rest of occupations into operators.

Size of firm (%)					
< 10 employees	48.72	44.85	58.19	50.67	3.87**
Between 10 and 50 employees	23.87	12.47	15.48	14.24	11.4**
> 50 employees	27.41	42.68	26.33	35.08	-15.27**
Ocupational qualification (%)					
Professional	12.72	22.01	5.89	14.97	-9.29**
Technician	10.40	9.11	4.15	7.12	1.29**
Operator	60.66	50.55	67.06	58.24	10.11**
Unskilled	16.22	18.33	22.90	19.67	-2.11**
Number of obs.	38 178	389 009	269 976	697 163	

(1) Monthly income and hourly wages from mean activity at prices of 2010.
* Significant at 5%; ** significant at 1%.
Source: Own calculations based on SEDLAC (CEDLAS and the World Bank) and ECH, 2006-2019.

A brief regional characterization of Uruguay is presented in Table 2 and Figure 1. Uruguay is divided into 19 states ('departamentos') with different characterics. Population density is over 2600 inhabitants/km^2 in Montevideo while it is about 20 inhabitants/km^2 for the whole country. Regarding social welfare, Montevideo has the lowest share of the population (less than 27%) with at least one unsatisfied basic need (UBN) (Table 2).

Figure 1 describes the regional endowment of amenities and the main touristic attractions type in each department[7], which define the regional tourism development of Uruguay. Amenities are a key input for tourism production, generation of employment, and income. Following Porto and Espinola (2019) and based on specialized literature (Deller, Tsai, Marcouiller & English, 2001; English et al., 2000; Marcouiller et al., 2004), we developed four indices of touristic amenities for each department: land-based natural amenities, water-based natural amenities, cultural-historical amenities, and recreational amenities. These indices were computed as an arithmetic average of a set of standardized variables in each category. These variables were built from a comprehensive search of data in national, regional and local sources, both governmental –such as the National Institute of Statistics, Ministry of Tourism, Ministry of Agriculture, Livestock and Fishing, Ministry of Culture and Education, Ministry of Environment, Uruguayan Institute of Meteorology,

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7   A description of the main touristic attraction is presented in the Appendix.

among others– and non-governmental ones –Uruguayan Football Association and touristic and local websites such as "Portales del Uruguay", "WelcomeUruguay. com", "Montevideo Portal", among others–. A detailed description of how indices were computed can be found in Porto and Espinola (2019).

A region constituted by Salto, Paysandú and Tacuarembó is mainly characterized by having recreational amenities, as well as Flores and Montevideo. We can also perceive a cultural region in the area of Durazno, Florida and Lavalleja, and also in Soriano and Colonia. Water-based amenities are mainly concentrated in Southern Interior region, while land-based ones are the main attributes in Northeast states.

Table 2. Characterization of states in Uruguay. Main indicators

| State	Surface (km2)	Population (*)	Population Density	UBN (**)
Artigas	11 928	74 075	6.2	54.4%
Canelones	4 536	603 750	133.1	33.6%
Cerro Largo	13 648	89 630	6.6	44.8%
Colonia	6 106	131 297	21.5	30.3%
Durazno	11 643	58 975	5.1	42.0%
Flores	5 144	26 485	5.1	28.6%
Florida	10 417	69 324	6.7	32.2%
Lavalleja	10 016	58 699	5.9	33.6%
Maldonado	4 793	195 005	40.7	34.5%
Montevideo	530	1 383 135	2 609.7	26.8%
Paysandú	13 922	119 882	8.6	41.4%
Río Negro	9 282	58 308	6.3	38.9%
Rivera	9 370	109 039	11.6	45.4%
Rocha	10 551	74 238	7.0	35.0%
Salto	14 163	133 707	9.4	49.4%
San José	4 992	118 270	23.7	35.7%

Soriano	9 008	83 714	9.3	38.9%
Tacuarembó	15 438	92 894	6.0	45.2%
Treinta y Tres	9 529	50 485	5.3	41.1%
Total	175 016	3 530 912	20.2	33.8%

(*) 2020 projects.
(**) Percentage of population with at least one unsatisfied basic need (UBN), extracted from Calvo (coord, 2013).
Source: Own elaboration based on INE-Anuario Estadístico Nacional 2021, 98ª versión and Calvo (coord, 2013).

Figure 1. Main type of amenity per department in Uruguay
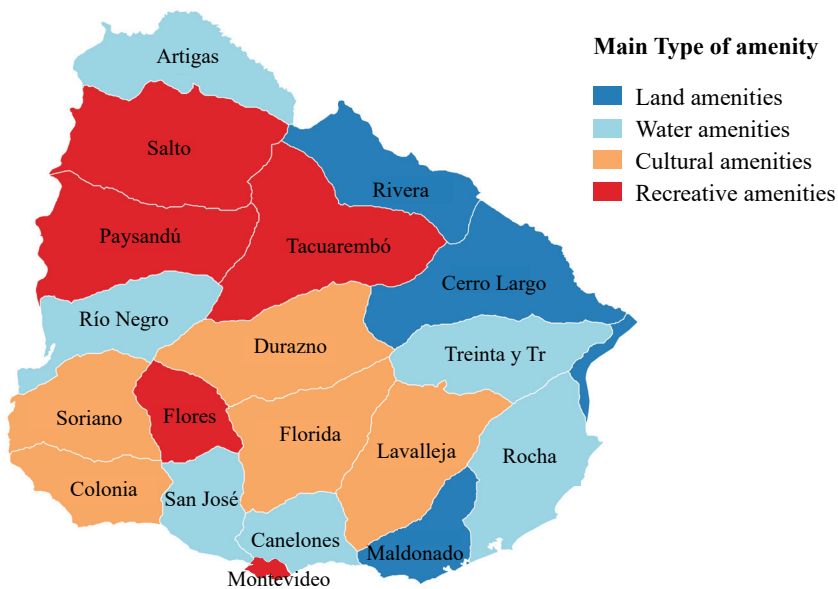
Source: Own elaboration.

II.2 Spatial analysis of tourism development, tourism employment and income distribution

In this section we perform a descriptive analysis in order to deep about data and the regional distribution of income and touristic resources. The Gini index measures the inequality among values of a frequency distribution (as the levels of income) and it is based on the comparison of cumulative proportions of the population against cumulative proportions of income they receive, and it ranges between 0 (perfect equality) and 1 (perfect inequality)[8].

Table 3 reports Moran's Index for the Gini coefficient and the touristic amenities indices in order to perform an Exploratory Spatial Data Analysis (ESDA). Moran's Index evaluates spatial autocorrelation based on both feature locations and feature values, simultaneously. Given a set of features and an associated attribute, it evaluates whether the pattern expressed is clustered, dispersed, or random. If the index takes positive values, it implies positive spatial autocorrelation, since each observation value and their neighboring values are similar. On the opposite, if it takes a negative value, it implies negative spatial autocorrelation. Results show that, for the Gini Index, the null hypothesis of the Moran's Index cannot be rejected: there is no spatial autocorrelation in income inequality. The index also suggests spatial autocorrelation in the endowment of amenities. For water-based and cultural-historical amenities, the association is positive –meaning that if a geographical unit has a high level and distribution of this type of amenities, its neighbors will also have a high level and distribution of them– while for land-based and recreational amenities the autocorrelation is negative, meaning that if a department has a high level and distribution of this attribute, its neighbors will have a low level of it. We also consider, as an accurate measure of tourism development, the interaction of each type of amenity with the share of tourism employment, in order to capture the relationship between amenities as inputs in the production and employment generated by tourism[9]. In this case, there is no evidence of spatial autocorrelation for the case of natural (land and water-based) amenities. Instead, cultural-historical

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[8] The index is not affected by changes in scale which implies, for example, that a lower (higher) observed inequality in one department as compared to a second would not respond to a relative situation of lower (higher) average labor income in the first department, but to a condition of lower (higher) relative inequality *per se*.

[9] For the choice of the tourism development indicator, we used a supply approach. Following the methodology of Porto and Espinola (2019), we used a proxy through the variable employment in the tourism sector in order to obtain coherence considering that the amenities variable is also a tourist supply variable, and that the available information of touristic receipts or arrivals (variables from a demand approach) did not present the disaggregation by geographical unit required for our study.

and recreational amenities appear to be spatially autocorrelated. In the former case, the link is positive, while in the latter it is negative.

The table also reports Geary's Contrast. This index lies between 0 and some unspecified value greater than 1. Values significantly lower than 1 demonstrate increasing positive spatial autocorrelation, whilst values significantly higher than 1 illustrate increasing negative spatial autocorrelation. Moran's I is a measure of global spatial autocorrelation, while Geary's C is more sensitive to local spatial autocorrelation. The conclusions arrived at with this index are generally the same as those revealed by Moran's I.

Table 3. Moran's Index for Gini coefficient and tourist amenities

| Variables	Moran's I	p-value	Geary's c	p-value
Gini Index	0.013	0.276	0.971	0.168
Land-based amenities	-0.091	0.000	0.893	0.003
Water-based amenities	0.085	0.000	0.847	0.000
Cultural-historical amenities	0.431	0.000	0.583	0.000
Recreational amenities	-0.107	0.000	1.106	0.000
Land-based amenities interacted with tourism employment	0.006	0.534	0.770	0.000
Water-based amenities interacted with tourism employment	0.013	0.270	0.928	0.044
Cultural-historical amenities interacted with tourism employment	0.452	0.000	0.555	0.000
Recreational amenities interacted with tourism employment	-0.174	0.000	1.140	0.000

Source: Own calculation.

The pattern of regional distribution of touristic amenities can also be observed in Figure 2, which shows Moran scatter plot (Anselin, 1995) for amenities. This plot is based in Moran's Index and the degree of linear association

between the value of a variable x in the spatial unit i and the spatially weighted mean of the neighboring values of variable x, W_x (or spatial lag) (Anselin & Bera, 1998). The Moran scatter plot can be divided into four quadrants to indicate different types of spatial association. Quadrants I and III represent positive spatial association because low-low and high-high values are associated, respectively. Quadrants II and IV indicate negative spatial association because high-low and low-high values are associated, respectively.

These estimates support the hypothesis that the amenities are not randomly located, but they could present a spatial association, suggesting that the use of a SEM may be accurate. As mentioned above, in the model it was decided to use the interaction between amenities and tourism employment as a proxy for development in tourism as a variable of interest. As can be seen in Table 3, the spatial autocorrelation, in general, is maintained for the interacting variables.

Figure 2. Moran scatter plot for types of amenities
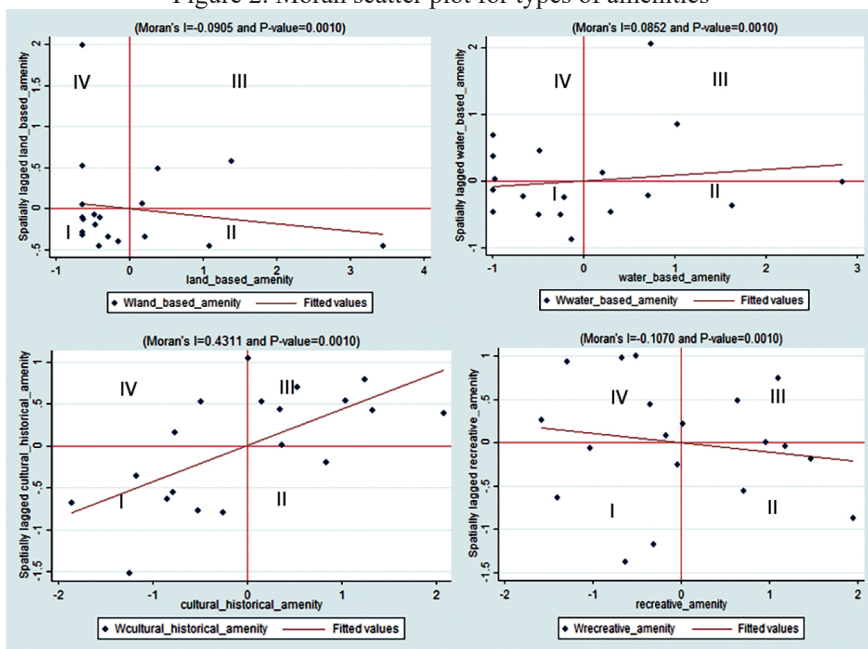
Source: Own elaboration.

The geographical pattern of income distribution, employment rates in tourism and the main type of touristic resources are presented in the Appendix (Figures A1 and A2, respectively). Although there are not clearly delimited regions with high or low values of income inequality, the area formed by Colonia, Flores and San José exhibit lower levels of income inequality as compared with the rest of the country. Also, Maldonado, where the main sun destination is located (Punta del Este), shows lesser inequality levels than other departments. On the opposite, departments in the interior regions (Durazno, Treinta y Tres, and Canelones) exhibit the highest levels of income inequality in Uruguay (Figure A1). Regarding tourism employment rates (Figure A2), a slightly clearer pattern can be distinguished. Southern-east departments such as Maldonado, Rocha, Cerro Largo, Lavalleja and Treinta y Tres hold the higher employment rates.

III. METHODOLOGY

We estimate a spatial error model (SEM) to explain the relationship between regional inequality and tourism development. The equation to estimate is as follows:

$$Gini_{it} = \alpha + \beta_k X_{it}^k + \gamma_i + \delta_t + \mu_{it} \qquad (1)$$

With

$$\mu_{it} = \lambda W u_{it} + \varepsilon_{it} \qquad (2)$$

The dependent variable is $Gini_{it}$, which resumes labor income inequality measured by Gini index in department i in period t, where i is one of the 19 departments that compose Uruguay, and t represents a year in the period 2006-2019. Matrix X_{it}^k comprises a set of $(k-1)$ supply-side determinants of wage inequality –such as individual, sociodemographic, and labor variables–, the share of tourism-based employment in total employment in each department, and interactions terms of amenities with the share of tourism-sensitive employment (that is, employment in a set of predefined activities that are related to tourism sector), as a proxy for tourism development.

The independent variables used in the model arise from the microeconomic theory of labor supply (Ashenfelter & Card, 2010; Mincer, 1970; Topel, 1994). The wages depend on the labor and personal conditions of the workers, and consequently, they could affect the labor inequality between and within the geographical areas. Each independent variable is expressed as the employed population share in

each agglomerate. β_k is the estimated coefficients of k variables, whereas γ_i and δ_t capture unobservable time-invariant departments effects (such as labor market policies, union presence, department size, and social and cultural characteristics) and unobservable temporal effects that are fixed or constant departments (*e. g.* national labor market policies, national juncture, outbreak, among others), respectively. Each μ_{it} is an error term that can be spatially autocorrelated, due to the possible spatial autocorrelation of amenities variables included in the model.

The SEM allows for the possible spatial autocorrelation in the error term (Kim, Marcoullier & Deller, 2005; Marcouiller et al., 2004). This is represented by equation (2), where ε_{it} is the uncorrelated error vector and it follows a $N(0, s^2)$ and the scalar λ is the spatial autoregressive coefficient to be estimated. A SEM includes a $(n \times n)$ positive and symmetric spatial weights matrix, W. The spatial weight matrix is often expressed as a first-order contiguity matrix for incorporating the values of variables in adjacent geographic areas. The elements w_{ij} of W are 1 when departments i and j are defined as neighbors and 0 when they are not neighbors.

The model is estimated through a fixed effects specification for panel data, since it involves a small number of groups corresponding to the 19 departments of Uruguay.

IV. RESULTS

Table 4 reports the estimation of the SEM. For the analysis of the relationship between regional tourism development and income inequality, two types of variables are introduced into the model: the share of tourism-based employment in total employment in each department (column 1), and the interaction between tourism amenities and tourism employment (columns 2 to 5 for the interaction term for each type of amenity separately, and column 6 for the inclusion of all the interactions terms). These interaction terms capture the effect of amenities-based tourism development.

Table 4. Estimation of the spatial error model

Variables	Dep. Var.: Labor hourly Income Inequality Index					
	(1)	(2)	(3)	(4)	(5)	(6)
Tourism employment	0.311 * (0.172)	0.300 * (0.173)	0.325 * (0.172)	0.417 ** (0.178)	0.343 * (0.177)	0.405 ** (0.181)
Land-based amenities*tourism		-0.119 (0.252)				-0.150 (0.266)

Water-based amenities* tourism			-0.185 (0.249)			0.0755 (0.288)
Cultural-historical amenities*tourism				-0.616 ** (0.288)		-0.644 ** (0.326)
Recreational amenities*tourism					-0.301 (0.418)	-0.0292 (0.454)
Men	-0.134 (0.110)	-0.141 (0.111)	-0.137 (0.110)	-0.144 (0.109)	-0.139 (0.110)	-0.152 (0.110)
Age_26_36	-0.261 ** (0.110)	-0.267 ** (0.110)	-0.263 ** (0.110)	-0.266 ** (0.109)	-0.270 ** (0.110)	-0.272 ** (0.111)
Age_36_50	-0.28 *** (0.111)	-0.29 *** (0.111)	-0.29 *** (0.110)	-0.28 ** (0.110)	-0.3 *** (0.112)	-0.29 ** (0.112)
Age_more50	-0.280 ** (0.133)	-0.284 ** (0.133)	-0.288 ** (0.133)	-0.291 ** (0.132)	-0.286 ** (0.133)	-0.29 4** (0.132)
Incomplete primary	-0.096 (0.147)	-0.099 (0.147)	-0.109 (0.147)	-0.117 (0.146)	-0.107 (0.147)	-0.117 (0.147)
Complete primary	-0.246 ** (0.106)	-0.245 ** (0.106)	-0.247 ** (0.106)	-0.227 ** (0.106)	-0.243 ** (0.106)	-0.224 ** (0.106)
Incomplete secondary	-0.282 *** (0.096)	-0.281 *** (0.095)	-0.286 *** (0.095)	-0.294 *** (0.095)	-0.290 *** (0.096)	-0.293 *** (0.096)
Complete secondary	-0.209 * (0.115)	-0.214 * (0.115)	-0.211 * (0.114)	-0.225 ** (0.114)	-0.217 * (0.115)	-0.233 ** (0.115)
Seniority	0.0155 *** (0.003)	0.0156 *** (0.003)	0.0156*** (0.003)	0.0168 *** (0.003)	0.0158 *** (0.003)	0.0171 *** (0.003)
Informality	0.0300 (0.06)	0.0311 (0.06)	0.0351 (0.061)	0.0430 (0.06)	0.0400 (0.062)	0.0439 (0.062)
Other sectors employment[1]	0.102 (0.07)	0.103 (0.07)	0.103 (0.07)	0.119* (0.07)	0.104 (0.07)	0.121* (0.07)
Lambda	-0.855 *** (0.162)	-0.868 *** (0.165)	-0.87 1 *** (0.164)	-0.831 *** (0.165)	-0.868 *** (0.163)	-0.840 *** (0.17)
sigma2_e	0.00031*** (0.00)	0.00031*** (0.00)	0.0003*** (0.00)	0.0003 *** (0.00)	0.00031*** (0.00)	0.0003 *** (0.00)
Observations	266	266	266	266	266	266
R-squared	0.035	0.036	0.037	0.042	0.045	0.043
Number of id	19	19	19	19	19	19

Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$
(1) It includes retail, industry and construction employment.
Source: Own elaboration.

The model of spatial autoregressive coefficient (lambda) is statistically significant showing that there is empirical evidence of the presence of spatial autocorrelation in the error terms. However, it has a negative sign, meaning that the residues of a department tend to be surrounded by neighbors with quite different residues. In the theoretical literature, there are some explanations for the presence of negative spatial autocorrelation. One of them is Myrdal's backwash effect (Myrdal, 1957), which implies that growth in one region is harmful to growth in neighbor regions since it may attract resources and skilled labor from neighbor regions and reduce their growth potential (Kao & Bera, 2016). A similar counterintuitive result was also found by Porto and Espinola (2019) for the case of Argentina. Other possible methodological explanations for this might be the diverse patterns of spatial autocorrelation in the different types of amenities observed in the ESDA (different spatial autocorrelation patterns depending on the amenities), or the existence of aggregation errors in the elaboration of amenities variables collected at the department level.

The results show that tourism has an unequal effect on labor incomes: the estimated coefficient is positive and statistically significant. As was previously discussed, this positive association may be related to the fact that jobs in tourism sector tend to be characterized by more unfavorable conditions. It also implies that the hypothesis of a "Kuznets curve" associated to tourism (Ghosh & Mitra, 2021), that is, that higher levels of employment in tourism are linked to lower levels of income inequality is not supported here.

If we consider the interaction between amenities and tourism employment, the model suggests that departments with cultural-historical amenities tend to have a more equalitarian distribution of labor hourly incomes at a 5% confidence level. On the contrary, there is no evidence of a relationship between other types of amenities and income inequality. In the data analysis, we observe that departments like Soriano and Colonia –both with cultural-historical amenities– have a high Gini Index and high tourism employment share.

The determinants traditionally used to explain wage inequality from the supply side have the expected signs. According to the theory of gender inequality, the participation of men in the labor market has a negative relationship with wage inequality, although in this case, it is statistically not significant. Regarding workers' age, results suggest that, in general, when the share of elder workers is higher, income distribution is more equalitarian. Conversely, seniority is associated with higher levels of inequality. A positive relationship between some education levels and income inequality is also observed: an increase in education levels may

demonstrate an equalizing factor in regional labor income distribution. The effect is statistically significant for the secondary degree (complete and incomplete) and complete primary degree (as compared with those who have a university education). Higher inequality is also related to the share of informal, although the estimates are not statistically significant.

DISCUSSION AND CONCLUDING REMARKS

In recent decades, tourism has become an important industry for most regional economies. It is known for its contribution to employment, income, and regional development. In Uruguay, the tourism sector represented 3.1% of GDP and 7.2% of total employment in 2019 (INE, 2021; Ministry of Tourism of Uruguay, 2019b). In addition, amenities are a key input for tourism production, generation of employment, and income. However, the relationship between tourism, amenities and inequality is not theoretically or empirically clearly defined. The present study is a first step to the study and exploration of regional inequalities and its relationship with the development of tourism and amenities endowment for the case of Uruguay.

The purpose of the study is to know and make visible the distributional impact of the tourism sector, mainly within the countries, in order to provide information to focus public policies from an equality perspective in the field of tourism. The relationship between regional inequalities and the development of tourism and amenities endowment was explored through a spatial economic analysis using a data panel at the department level for the years 2006-2019, using data from the Encuesta Continua de Hogares of Uruguay. For amenities endowment, we built four indices of touristic amenities (water, land, cultural-historical and recreative).

We found that differences in labor conditions exist between tourism and non-tourism sector and the spatial analysis suggested a possible association between income distribution and tourism employment in association with the endowments of touristic amenities in each region. Thus, the study's main finding is that a positive relationship between tourism sector and regional inequalities exists. The departments with the highest employment in tourism tend to have more unequal incomes than those departments with the least employment in tourism. This result is in line with the results obtained in other international studies (Nguyen, Schinckus, Su & Chong, 2021; Fang et al., 2020; Porto & Espinola, 2019).

The unequal distribution of income could be related, in part, to the negative characteristics of the pool of workers in the tourism sector, with low salaries, and

precarious working conditions summarized in informality, as shown in Table 1 and evidenced by several studies (García, 2020; Porto & Espinola, 2019; Porto & García, 2022; Espinola, 2016; Delfim Santos & Varejão, 2007; Muñoz-Bullón, 2009). In this sense, the Latin America region is experiencing a wave of promotion policies on employment seeking for mitigating effects and focusing on the development of quality of employment, innovative competencies, and smart initiatives. Several training programs on digital technologies have been implemented in Brasil, Chile, Colombia, and Costa Rica, including safety and hygiene in accommodation, digital marketing, web positioning, the development of technical careers such as Tourist Guidance, Community Recreation Technician, Camping Services Assistant and Ecotourism related training courses (Quicaña, 2021).

The key role of natural amenities in income distribution was also remarked on by previous studies (English et al., 2000; Lee & O'Leary, 2008; Marcouiller et al., 2004; Reeder & Brown, 2005). Besides, in relation to the amenities endowments, income regional inequality is lower in departments with cultural-historical amenities but not with natural amenities. These results contrast with those documented by Porto and Espinola (2019) for Argentina, where the natural amenities were statistically significant.

The negative association between cultural-historical amenities and income inequality should be taking into account in policymaking. Even though historical heritage cannot be reproduced, entertainment and cultural services can be developed. And, although we have not assessed causality, the results found might justify some efforts to promote developments in that direction, and infrastructure in those regions with an inequal income distribution as an attempt to improve it.

Regarding natural amenities, promoting rural tourism and nature tourism could be a way to move in the direction of a more equalitarian distribution of income, although nowadays there is no clear relationship in the case of Uruguay. Rural tourism has been one of the key elements of neoliberal social policies (Osorio González, Echeverría Cachipuendo & Thomé Ortiz, 2022). In Mexico, for instance, in recent years the national government has promoted rural tourism initiatives that directly or indirectly have impacted the use of land, valuing the cultural expressions of rural communities and indigenous peoples that have not previously worked in, nor for, the tourist activity. These initiatives include both the funding of specific entrepreneurship that take advantage of local attractions in the form of adventure or nature products and also the centralized funding from the federal government in the so-called "Magical Towns Program" ('Programa Pueblos Mágicos'), targeted to small populations, which have sets of tourist attractions and that are intended

to operate in a community manner (Osorio González, Echeverría Cachipuendo & Thomé Ortiz, 2022). This is also related to the community tourism concept, which emphasizes the role of local communities and territories as key elements of a model of tourism focused on cultural and natural endowments[10]. At the same time, natural tourism involves recreational activities in contact with nature with a conscious commitment to care for the environment. It has been particularly developed in Ecuador, but also in México, Dominican Republic and other Latin American countries. In Argentina, for instance, the Natural Route ('La Ruta Natural') is an example of a promotion and development program of nature tourism, with the explicit aim of promoting lesser-known circuits and destinations, articulating consolidated destinations with emerging destinations in integrated circuits, and improving the territorial and seasonal distribution of tourist activity. These experiences can serve as examples of policies applicable to Uruguay.

The study provides empirical evidence to existing literature regarding tourism employment and income distribution through a novel methodology that has been rarely applied in Latin American countries. Moreover, it constitutes the first study of tourism income distribution and the role of amenities in the case of Uruguay. It is important to highlight that the study uses the definition of tourism development from a supply approach; this is because the amenities are tourism supply variables, and to be consistent, the proxy variable that we consider is the employment in tourism. However, it is recognized that this approach may have some limitations. For example, the definition of tourism employment, which can be very broad and sometimes encompass sectors that generate tourism but also non-tourism employment. However, we use the traditional definition following the literature and the recommendations of the World Tourism Organization. (Espinola, 2016; Porto & Espinola, 2019; Muñoz-Bullon, 2009; United Nations & UNWTO, 2010). Additionally, we did different tests with changes in the definition of employment in tourism (excluding transportation, only with hotels and restaurants, etc.) and the results did not show significant changes. Complementarily, one interesting possibility is to consider an alternative indicator of tourism development from a demand approach, taking into account the regional distribution of touristic receipts or arrivals along the territory. It could also be thought of as a proxy for amenities understanding that tourism is attracted to zones where touristic resources are important. It might be likely that departments with a higher share of tourism tend to have higher levels of income, yielding a higher inequality between regions. However, the information is not available. The next research agenda considers incorporating

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[10] Cabanilla Vásconez (2018) presents an interesting analysis of this concept.

this type of indicator into estimations. Another extension of the study will be to analyze the possibility of improving amenity rates, adding more variables to detect the particularities of each department.

APPENDIX

Table A.1. A brief description of touristic attractions in each state

State	Touristic attractions
Artigas	It has a varied geography with low hills and valleys, including seven islands with jungle vegetation on the border with Argentina, which are part of the known missionary jungle. Between its natural tourist attractions, Piedra Pintada, a sandstone formation of 19 mts., is one of the most famous. It also has a great cultural mix, rich in diverse musical rhythms, being its carnival one of the most popular events.
Canelones	It is characterized by a slightly undulating and full of plains territory. One of its main touristic attractions is its nature (the area known as 'Costa de Oro' is one of the main beach destinations) and the traditions of the countryside. It also has a key historical role since it was one of the six jurisdictions into which the Oriental Province would be divided into in 1813, and its capital was the host of the first local government.
Cerro Largo	It is known by its cultural mix got from Brazilian influence, which can be easily noted from its famous carnival and 'spring dances'. Between its cultural attractions, the birthplace of famous poet Juana de Ibarbouru, become a museum can be mentioned.
Colonia	The main attraction in this state is the city of Colonia del Sacramento, which historic quarter has been declared a World Heritage Site by UNESCO in 1995. It also has a wide cultural offer including museums, theaters, art, handicrafts and local gastronomy.
Durazno	Many of its touristic attractions are located in its capital, the city of Durazno, which is known by its popular festivals and its beaches on the Yí River. Other of its attractions are the Hispanidad Park, the church of San Pedro Parish, Farruco Chapel and Durazno Biopark.
Flores	It is known by its nature, and where one of the two existing geoparks existing in South America, 'Gruta del Pacífico', is located. It also has a varied offer of adventure tourism, including a lake zone, but also cultural traditions related to rural establishments.

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Florida	It has a strong historical tradition since it was the place where the declaration of the country independence took place in 1825. It also lodges the National Sanctuary of the Lady of the Thirty Three Orientals, Patroness of Uruguay and Saint Conus, with a devout pilgrimage which comes from all the country.
Lavalleja	Its geography is characterized by a particular landscape of rolling hills. It is also attractive by its local traditions related to agricultural activities, and by its cultural events, such as the 'Festival Minas y Abril', the second biggest popular festival of the country. Other of its attractions is the 'Our Lady of Verdun National Sanctuary', one of the most visited sanctuaries in the country.
Maldonado	Its main touristic attraction is the beach of Punta del Este, an internationally visited destination. It offers many options for practising water sports and other outdor activities, but it also has cultural and historical attractions, as its lighthouse. The state also comprises other touristic destinations, such as Piriápolis, Punta Ballena, among others.
Montevideo	It constitutes a cultural, recreational and historical touristic attraction. Historical buildings such as the Cabildo, Iglesia Matriz and Puerta de la Ciudadela are visited by tourists from all over the world. The city of Montevideo was recognized as the Ibero-American Culture Capital by the Union of the Ibero-American Capital Cities (UCCI - Unión de Ciudades Capitales Iberoamericanas).
Paysandú	One of its main cultural attractions is the Beer Week, one of the most important touristic events of the country. It is also known by Guaviyu and Almirón hot springs, the Artigas Plateau and Quebracho Palm Groves.
Río Negro	The scenery of this state is composed by many areas of plentiful biodiversity. It also has cultural and recreational attractions, such as the Luis Alberto Solari Museum or Las Cañas beach resort. Another attraction is the city of Fray Bentos, were Liebig´s internationally famous meat packing plant was installed, becoming the first industrial establishment of Uruguay. The location of the industrial plant, the 'Fray Bentos Cultural-Industrial Landscape', was declared as World Heritage by UNESCO.
Rivera	It has many natural and cultural attractions, with great heritage, among which one of the most famous is Lunarejo Valley. Another place visited by tourist is the International Square, in Rivera city, built during the Second World War. It also has a wide offer of recreational services, including sports and shopping.
Rocha	It is known by its beach resorts, such as La Paloma, Cabo Polonio, Punta del Diablo, but also by its protected areas and national parks, like Santa Teresa, Laguna de Rocha and San Miguel.

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Salto	It is where the Argentinian-Uruguayan Salto Grande Dam is located. It is also famous by its hot springs, such as Daymán and Arapey, and lakes like Salto Chico. The city of Salto also offers recreational attractions such as the Zoo and aquatic parks.
San José	It has warm water beaches, some of the most famous are Kiyú, Playa Pascual and Boca del Cufré. Other of its natural attractions are 'Sierras de Mahoma', often called 'a sea of stone'. Among its recreational attractions, Parque Rodo and Maccio Theatre are some of the most visited.
Soriano	It has experienced a fast development of tourism in recent years. It has an attractive waterfront promenade in the city of Mercedes, were sports and nautical activities take place. It also offers cultural and recreational activities and places, such as the Mauá Castle, the Mercedes City Theatre and 'Nuestra Señora de las Mercedes' Cathedral.
Tacuarembó	Eden Valley and Cerro Batoví are two of its most visited natural attractions. Another place that attracts many tourists is Iporá, a resort bult around two artificial lakes. It is also embedded by a strong cultural and historical relevance, since it is the place where internationally recognized artists such as Carlos Gardel and Mario Benedetti were born.
Treinta y Tres	It constitutes a great attraction for adventure tourists, given its natural landscape and wildlife. It offers the possibility of great sightseen from 'Quebrada de los Cuervos' around Laguna Merin. It also offers cultural activities, such as the Folklore Festival of Olimar or La Charqueda Festival.

Source: Own elaboration

Figure A1. Average Gini Index per department in Uruguay. Year 2019
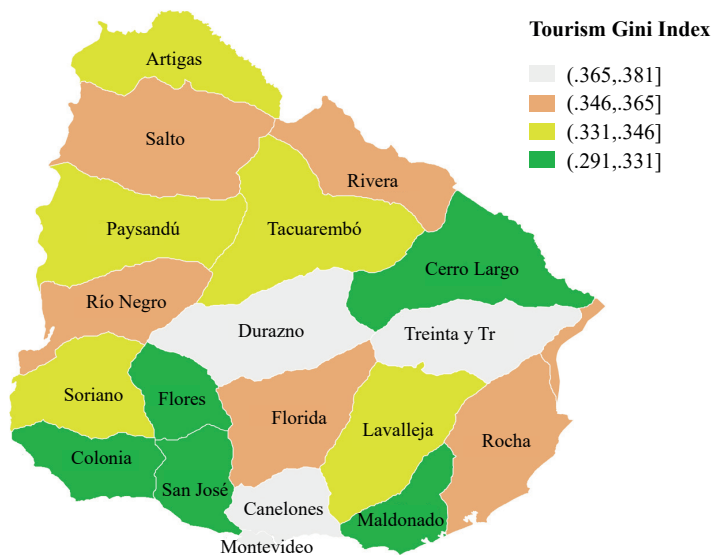
Source: Own elaboration.

Figure A2. Tourism employment rate per department in Uruguay. Year 2019
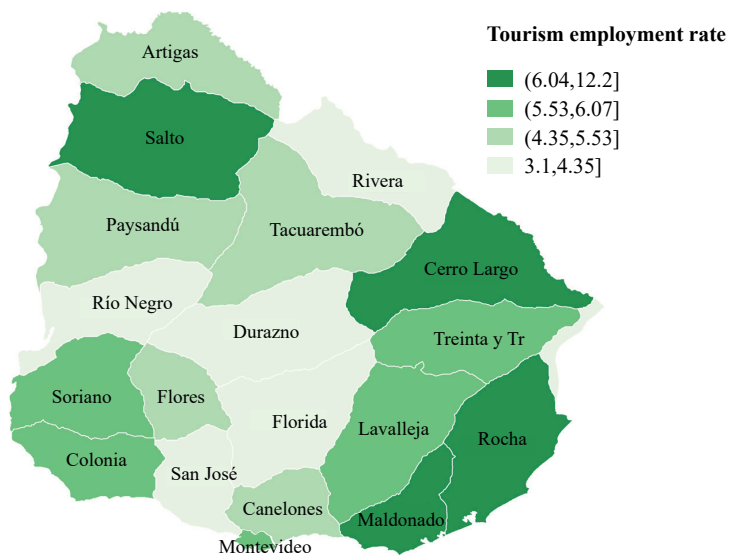
Source: Own elaboration.

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