Supplementary Material

Supporting data for the article "Tourism Dynamism without Demographic Recovery? The Socio-economic Evolution of the Villuercas-Ibores-Jara UNESCO Global Geopark (Spain, 2011–2025)". This file contains the tables and figures that document the data used in the main text and the robustness analyses cited there.

Table S1. Key socio-economic indicators by municipality (2011 and 2025)

UNESCO Global Geopark Villuercas-Ibores-Jara (n = 19 municipalities). The table reports eight indicators available in both the 2011 and 2025 editions of the Socioeconomic Atlas of Extremadura, seven of which are used as comparable between editions; the Industrial Index is reported for reference only (see Notes): total population, mean age, trend index, disposable household income per capita, registered unemployment rate, Industrial Index, total number of commercial activities and Social Welfare Index. The Accessibility and Educational Level indicators are excluded due to methodological heterogeneity between editions (see §3.2 of the main text); the educational dimension is reintroduced through Table S4 from SEXPE registers. Sources: INE (Padrón and MNP), IEEX — Socioeconomic Atlas of Extremadura (2011 and 2025 editions; registered unemployment as published in the Atlas). Author's own elaboration from the VIJ 2011–2025 database.

Municipality	Total population (inh.)		Mean age (years)		Trend index		Disp. income p.c. (€)		Unemployment rate (%)		Industrial Index		Commercial act. (no.)		Social Welfare Idx (index)	
	2011	2025	2011	2025	2011	2025	2011	2025	2011	2025	2011	2025	2011	2025	2011	2025
Aldeacentenera	754	602	49.4	51.2	46.4	81.3	11,673	12,167	16.2	6.3	4.5	1.8	11.0	14.0	103	96.5
Alía	998	722	54.0	56.8	52.4	109	11,076	12,567	13.5	11.2	58.5	0.1	21.0	25.0	91.7	92.8
Berzocana	520	375	50.8	56.9	63.6	83.3	11,594	12,329	12.8	13.0	3.0	0.1	13.0	13.0	95.7	106
Cabañas del Castillo	394	407	58.1	56.4	0.0	110	9,744	12,147	18.4	12.9	1.8	0.1	5.0	10.0	70.5	93.0
Campillo de Deleitosa	76	84	62.7	64.0	0.0	200	11,357	15,348	27.6	15.6	0.2	0.0	1.0	2.0	64.9	59.6
Cañamero	1,783	1,579	46.7	49.3	74.3	66.7	10,647	10,825	15.1	9.2	9.5	2.0	49.0	97.0	99.4	93.4
Carrascalejo	321	222	57.9	64.3	100	100	11,360	14,319	5.6	6.2	1.8	0.2	3.0	3.0	112	73.7
Castañar de Ibor	1,198	1,027	48.7	52.7	156	87.1	10,987	12,080	11.0	6.6	5.2	0.7	23.0	35.0	102	101
Deleitosa	834	686	51.4	53.8	69.2	60.0	11,640	12,758	12.2	8.7	2.7	1.4	23.0	25.0	105	110
Fresnedoso de Ibor	331	236	54.0	54.6	70.0	50.0	12,407	11,099	22.4	15.8	0.4	0.1	3.0	7.0	77.6	81.8
Garvín	97	111	54.3	48.9	0.0	28.6	9,267	10,597	32.2	15.5	0.0	0.0	4.0	1.0	66.1	88.0
Guadalupe	2,090	1,720	47.3	52.4	80.5	85.7	11,313	12,069	16.3	9.1	9.7	2.3	98.0	95.0	105	92.8
Logrosán	2,094	1,856	47.5	48.6	82.7	88.6	11,986	11,627	12.4	9.3	7.9	0.4	46.0	80.0	106	94.4
Navalvillar de Ibor	504	376	48.8	54.5	68.4	114	9,903	11,338	16.5	11.3	0.5	0.1	5.0	12.0	85.6	102
Navezuelas	697	668	45.4	51.0	77.4	221	9,184	10,648	13.3	3.7	1.8	0.7	18.0	15.0	87.7	91.2
Peraleda de San Román	283	269	58.7	56.7	25.0	33.3	10,048	12,762	22.4	15.0	0.3	0.2	9.0	6.0	84.1	103
Robledollano	386	325	52.3	57.3	50.0	80.0	9,348	11,669	18.2	7.9	0.8	0.2	8.0	16.0	74.9	101
Valdelacasa de Tajo	446	336	59.2	59.4	75.0	125	12,567	12,340	13.3	17.1	2.1	0.6	6.0	14.0	88.8	86.7
Villar del Pedroso	671	549	53.5	55.6	91.7	127	11,299	11,674	14.7	9.8	3.3	0.4	12.0	27.0	107	98.2

Notes. Trend index = (population aged 0–4 / population aged 5–9) × 100. The unemployment rate is registered unemployment as a share of the working-age population (15–64 in 2011, 16–64 in 2025). The Industrial Index and the Social Welfare Index are those published in the Atlas. The Industrial Index gives each municipality's share of the regional yield of the business tax (Impuesto sobre Actividades Económicas) on industrial activities (Extremadura = 10,000) and, in the 2025 edition, refers to 2023. As a relative share it can change abruptly in small municipalities (in Alía it falls from 58.5 to 0.1), so it is reported for reference only and is not used in the typology or in the assessment of the hypotheses. The Social Welfare Index is a synthetic index scaled to the regional mean (Extremadura = 100). In the 2025 edition, Campillo de Deleitosa (84 inhabitants) has no individual INE income value and carries a common value in the Atlas, so its income change is not an individual estimate.

Table S2. Annual cumulative new contracts by selected NACE-2009 branch

VIJ Geopark, December 2011 vs. December 2025. Annual cumulative contracts registered in the SEXPE offices covering the comarcal area. The top 12 NACE-2009 branches by joint weight in both years are reported. The NACE-2009 classification is common to both editions (the national revision in force 2011–2025), which preserves longitudinal comparability without remapping. Totals by branch are consistent with the sectoral aggregates cited in §4.2 of the main text (NACE 55+56). The source lists only the twenty divisions with most contracts in each year; division 78 is not among them in 2025 (n.r., not reported; n.a., not available). Shares of all contracts in §4.2 are computed over the totals of the source's table of contracts by sector (4,691 in 2011 and 4,738 in 2025; Table S8). Source: SEXPE Employment Observatory, labour market reports for the Mancomunidad Integral Villuercas-Ibores-Jara (the nineteen Geopark municipalities), December 2011 and December 2025; supplied by the SEXPE and published in aggregated form with its authorisation. Author's own elaboration.

NACE-2009 code	Branch of activity	Contracts 2011 (annual cum.)	Contracts 2025 (annual cum.)	Δ absolute	Δ %
01	Crop and animal production, hunting and related service activities	1,332	1,833	+501	+37.6 %
84	Public administration and defence; compulsory social security	319	609	+290	+90.9 %
43	Specialised construction activities	726	138	-588	-81.0 %
41	Construction of buildings	598	233	-365	-61.0 %
56	Food and beverage service activities	97	484	+387	+399.0 %
55	Accommodation	126	328	+202	+160.3 %
02	Forestry and logging	118	226	+108	+91.5 %
87	Residential care activities	116	181	+65	+56.0 %
88	Social work activities without accommodation	237	53	-184	-77.6 %
42	Civil engineering	125	150	+25	+20.0 %
25	Manufacture of fabricated metal products, except machinery and equipment	147	66	-81	-55.1 %
78	Employment activities	144	n.r.	n.a.	n.a.

Table S3. Structure of registered unemployment by age group and sex

VIJ Geopark. Comparison December 2011 vs. December 2025. Absolute values. Source: SEXPE Employment Observatory, labour market reports for the Mancomunidad Integral Villuercas-Ibores-Jara (the nineteen Geopark municipalities), December 2011 and December 2025; supplied by the SEXPE and published in aggregated form with its authorisation. For December 2025 the Observatory also publishes these data openly by municipality, sex and age. Author's own elaboration.

Age group	Men 2011	Women 2011	Total 2011	Men 2025	Women 2025	Total 2025
16–19 years	27	19	46	5	4	9
20–24 years	95	81	176	16	26	42
25–29 years	82	79	161	18	23	41
30–34 years	53	77	130	12	25	37
35–39 years	66	78	144	23	24	47
40–44 years	70	82	152	14	34	48
45–49 years	83	98	181	17	33	50
50–54 years	77	86	163	35	45	80
55–59 years	102	57	159	36	65	101
≥ 60 years	63	45	108	70	100	170
Total	**718**	**702**	**1,420**	**246**	**379**	**625**

Table S4. Structure of registered unemployment by educational level

VIJ Geopark. Registered unemployment by educational level and sex (absolute values and total 2011–2025 variation). Categories are ordered from the highest to the lowest educational attainment. This table supports the reincorporation of the educational dimension described in §3.2 of the main text, after the exclusion of the Atlas "Educational Level" indicator due to methodological heterogeneity between editions. Source: SEXPE Employment Observatory, labour market reports for the Mancomunidad Integral Villuercas-Ibores-Jara (the nineteen Geopark municipalities), December 2011 and December 2025; supplied by the SEXPE and published in aggregated form with its authorisation. For December 2025 the Observatory also publishes these data openly by municipality, sex and educational level. Author's own elaboration.

Educational level	M 2011	F 2011	Total 2011	M 2025	F 2025	Total 2025	Δ % Total
University (2nd/3rd cycle)	12	19	31	5	11	16	-48.4 %
University (1st cycle)	11	31	42	1	18	19	-54.8 %
Higher Vocational Training	19	35	54	18	30	48	-11.1 %
Intermediate Vocational Training	29	46	75	21	36	57	-24.0 %
Upper secondary (Bachillerato)	25	39	64	16	22	38	-40.6 %
Lower secondary (completed)	218	257	475	60	151	211	-55.6 %
Lower secondary (incomplete)	228	153	381	52	55	107	-71.9 %
Primary (completed)	62	38	100	26	24	50	-50.0 %
Primary (incomplete)	98	67	165	42	22	64	-61.2 %
No formal education	9	6	15	2	8	10	-33.3 %
Vocational integration programmes	7	11	18	3	2	5	-72.2 %
Total	**718**	**702**	**1,420**	**246**	**379**	**625**	**-56.0 %**

Table S5. Sensitivity of the municipal typology to alternative thresholds

Sensitivity of the municipal typology to the classification thresholds. Each threshold was varied while the others were held at all their values, giving 3 × 3 × 3 × 3 = 81 combinations: population loss for demographic collapse (−20, −25, −30 %), population change for near-stability (−3, −5, −7 %), commercial contraction for the stable regressive category (−40, −50, −60 %) and nominal income growth for regressive with economic resilience (10, 15, 20 %). The baseline (−25, −5, −50, 15) reproduces Table 2 for all 19 municipalities. Across the 81 combinations an average of 16.3 municipalities (86 %) keep their baseline category, at least 13 do so in every combination, all five categories occur in every combination, and 18 combinations reproduce the baseline exactly. Varied one at a time, the collapse threshold moves two municipalities at −20 % and four at −30 %; the stability threshold moves Navezuelas and Peraleda de San Román at −3 % and none at −7 %; the commercial and income thresholds move none. Source: author's own elaboration.

Municipality	Baseline category (Table 2)	Combinations keeping category (%)	Alternative categories observed
Aldeacentenera	Moderately regressive	67	Demographic collapse
Alía	Demographic collapse	67	Moderately regressive; Regressive with economic resilience
Berzocana	Demographic collapse	67	Moderately regressive
Fresnedoso de Ibor	Demographic collapse	67	Moderately regressive
Navalvillar de Ibor	Demographic collapse	67	Moderately regressive; Regressive with economic resilience
Navezuelas	Dynamic-resilient	67	Moderately regressive; Regressive with economic resilience
Peraleda de San Román	Dynamic-resilient	67	Regressive with economic resilience
Valdelacasa de Tajo	Moderately regressive	67	Demographic collapse
Cabañas del Castillo	Dynamic-resilient	100	—
Campillo de Deleitosa	Dynamic-resilient	100	—
Carrascalejo	Demographic collapse	100	—
Castañar de Ibor	Moderately regressive	100	—
Cañamero	Moderately regressive	100	—
Deleitosa	Moderately regressive	100	—
Garvín	Stable regressive	100	—
Guadalupe	Moderately regressive	100	—
Logrosán	Moderately regressive	100	—
Robledollano	Regressive with economic resilience	100	—
Villar del Pedroso	Moderately regressive	100	—

Table S6. Social security affiliation in NACE 55+56 by municipality, December 2025

Workers affiliated to the Spanish social security system in NACE divisions 55 (accommodation) and 56 (food and beverage service activities) by municipality, December 2025; underlying data for Figure 3c. The source replaces any component (general or self-employed scheme) below five affiliates with "<5"; such components are counted here at their minimum of one, so all values are lower bounds and the maximum uncertainty is three workers per suppressed component. Source: author's own elaboration from Ministerio de Inclusión, Seguridad Social y Migraciones, affiliated workers and contribution accounts by municipality and NACE division (file PRMU1225).

Municipality	NACE 55	NACE 56	NACE 55+56	All affiliated workers	Share of 55+56 (%)	Suppressed components
Guadalupe	116	82	198	552	35.9	None
Deleitosa	0	26	26	154	16.9	Some
Peraleda de San Román	0	6	6	44	13.6	Some
Campillo de Deleitosa	0	2	2	15	13.3	Some
Castañar de Ibor	1	26	27	226	11.9	Some
Berzocana	2	6	8	75	10.7	Some
Carrascalejo	0	5	5	53	9.4	Some
Cabañas del Castillo	1	8	9	100	9.0	Some
Alía	1	9	10	135	7.4	Some
Cañamero	6	29	35	484	7.2	Some
Valdelacasa de Tajo	0	5	5	71	7.0	Some
Logrosán	2	33	35	588	6.0	Some
Fresnedoso de Ibor	1	1	2	34	5.9	Some
Aldeacentenera	0	10	10	230	4.3	Some
Garvín	0	1	1	30	3.3	Some
Navalvillar de Ibor	0	2	2	60	3.3	Some
Villar del Pedroso	1	2	3	108	2.8	Some
Navezuelas	2	1	3	135	2.2	Some
Robledollano	0	1	1	117	0.9	Some
Comarca	133	255	388	3,211	12.1	

Table S7. Comarcal delimitations and values for La Siberia (notes to Table 3)

Additional notes to Table 3 of the main text. Source: author's own elaboration from the IEEX Socioeconomic Atlas of Extremadura, unfiltered provincial sheets for Cáceres and Badajoz, editions 2011 and 2025.

Item	Detail
Delimitation	Comarcas follow the IEEX territorial classification, under which each municipality belongs to a single comarca. This avoids double counting but differs from the administrative boundary of the Monfragüe Biosphere Reserve in two of fourteen municipalities: the IEEX comarca includes Cañaveral and Pedroso de Acim, whereas the Reserve includes Casatejada and Deleitosa, the latter assigned here to the VIJ.
Income coverage	Income aggregates are population-weighted means of all municipalities. In the 2025 edition, municipalities without an individual INE income value (Campillo de Deleitosa in the VIJ and Higuera de Albalat in Monfragüe) carry a common value in the Atlas; they are kept in the aggregates. Higuera de Albalat appears in the Atlas as Higuera.
La Siberia (excluded)	Biosphere Reserve, province of Badajoz, designated 2019, 11 municipalities. Computed on the same sources for 2011–2025: population change −16.27 %, change in registered unemployment −46.59 %, change in net disposable income per capita +3.42 %. These values are close to those of the three designated territories of Cáceres in Table 3.

Table S8. Registered unemployment and new contracts by sector

VIJ Geopark (Mancomunidad Integral Villuercas-Ibores-Jara, nineteen municipalities), December 2011 vs. December 2025. Registered unemployment at 31 December and annual cumulative new contracts by broad sector, with the totals of the source's sector tables, which are the denominators of the sectoral shares in §4.2 of the main text. The sector tables total 1,413 and 620 unemployed, against 1,420 and 625 in Tables S3 and S4, and 4,691 and 4,738 contracts, against 4,699 and 4,744 contracts in total for the year. Source: SEXPE Employment Observatory, labour market reports for the Mancomunidad Integral Villuercas-Ibores-Jara (the nineteen Geopark municipalities), December 2011 and December 2025; supplied by the SEXPE and published in aggregated form with its authorisation. Author's own elaboration.

Sector	2011 (no.)	2011 (%)	2025 (no.)	2025 (%)
Registered unemployment (31 December)				
Services	739	52.3	473	76.3
Construction	417	29.5	69	11.1
Agriculture and fishing	70	5.0	31	5.0
Industry	69	4.9	28	4.5
No previous employment	118	8.4	19	3.1
Total (sector table)	**1,413**	**100.0**	**620**	**100.0**
New contracts (annual cumulative)				
Agriculture and fishing	1,450	30.9	2,059	43.5
Industry	356	7.6	186	3.9
Construction	1,449	30.9	521	11.0
Services	1,436	30.6	1,972	41.6
Total (sector table)	**4,691**	**100.0**	**4,738**	**100.0**

Figure S1. Key indicators by municipality (2011 vs. 2025)

Small multiples comparing 2011 and 2025 for the six diagnostic indicators cited in the main text: total population, mean age, disposable household income per capita, registered unemployment rate, total number of commercial activities and Social Welfare Index. The 19 municipalities of the VIJ Geopark are ordered by decreasing 2025 population. Blue bars = 2011; orange bars = 2025. Source: author's own elaboration from the VIJ 2011–2025 database (Table S1); Socioeconomic Atlas of Extremadura (IEEX), 2011 and 2025 editions, and INE (Padrón).

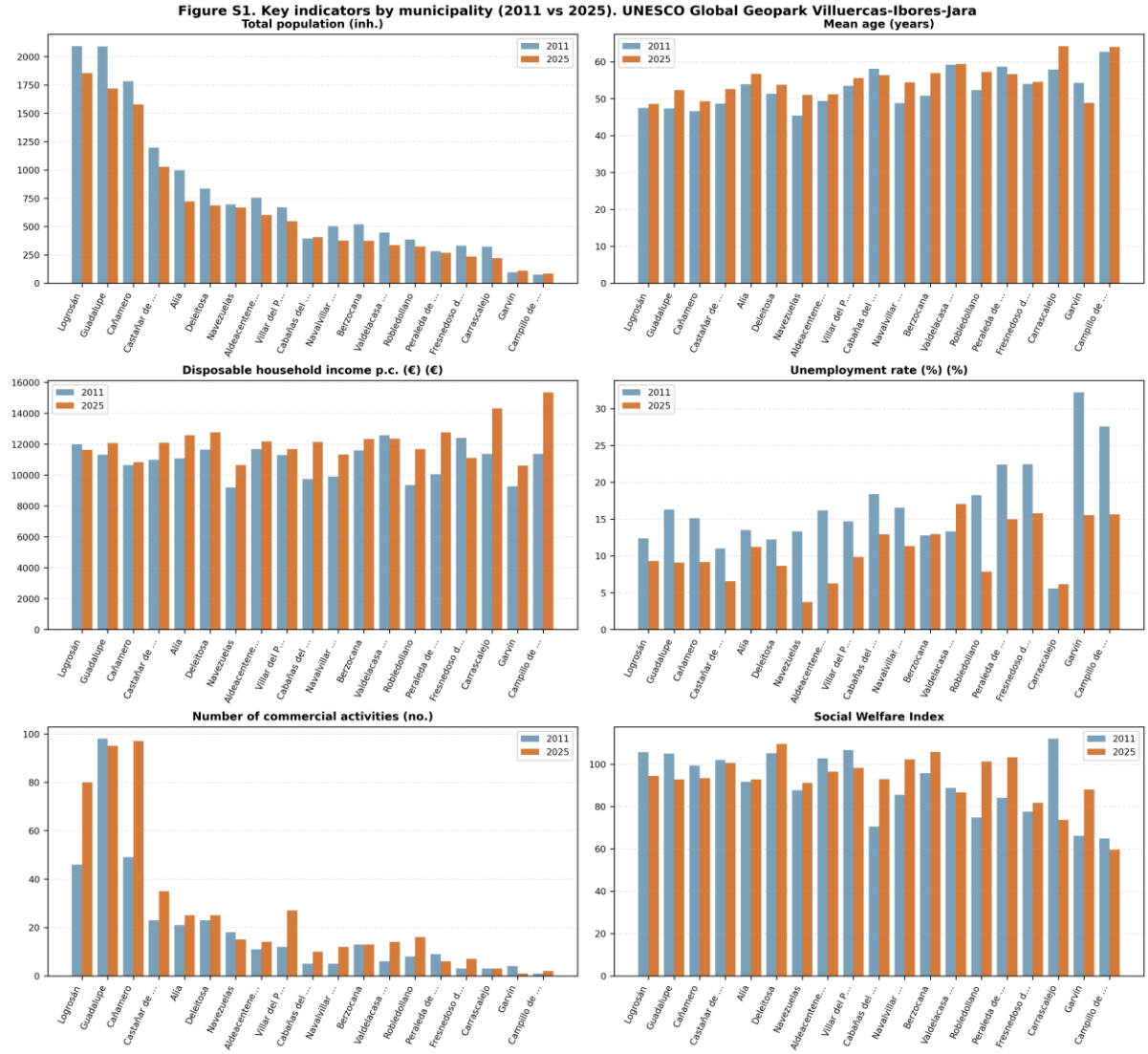


Figure S1. Socio-economic and demographic indicators by municipality, VIJ Geopark (2011–2025). Comparative small multiples. Source: author's own elaboration.

Figure S2. Dendrogram of the hierarchical-clustering robustness check

Agglomerative hierarchical clustering of the 19 municipalities of the VIJ Geopark, using Ward's minimum-variance criterion with squared Euclidean distance on four z-score standardised axes: (i) change in total population, (ii) change in the ageing index, (iii) change in nominal disposable household income per capita and (iv) change in the number of commercial activities, all for 2011–2025. The height of each linkage represents the loss of within-cluster homogeneity. The dashed line marks the cut-off at a linkage distance of 3.80, which yields three groups. The clustering is a robustness check: the categories reported in Table 2 of the main text are produced by the decision rules set out in §3.3, which the clustering corroborates in its principal divisions without reproducing exactly. Source: author's own elaboration with scipy.cluster.hierarchy (method = "ward").

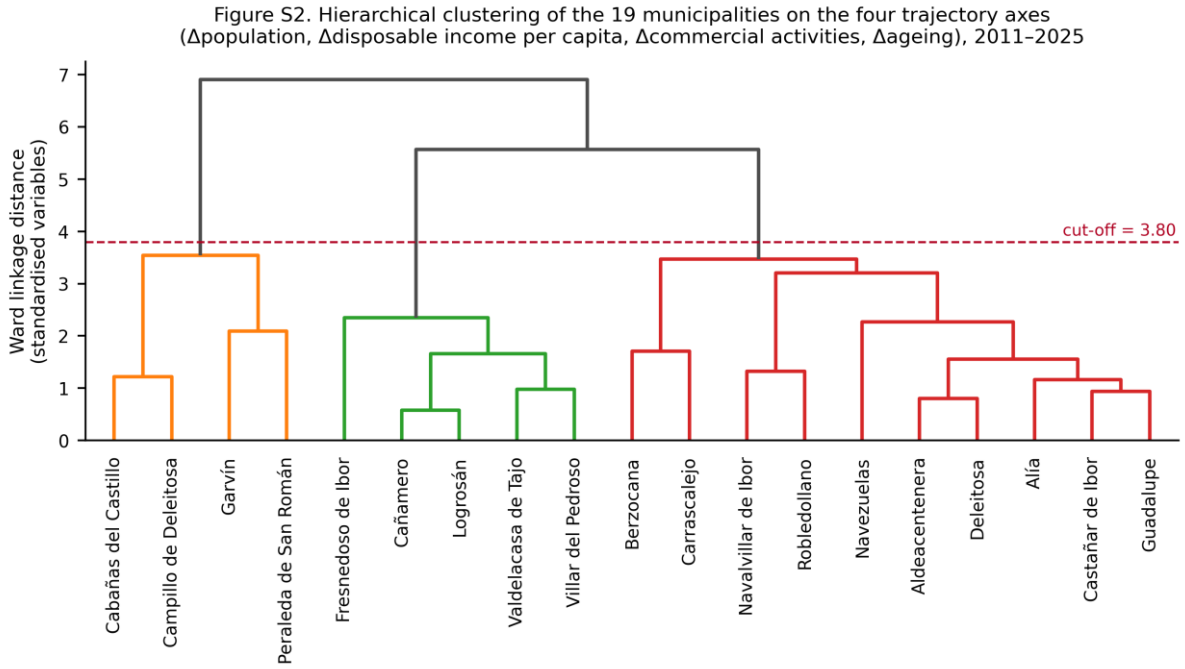


Figure S2. Dendrogram of the agglomerative hierarchical clustering used as a robustness check on the municipal typology. Ward's minimum-variance criterion with squared Euclidean distance over four standardised axes (ΔPopulation, ΔAgeing index, ΔIncome, ΔCommercial activities), nineteen municipalities of the VIJ Geopark, 2011–2025. The dashed line marks the cut-off at a linkage distance of 3.80, which yields three groups (§3.3 of the main text). The clustering is not the source of the categories reported in Table 2, which follow the decision rules set out in §3.3; it corroborates their principal divisions without reproducing them exactly, grouping Navezuelas with the moderately regressive block and Garvín with the micro-municipalities. Source: author's own elaboration.

Methodological note on the supplementary material

Temporal harmonisation of sources follows the procedure described in §3.2 of the main text (2011–2025 matching by municipality and treatment of indicators whose methodology changed between editions). The variables used in the typology and in the correlations have no missing values, so all coefficients are computed on the nineteen municipalities. Comarcal aggregates are simple sums for stock and flow variables; rates are recomputed from the summed numerators and denominators, and income per capita and normalised indices (Social Welfare, Socio-economic Level) are population-weighted means. The sectoral classification uses NACE-2009 in both editions (Table S2), so no remapping was required. Tables S2–S4 and S8 report comarcal aggregates only, taken from the SEXPE Employment Observatory's reports for the Mancomunidad. The breakdowns by sex, age and educational level (Tables S3 and S4) correspond to data that the Observatory also publishes openly by municipality for December 2025, whereas the series by sector and by NACE division (Tables S2 and S8) are not openly available and are published with the SEXPE's authorisation. All municipal figures in Tables S1 and S6 come from openly accessible sources.