

COUNTRY EXPOSURE MODEL

Review main statistic of a exposure model and create summaries for a given Country.

/home/risk/venvs/py38w/lib/python3.8/site-packages/geopandas/_compat.py:111: UserWarning: The Shapely GEOS version (3.9.1-CAPI-1.14.2) is incompatible with the GEOS version PyGEOS was compiled with (3.10.1-CAPI-1.16.0). Conversions between both will be slow.
warnings.warn(

```
# Parameters
country = "Spain"
```

Exposure files:
Exposure_Com_Spain.csv
Exposure_Ind_Spain.csv
Exposure_Res_Spain.csv

Sanity checks and formats

Exposure at National level

Summary by occupancy type

	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
OCCUPANCY					
Res	45.0M	9,305.7K	\$3,298.3B	92.94%	77.38%
Ind	18.0M	196.8K	\$487.6B	1.97%	11.44%
Com	18.0M	510.1K	\$476.5B	5.09%	11.18%

Other metrics to consider

	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
OCCUPANCY				
Total	2,030.0M	\$3,072.0B	203	\$2,100
Res	1,819.0M	\$2,638.7B	195	\$1,813
Ind	111.9M	\$195.1B	569	\$4,357
Com	99.0M	\$238.2B	194	\$4,811

Exposure summary at Admin level 1

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
NAME_1						
Cataluna	\$738.9B	1,302.5K	13,611.2K	17.34%	13.01%	16.82%
Andalucia	\$690.3B	2,118.7K	15,152.3K	16.19%	21.16%	18.72%
Comunidad Valenciana	\$505.2B	1,119.8K	9,068.2K	11.85%	11.18%	11.20%
Comunidad de Madrid	\$497.1B	660.5K	11,623.8K	11.66%	6.60%	14.36%
Galicia	\$310.0B	834.3K	5,019.1K	7.27%	8.33%	6.20%
Castilla y Leon	\$306.2B	931.7K	4,597.8K	7.18%	9.31%	5.68%
Castilla-La Mancha	\$259.3B	831.2K	3,812.5K	6.08%	8.30%	4.71%
Pais Vasco	\$193.3B	206.2K	3,955.6K	4.53%	2.06%	4.89%
Aragon	\$143.7B	326.4K	2,433.6K	3.37%	3.26%	3.01%
Region de Murcia	\$140.2B	412.0K	2,646.5K	3.29%	4.12%	3.27%
Principado de Asturias	\$112.2B	212.9K	1,946.1K	2.63%	2.13%	2.40%
Extremadura	\$110.3B	436.5K	1,999.2K	2.59%	4.36%	2.47%
Islas Baleares	\$93.0B	271.8K	1,992.0K	2.18%	2.71%	2.46%
Comunidad Foral de Navarra	\$63.0B	132.4K	1,158.7K	1.48%	1.32%	1.43%
Cantabria	\$54.7B	125.2K	1,072.5K	1.28%	1.25%	1.33%
La Rioja	\$38.0B	72.2K	581.3K	0.89%	0.72%	0.72%
Ceuta y Melilla	\$7.1B	18.3K	265.7K	0.17%	0.18%	0.33%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column						
	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MACRO_TAXO						
MUR	\$1,738.9B	6,282.7K	30.5M	40.80%	62.75%	37.74%
RC	\$1,720.9B	1,856.5K	31.7M	40.37%	18.54%	39.17%
MCF	\$544.2B	1,767.2K	9.0M	12.77%	17.65%	11.12%
S	\$258.4B	106.3K	9.7M	6.06%	1.06%	11.98%

Exposure by taxonomy

Showing only taxonomies that represent 90% of the total `COST_USD`

		COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
MACRO_TAXO	TAXONOMY				
MUR	MUR+CL/LWAL+CDN/H:2/RES	\$451.4B	1,702,145	11.78%	17.89%
	MUR+ST/LWAL+CDN/H:2/RES	\$341.2B	1,281,809	8.90%	13.48%
MCF	MCF/LWAL+CDL/H:2/RES	\$256.1B	864,722	6.68%	9.09%
MUR	MUR+CL/LWAL+CDN/H:1/RES	\$164.5B	1,234,221	4.29%	12.97%
S	S/LFM+CDL/H:1/IND	\$143.6B	59,047	3.75%	0.62%
RC	CR+PC/LFM+CDL/H:1/IND	\$110.5B	43,301	2.88%	0.46%
MUR	MUR+ST/LWAL+CDN/H:1/RES	\$109.6B	822,814	2.86%	8.65%
	MUR+CL/LWAL+CDN/H:6/RES	\$101.5B	42,288	2.65%	0.44%
MCF	MCF/LWAL+CDL/H:1/RES	\$83.4B	562,717	2.18%	5.92%
MUR	MUR+ST/LWAL+CDN/H:6/RES	\$75.6B	31,393	1.97%	0.33%
RC	CR/LFINF+CDL+LFC:0.0/HBET:10-15/RES	\$72.2B	9,797	1.88%	0.10%
MUR	MUR+CL/LWAL+CDN/H:3/RES	\$66.4B	327,966	1.73%	3.45%
	MUR+CL/LWAL+CDN/H:2/COM	\$57.5B	38,355	1.50%	0.40%
RC	CR/LFINF+CDH+LFC:2.0/H:2/RES	\$53.7B	185,190	1.40%	1.95%
MUR	MUR+CL/LWAL+CDN/H:1/COM	\$53.1B	114,089	1.39%	1.20%
	MUR+ST/LWAL+CDN/H:3/RES	\$48.9B	240,365	1.28%	2.53%
RC	MUR+CL/LWAL+CDN/H:5/RES	\$48.0B	80,230	1.25%	0.84%
	CR/LFINF+CDM+LFC:1.0/H:2/RES	\$42.9B	143,770	1.12%	1.51%
MUR	MUR+ST/LWAL+CDN/H:2/COM	\$42.8B	28,394	1.12%	0.30%
RC	CR/LFINF+CDH+LFC:5.0/H:2/RES	\$38.4B	128,096	1.00%	1.35%
MCF	MCF/LWAL+CDL/H:6/RES	\$36.4B	14,054	0.95%	0.15%
MUR	MUR+ST/LWAL+CDN/H:1/COM	\$36.2B	75,548	0.95%	0.79%
MCF	MCF/LWAL+CDL/H:3/RES	\$35.9B	155,593	0.94%	1.64%
MUR	MUR+ST/LWAL+CDN/H:5/RES	\$35.7B	59,528	0.93%	0.63%
	CR/LFINF+CDM+LFC:5.0/H:2/RES	\$35.3B	116,102	0.92%	1.22%
RC	CR/LFINF+CDL+LFC:0.0/H:8/RES	\$34.0B	6,684	0.89%	0.07%
	CR/LFLS+CDL+LFC:0.0/H:8/RES	\$34.0B	6,684	0.89%	0.07%
S	S+SL/LFM+CDL/H:1/IND	\$28.7B	11,809	0.75%	0.12%
MCF	MCF/LWAL+CDN/H:2/COM	\$27.8B	20,338	0.73%	0.21%
RC	CR/LFINF+CDL+LFC:4.0/HBET:10-15/RES	\$27.5B	3,850	0.72%	0.04%
	CR/LFINF+CDN/H:7/RES	\$27.2B	6,713	0.71%	0.07%
	CR/LFLS+CDN/H:7/RES	\$27.2B	6,713	0.71%	0.07%
MUR	MUR+CL/LWAL+CDN/H:4/RES	\$26.7B	106,338	0.70%	1.12%
	CR/LFINF+CDL+LFC:0.0/H:7/RES	\$26.1B	6,974	0.68%	0.07%
	CR/LFLS+CDL+LFC:0.0/H:7/RES	\$26.1B	6,974	0.68%	0.07%
	CR/LDUAL+CDL+LFC:4.0/HBET:10-15/RES	\$25.4B	3,516	0.66%	0.04%
RC	CR+PC/LFM+CDH/H:2/IND	\$25.1B	9,841	0.66%	0.10%
	CR+PC/LFM+CDM/H:2/IND	\$25.1B	9,841	0.66%	0.10%
	CR/LFM+CDL/H:2/IND	\$25.1B	9,841	0.66%	0.10%
	CR/LDUAL+CDL+LFC:2.0/HBET:10-15/RES	\$24.8B	3,387	0.65%	0.04%
MUR	CR/LFINF+CDL+LFC:2.0/HBET:10-15/RES	\$24.8B	3,387	0.65%	0.04%
	MCF/LWAL+CDN/H:1/COM	\$24.4B	46,335	0.64%	0.49%
	S/LFBR+CDH/H:1/IND	\$23.9B	9,841	0.62%	0.10%
	S/LFM+CDH/H:1/IND	\$23.9B	9,841	0.62%	0.10%
S	S/LFM+CDM/H:1/IND	\$23.9B	9,841	0.62%	0.10%
	CR/LFINF+CDN/H:8/RES	\$22.4B	4,120	0.59%	0.04%
	CR/LFLS+CDN/H:8/RES	\$22.4B	4,120	0.59%	0.04%
	CR/LFINF+CDL+LFC:2.0/H:8/RES	\$21.0B	4,224	0.55%	0.04%
RC	CR/LFLS+CDL+LFC:2.0/H:8/RES	\$21.0B	4,224	0.55%	0.04%
	MCF/LWAL+CDL/H:1/IND	\$20.1B	7,873	0.52%	0.08%
	CR/LFLS+CDN/H:2/RES	\$20.0B	64,445	0.52%	0.68%
	MUR+ST/LWAL+CDN/H:4/RES	\$19.8B	78,690	0.52%	0.83%
RC	CR/LFLS+CDL+LFC:0.0/H:2/RES	\$19.7B	64,197	0.51%	0.67%
	CR/LFINF+CDL+LFC:0.0/H:9/RES	\$18.8B	3,385	0.49%	0.04%
	CR/LFLS+CDL+LFC:0.0/H:9/RES	\$18.8B	3,385	0.49%	0.04%
MUR	MUR/LWAL+CDN/H:1/IND	\$18.2B	7,873	0.47%	0.08%
	CR/LFINF+CDN/HBET:10-15/RES	\$18.2B	2,410	0.47%	0.03%
	CR/LFINF+CDL+LFC:4.0/H:8/RES	\$17.4B	3,432	0.45%	0.04%
	CR/LFLS+CDL+LFC:4.0/H:8/RES	\$17.4B	3,432	0.45%	0.04%
RC	CR/LFINF+CDM+LFC:5.0/H:2/COM	\$16.4B	12,385	0.43%	0.13%
	CR/LFINF+CDM+LFC:1.0/H:2/COM	\$16.2B	12,287	0.42%	0.13%
	MCF/LWAL+CDL/H:5/RES	\$16.1B	24,914	0.42%	0.26%
	RC/LFINF+CDH+LFC:13.0/H:2/RES	\$15.0B	51,334	0.39%	0.54%
S	S+SL/LFM+CDH/H:1/IND	\$14.4B	5,905	0.37%	0.06%
	CR/LFINF+CDL+LFC:4.0/H:7/RES	\$13.9B	3,654	0.36%	0.04%
	CR/LFLS+CDL+LFC:4.0/H:7/RES	\$13.9B	3,654	0.36%	0.04%
	CR/LDUAL+CDL+LFC:0.0/HBET:10-15/RES	\$13.8B	1,911	0.36%	0.02%
RC	CR/LFINF+CDM+LFC:12.0/H:2/RES	\$13.3B	46,014	0.35%	0.48%
	CR/LFINF+CDH+LFC:2.0/H:6/RES	\$12.6B	4,896	0.33%	0.05%
	MUR+CL/LWAL+CDN/H:3/COM	\$12.5B	3,614	0.33%	0.04%
	CR/LFINF+CDH+LFC:2.0/H:3/RES	\$12.3B	54,049	0.32%	0.57%
RC	CR/LFINF+CDL+LFC:2.0/H:7/RES	\$11.9B	3,308	0.31%	0.03%
	CR/LFLS+CDL+LFC:2.0/H:7/RES	\$11.9B	3,308	0.31%	0.03%
	CR/LFINF+CDH+LFC:2.0/H:7/RES	\$11.8B	3,229	0.31%	0.03%
	MCF/LWAL+CDL/H:4/RES	\$11.5B	41,348	0.30%	0.43%
MUR	MUR+CL/LWAL+CDN/H:4/COM	\$11.4B	2,478	0.30%	0.03%
	CR/LFINF+CDL+LFC:4.0/H:9/RES	\$11.1B	1,978	0.29%	0.02%
	CR/LFLS+CDL+LFC:4.0/H:9/RES	\$11.1B	1,978	0.29%	0.02%
	CR/LFINF+CDM+LFC:1.0/H:3/RES	\$10.6B	45,693	0.28%	0.48%
RC	CR/LFINF+CDM+LFC:1.0/H:6/RES	\$10.2B	3,951	0.27%	0.04%
	CR/LFINF+CDM+LFC:1.0/H:7/RES	\$10.0B	2,785	0.26%	0.03%
	CR/LFLS+CDL+LFC:4.0/H:2/RES	\$10.0B	33,228	0.26%	0.35%
	MCF/LWAL+CDL/H:2/COM	\$9.8B	7,152	0.25%	0.08%
MUR	MUR+ST/LWAL+CDN/H:3/COM	\$9.3B	2,685	0.24%	0.03%
RC	CR/LFINF+CDH+LFC:5.0/H:3/RES	\$8.6B	36,971	0.23%	0.39%
MCF	MCF/LWAL+CDL/H:1/COM	\$8.6B	16,294	0.22%	0.17%
MUR	MUR+ST/LWAL+CDN/H:4/COM	\$8.6B	1,859	0.22%	0.02%
RC	CR/LFLS+CDL+LFC:2.0/H:2/RES	\$8.5B	28,836	0.22%	0.30%
	CR/LFINF+CDM+LFC:5.0/H:3/RES	\$8.4B	35,027	0.22%	0.37%
	CR/LFINF+CDH+LFC:2.0/H:8/RES	\$8.1B	1,633	0.21%	0.02%
	CR/LFINF+CDN/H:9/RES	\$7.9B	1,312	0.21%	0.01%
	CR/LFLS+CDN/H:9/RES	\$7.9B	1,312	0.21%	0.01%
	CR/LFLS+CDL+LFC:0.0/H:6/RES	\$7.9B	2,934	0.21%	0.03%
	CR/LDUAL+CDH+LFC:2.0/H:7/RES	\$7.8B	2,152	0.20%	0.02%
	CR/LFINF+CDL+LFC:2.0/H:9/RES	\$7.8B	1,458	0.20%	0.02%
	CR/LFLS+CDL+LFC:2.0/H:9/RES	\$7.8B	1,458	0.20%	0.02%
	CR/LFINF+CDM+LFC:1.0/H:8/RES	\$7.8B	1,525	0.20%	0.02%
	CR/LFINF+CDH+LFC:9.0/H:2/RES	\$7.6B	26,628	0.20%	0.28%
	CR/LFINF+CDL+LFC:8.0/HBET:10-15/RES	\$7.5B	1,141	0.20%	0.01%
MCF	CR/LFINF+CDH+LFC:5.0/H:6/RES	\$6.8B	2,600	0.18%	0.03%
	CR/LFLS+CDM+LFC:1.0/H:7/RES	\$6.7B	1,857	0.17%	0.02%
	CR/LFINF+CDM+LFC:5.0/H:3/COM	\$6.6B	6,875	0.17%	0.07%
	CR/LFINF+CDM+LFC:5.0/H:1/COM	\$6.6B	13,471	0.17%	0.14%
	CR/LFINF+CDM+LFC:1.0/H:3/COM	\$6.6B	6,821	0.17%	0.07%
	CR/LFINF+CDM+LFC:1.0/H:1/COM	\$6.6B	13,365	0.17%	0.14%
	CR/LFINF+CDH+LFC:2.0/H:5/RES	\$6.5B	10,163	0.17%	0.11%
	MCF/LWAL+CDN/H:3/COM	\$6.5B	2,931	0.17%	0.03%