

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 = "Portugal"
```

Exposure files:
Exposure_Com_Portugal.csv
Exposure_Ind_Portugal.csv
Exposure_Res_Portugal.csv

Sanity checks and formats

Exposure at National level

Summary by occupancy type

	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
OCCUPANCY					
Res	10,025.1K	3,353.8K	\$574.8B	92.41%	71.34%
Ind	2,054.4K	101.8K	\$92.5B	2.81%	11.48%
Com	4,009.8K	173.6K	\$138.4B	4.78%	17.18%

Other metrics to consider

	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
OCCUPANCY				
Total	510.7M	\$566.0B	141	\$1,578
Res	455.9M	\$459.8B	136	\$1,261
Ind	23.9M	\$37.0B	235	\$3,871
Com	30.9M	\$69.2B	178	\$4,480

Exposure summary at Admin level 1

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
NAME_1						
Lisboa	\$173.0B	417.1K	3,620.7K	21.48%	11.49%	22.50%
Porto	\$127.0B	485.4K	2,931.2K	15.77%	13.37%	18.22%
Setubal	\$78.5B	236.8K	1,448.1K	9.74%	6.52%	9.00%
Braga	\$57.3B	291.7K	1,333.3K	7.11%	8.04%	8.29%
Aveiro	\$56.2B	281.4K	1,182.8K	6.98%	7.76%	7.35%
Faro	\$47.9B	210.2K	757.0K	5.95%	5.79%	4.71%
Leiria	\$39.1B	228.9K	755.9K	4.86%	6.31%	4.70%
Santarem	\$38.9B	227.1K	724.1K	4.83%	6.26%	4.50%
Coimbra	\$36.3B	203.2K	687.3K	4.51%	5.60%	4.27%
Viseu	\$30.3B	215.2K	558.3K	3.76%	5.93%	3.47%
Viana do Castelo	\$20.7B	128.9K	362.6K	2.57%	3.55%	2.25%
Castelo Branco	\$18.7B	119.9K	314.7K	2.32%	3.30%	1.96%
Vila Real	\$17.8B	123.8K	300.2K	2.21%	3.41%	1.87%
Guarda	\$15.3B	118.1K	240.2K	1.90%	3.25%	1.49%
Evora	\$13.7B	85.9K	258.3K	1.70%	2.37%	1.61%
Beja	\$12.6B	96.9K	229.9K	1.56%	2.67%	1.43%
Braganca	\$12.3B	87.9K	201.9K	1.53%	2.42%	1.25%
Portalegre	\$10.0B	70.8K	182.8K	1.24%	1.95%	1.14%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MACRO_TAXO						
RC	\$542,111.6M	1,791.2K	10,779.6K	67.29%	49.36%	67.00%
MUR	\$200,091.3M	1,737.3K	3,721.2K	24.84%	47.87%	23.13%
S	\$59,870.8M	72.6K	1,529.0K	7.43%	2.00%	9.50%
OT	\$3,603.7M	28.1K	59.6K	0.45%	0.77%	0.37%

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/LWAL+CDN/H:2/FC/RES	\$55,801.5M	536,893	7.71%	15.45%
	MUR/LWAL+CDN/H:1/FC/RES	\$42,878.5M	447,206	5.93%	12.87%
	CR/LFM+CDM/H:1/IND	\$35,992.8M	38,692	4.97%	1.11%
RC	CR/LFINF+CDM+LFC:16.5/HBET:7-20/RES	\$28,009.5M	11,508	3.87%	0.33%
	MUR/LWAL+CDN/H:1/FW/RES	\$24,135.3M	249,586	3.34%	7.18%
S	S/LFBR+CDH/H:2/IND	\$22,552.7M	25,455	3.12%	0.73%
RC	CR/LFINF+CDM+LFC:4.5/H:2/RES	\$20,961.7M	181,492	2.90%	5.22%
S	S/LFM+CDM/H:1/IND	\$18,042.1M	20,364	2.49%	0.59%
MUR	MUR/LWAL+CDN/H:2/FW/RES	\$17,239.1M	168,321	2.38%	4.84%
	CR/LFINF+CDL+LFC:10.0/HBET:7-20/RES	\$15,048.4M	6,351	2.08%	0.18%
	CR/LFINF+CDM+LFC:16.5/H:2/RES	\$14,326.4M	106,541	1.98%	3.07%
RC	CR/LFINF+CDL+LFC:0.0/H:2/RES	\$14,313.3M	120,903	1.98%	3.48%
	MUR/LWAL+CDN/H:3/FC/RES	\$13,709.2M	88,494	1.89%	2.55%
	CR/LFINF+CDM+LFC:4.5/HBET:7-20/RES	\$12,856.9M	6,252	1.78%	0.18%
RC	CR/LFINF+CDM+LFC:16.5/H:4/RES	\$12,444.3M	14,937	1.72%	0.43%
	CR/LFINF+CDL+LFC:10.0/H:4/RES	\$11,478.8M	12,488	1.59%	0.36%
	CR+PC/LFM+CDL/H:2/IND	\$11,366.1M	12,218	1.57%	0.35%
MUR	MUR/LWAL+CDN/H:1/RES	\$11,098.0M	118,478	1.53%	3.41%
	CR/LFINF+CDM+LFC:4.5/H:3/RES	\$10,917.0M	56,904	1.51%	1.64%
	CR/LWAL+CDH+LFC:6.0/HBET:6-/COM	\$10,451.0M	5,910	1.44%	0.17%
RC	CR/LFINF+CDM+LFC:16.5/H:5/RES	\$10,415.9M	9,085	1.44%	0.26%
	CR/LFINF+CDM+LFC:4.5/H:4/RES	\$9,481.1M	14,889	1.31%	0.43%
	CR/LFINF+CDM+LFC:16.5/H:3/RES	\$9,177.3M	32,230	1.27%	0.93%
	CR/LFINF+CDM+LFC:9.0/H:2/RES	\$9,016.2M	83,793	1.25%	2.41%
	CR/LFINF+CDN/H:1/RES	\$8,291.0M	74,588	1.15%	2.15%
MUR	MUR/LWAL+CDN/H:4/FC/RES	\$8,237.3M	15,624	1.14%	0.45%
	CR/LFINF+CDM+LFC:16.5/H:1/RES	\$8,184.9M	72,196	1.13%	2.08%
	CR/LFINF+CDM+LFC:4.5/H:5/RES	\$8,170.5M	7,830	1.13%	0.23%
	CR/LFINF+CDM+LFC:16.5/H:6/RES	\$8,061.6M	5,841	1.11%	0.17%
	CR/LFINF+CDL+LFC:10.0/H:5/RES	\$7,977.1M	6,813	1.10%	0.20%
	CR/LFINF+CDN/H:2/RES	\$7,555.9M	57,642	1.04%	1.66%
	CR/LFINF+CDM/H:2/RES	\$7,158.4M	63,158	0.99%	1.82%
	CR/LFINF+CDL+LFC:10.0/H:2/RES	\$7,134.3M	42,555	0.99%	1.22%
RC	CR/LFINF+CDL+LFC:10.0/H:1/RES	\$6,845.5M	56,626	0.95%	1.63%
	CR/LFINF+CDM+LFC:4.5/H:1/RES	\$6,793.0M	63,544	0.94%	1.83%
	CR/LWAL+CDH+LFC:6.0/HBET:3-5/COM	\$6,725.9M	5,419	0.93%	0.16%
	CR/LFINF+CDL+LFC:5.0/H:1/RES	\$6,536.1M	63,918	0.90%	1.84%
	CR/LFINF+CDL+LFC:0.0/H:1/RES	\$6,513.3M	59,508	0.90%	1.71%
	CR/LWAL+CDM+LFC:16.5/HBET:6-/COM	\$5,504.5M	3,113	0.76%	0.09%
	CR/LFINF+CDM+LFC:4.5/H:6/RES	\$5,474.9M	4,072	0.76%	0.12%
	CR/LFINF+CDM/HBET:7-20/RES	\$5,458.3M	2,703	0.75%	0.08%
MUR	MUR/LWAL+CDN/H:2/RES	\$5,420.0M	55,432	0.75%	1.59%
	CR/LFINF+CDL+LFC:5.0/H:2/RES	\$5,399.8M	45,455	0.75%	1.31%
	CR/LWAL+CDM+LFC:4.5/HBET:6-/COM	\$5,281.8M	2,987	0.73%	0.09%
RC	CR/LFINF+CDL+LFC:10.0/H:3/RES	\$5,213.8M	12,699	0.72%	0.37%
	CR/LWAL+CDH+LFC:15.0/HBET:6-/COM	\$4,944.3M	2,796	0.68%	0.08%
	CR/LFINF+CDM+LFC:12.0/H:2/RES	\$4,915.9M	42,769	0.68%	1.23%
MUR	MUR/LWAL+CDN/H:5/FC/RES	\$4,801.8M	5,873	0.66%	0.17%
RC	CR/LFINF+CDM+LFC:9.0/H:3/RES	\$4,628.2M	28,976	0.64%	0.83%
S	S+SL/LFM+CDL/H:1/IND	\$4,510.5M	5,091	0.62%	0.15%
	CR/LFINF+CDM/H:3/RES	\$4,325.2M	23,835	0.60%	0.69%
	CR/LFINF+CDL+LFC:10.0/H:6/RES	\$4,097.7M	2,911	0.57%	0.08%
RC	CR/LFINF+CDL+LFC:0.0/H:3/RES	\$4,081.8M	22,067	0.56%	0.63%
	CR/LFINF+CDN/H:4/RES	\$3,944.6M	5,635	0.55%	0.16%
	SRC/LFM+CDH/H:2/COM	\$3,832.0M	4,901	0.53%	0.14%
S	SRC/LFM+CDM/H:2/COM	\$3,832.0M	4,901	0.53%	0.14%
	CR/LFINF+CDH+LFC:6.0/H:2/COM	\$3,752.4M	5,220	0.52%	0.15%
MUR	MUR/LWAL+CDN/H:3/FW/RES	\$3,743.4M	21,803	0.52%	0.63%
	CR/LFINF+CDM+LFC:12.0/H:1/RES	\$3,721.0M	36,529	0.51%	1.05%
	CR/LFINF+CDM+LFC:9.0/H:1/RES	\$3,704.9M	36,775	0.51%	1.06%
	CR/LFINF+CDM/H:4/RES	\$3,660.6M	6,039	0.51%	0.17%
	CR/LWAL+CDM+LFC:16.5/HBET:3-5/COM	\$3,536.2M	2,849	0.49%	0.08%
	CR/LFINF+CDH+LFC:6.0/HBET:3-5/COM	\$3,528.6M	3,105	0.49%	0.09%
	CR/LWAL+CDN/HBET:6-/COM	\$3,508.6M	1,984	0.48%	0.06%
	CR/LFINF+CDL+LFC:0.0/H:4/RES	\$3,459.3M	5,988	0.48%	0.17%
RC	CR/LFINF+CDH+LFC:6.0/H:1/COM	\$3,414.9M	8,682	0.47%	0.25%
	CR/LFINF+CDN/H:3/RES	\$3,397.4M	11,399	0.47%	0.33%
	CR/LWAL+CDM+LFC:4.5/HBET:3-5/COM	\$3,393.2M	2,734	0.47%	0.08%
	CR/LWAL+CDH+LFC:6.0/H:1/COM	\$3,279.6M	8,105	0.45%	0.23%
	CR/LWAL+CDH+LFC:15.0/HBET:3-5/COM	\$3,182.0M	2,564	0.44%	0.07%
	CR/LFINF+CDM+LFC:9.0/H:4/RES	\$3,160.5M	5,896	0.44%	0.17%
	CR/LFINF+CDM+LFC:9.0/HBET:7-20/RES	\$3,148.1M	1,876	0.44%	0.05%
	CR/LWAL+CDH+LFC:6.0/H:2/COM	\$2,893.6M	3,619	0.40%	0.10%
	CR/LFINF+CDM/H:1/RES	\$2,892.0M	27,863	0.40%	0.80%
MUR	MUR/LWAL+CDN/H:6/FC/RES	\$2,877.7M	2,862	0.40%	0.08%
RC	CR/LFINF+CDM/H:5/RES	\$2,842.0M	2,755	0.39%	0.08%
MUR	MUR/LWAL+CDN/H:2/COM	\$2,795.7M	6,742	0.39%	0.19%
	MUR/LWAL+CDN/H:4/FW/RES	\$2,657.4M	6,883	0.37%	0.20%
	CR/LFINF+CDL+LFC:0.0/HBET:7-20/RES	\$2,368.9M	1,245	0.33%	0.04%
	CR/LFINF+CDM+LFC:9.0/H:5/RES	\$2,263.4M	2,774	0.31%	0.08%
	CR/LWAL+CDN/HBET:3-5/COM	\$2,209.4M	1,779	0.31%	0.05%
	CR/LWAL+CDM+LFC:9.0/HBET:6-/COM	\$2,164.1M	1,224	0.30%	0.04%
RC	CR/LFINF+CDM+LFC:12.0/H:3/RES	\$2,148.7M	9,559	0.30%	0.28%
	CR/LFINF+CDM/H:6/RES	\$2,125.6M	1,687	0.29%	0.05%
	CR/LWAL+CDH+LFC:11.0/HBET:6-/COM	\$2,110.4M	1,193	0.29%	0.03%
	CR/LFINF+CDN/H:5/RES	\$2,092.4M	2,268	0.29%	0.07%
	CR/LFINF+CDN/HBET:7-20/RES	\$2,054.9M	1,350	0.28%	0.04%