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 Sh
apely 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(
```

```python
# Parameters
country = "Bulgaria"
```

```
Exposure files:
   Exposure_Com_Bulgaria.csv
   Exposure_Ind_Bulgaria.csv
   Exposure_Res_Bulgaria.csv
```

Sanity checks and formats

Exposure at National level

Summary by occupancy type

OCCUPANCY	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
Res	6,976.0K	2,060.7K	$169.3B	93.96%	51.09%
Ind	2,697.2K	51.8K	$108.6B	2.36%	32.77%
Com	2,790.4K	80.7K	$53.5B	3.68%	16.14%

Other metrics to consider

OCCUPANCY	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
Total	287.8M	$205.6B	131	$1,151
Res	227.0M	$135.4B	110	$746
Ind	42.5M	$43.4B	821	$2,552
Com	18.3M	$26.7B	227	$2,923

Exposure summary at Admin level 1

NAME_1	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
Grad Sofiya	$43,284.1M	128.1K	2,202.2K	13.06%	5.84%	17.67%
Plovdiv	$26,607.9M	162.1K	1,157.3K	8.03%	7.39%	9.29%
Sofia	$23,969.7M	153.5K	419.2K	7.24%	7.00%	3.36%
Varna	$20,120.7M	106.1K	810.0K	6.07%	4.84%	6.50%
Burgas	$18,434.5M	108.6K	705.5K	5.56%	4.95%	5.66%
Veliko Tarnovo	$15,395.9M	94.8K	440.7K	4.65%	4.32%	3.54%
Pazardzhik	$13,607.1M	91.3K	466.4K	4.11%	4.16%	3.74%
Stara Zagora	$13,382.6M	94.7K	567.1K	4.04%	4.32%	4.55%
Pleven	$13,023.6M	105.0K	459.9K	3.93%	4.79%	3.69%
Ruse	$12,366.5M	69.6K	401.1K	3.73%	3.18%	3.22%
Dobrich	$10,404.1M	63.6K	323.4K	3.14%	2.90%	2.59%
Vratsa	$10,378.8M	88.3K	318.6K	3.13%	4.02%	2.56%
Blagoevgrad	$10,079.8M	82.8K	530.5K	3.04%	3.78%	4.26%
Haskovo	$9,423.2M	75.2K	412.3K	2.84%	3.43%	3.31%
Montana	$9,241.5M	84.7K	249.4K	2.79%	3.86%	2.00%
Sliven	$8,605.9M	61.5K	336.7K	2.60%	2.80%	2.70%
Lovech	$8,063.2M	77.0K	241.1K	2.43%	3.51%	1.93%
Shumen	$7,819.6M	56.1K	298.8K	2.36%	2.56%	2.40%
Pernik	$7,789.3M	64.2K	223.4K	2.35%	2.93%	1.79%
Kyustendil	$7,038.8M	60.3K	229.6K	2.12%	2.75%	1.84%
Silistra	$6,467.8M	41.8K	203.7K	1.95%	1.91%	1.63%
Yambol	$6,054.3M	45.1K	224.1K	1.83%	2.06%	1.80%
Gabrovo	$5,931.4M	45.7K	209.2K	1.79%	2.08%	1.68%
Razgrad	$5,760.2M	44.8K	213.5K	1.74%	2.04%	1.71%
Vidin	$4,997.4M	55.8K	171.6K	1.51%	2.54%	1.38%
Targovishte	$4,896.2M	45.1K	203.6K	1.48%	2.06%	1.63%
Kardzhali	$4,238.4M	50.4K	242.7K	1.28%	2.30%	1.95%
Smolyan	$3,915.6M	37.3K	201.9K	1.18%	1.70%	1.62%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

MACRO_TAXO	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
RC	$161,034.6M	411.1K	5,775.4K	48.61%	18.75%	46.34%
MCF	$64,646.2M	555.5K	2,655.9K	19.51%	25.33%	21.31%
MUR	$55,107.9M	943.0K	2,557.5K	16.63%	42.99%	20.52%
S	$40,329.1M	19.7K	1,024.9K	12.17%	0.90%	8.22%
ADO/E	$8,608.9M	230.6K	380.4K	2.60%	10.52%	3.05%
W	$1,245.7M	25.1K	58.4K	0.38%	1.14%	0.47%
MIX	$325.7M	8.2K	11.1K	0.10%	0.37%	0.09%

Exposure by taxonomy

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

MACRO_TAXO	TAXONOMY	COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
RC	CR+PC/LWAL+CDL/H:2/IND	$27,860.5M	12,952	9.36%	0.65%
S	S/LFM+CDL/H:1/IND	$21,225.9M	10,361	7.13%	0.52%
MCF	MCF/LWAL+CDN/HBET:3-5/RES	$20,296.3M	79,146	6.82%	3.98%
MUR	MUR+CL/LWAL+CDN/H:1/FW/RES	$20,192.9M	520,557	6.78%	26.15%
MCF	MCF/LWAL+CDL/HBET:3-5/RES	$19,270.0M	71,469	6.47%	3.59%
RC	CR/LFINF+CDL/H:1/IND	$12,399.2M	48,938	4.17%	2.46%
	CR/LFINF+CDL/H:1/IND	$11,144.2M	5,181	3.74%	0.26%
S	S/LFM+CDM/H:1/IND	$10,612.9M	5,181	3.57%	0.26%
MCF	MCF/LWAL+CDN/H:2/RES	$10,140.2M	256,867	3.41%	12.90%
ADO/E	MUR+ADO/LWAL+CDN/H:1/RES	$8,608.9M	230,628	2.89%	11.59%
S	S+SL/LFM+CDL/H:1/IND	$8,490.3M	4,145	2.85%	0.21%
MUR	MUR+CL/LWAL+CDN/H:1/FC/IND	$8,065.3M	4,145	2.71%	0.21%
	CR/LFM+CDL/H:1/IND	$7,800.9M	3,626	2.62%	0.18%
RC	CR/LFINF+CDM+LFC:19.0/HBET:3-5/RES	$7,175.5M	25,804	2.41%	1.30%
	CR/LFINF+CDM+LFC:7.0/HBET:3-5/RES	$6,739.7M	25,771	2.26%	1.29%
MUR	MUR+CL/LWAL+CDN/H:2/COM	$5,710.2M	13,330	1.92%	0.67%
MCF	MCF/LWAL+CDL/H:2/RES	$5,647.3M	134,237	1.90%	6.74%
MUR	MUR+CL/LWAL+CDN/H:1/COM	$5,640.9M	24,264	1.89%	1.22%
RC	CR+PC/LWAL+CDL/H:2/IND	$5,572.1M	2,590	1.87%	0.13%
	CR/LFM+CDL/HBET:3-5/IND	$5,572.1M	2,590	1.87%	0.13%
	CR/LFINF+CDM+LFC:11.0/HBET:3-5/RES	$5,334.9M	21,208	1.79%	1.07%
	CR/LFINF+CDM+LFC:11.0/HBET:3-5/COM	$4,915.1M	2,399	1.65%	0.12%
MUR	MUR+CL/LWAL+CDN/H:2/FW/RES	$4,768.5M	124,389	1.60%	6.25%
	MUR+CL/LWAL+CDN/H:1/FC/RES	$4,308.8M	105,096	1.45%	5.28%
RC	CR/LFINF+CDL+LFC:2.5/HBET:3-5/RES	$3,978.0M	15,747	1.34%	0.79%
MUR	MUR+CL/LWAL+CDN/H:2/FC/RES	$2,808.2M	70,630	0.94%	3.55%
RC	CR/LFINF+CDL+LFC:5.0/HBET:3-5/RES	$2,786.4M	9,549	0.94%	0.48%
	CR/LWAL+CDM+LFC:19.0/HBET:3-5/COM	$2,785.0M	1,357	0.94%	0.07%
MCF	MCF/LWAL+CDN/HBET:3-5/COM	$2,715.3M	1,325	0.91%	0.07%
RC	CR+PC/LWAL+CDL+LFC:0.0/HBET:6-/RES	$2,562.2M	4,784	0.86%	0.24%
	CR/LFINF+CDM+LFC:7.0/HBET:3-5/COM	$2,547.6M	1,250	0.86%	0.06%
	CR/LFINF+CDL+LFC:0.0/H:2/RES	$2,287.4M	62,170	0.77%	3.12%
MCF	MCF/LWAL+CDL/HBET:3-5/COM	$2,286.0M	1,108	0.77%	0.06%
RC	CR/LFINF+CDL+LFC:4.5/HBET:3-5/RES	$2,284.9M	9,097	0.77%	0.46%
	CR/LFINF+CDL+LFC/HBET:3-5/COM	$2,242.2M	1,106	0.75%	0.06%
	CR+PC/LWAL+CDL/HBET:3-5/IND	$2,228.8M	1,036	0.75%	0.05%
	CR/LWAL+CDL+LFC:0.0/HBET:3-5/COM	$2,190.1M	1,102	0.74%	0.06%
	CR/LDUAL+CDL+LFC:0.0/HBET:3-5/RES	$2,080.8M	9,255	0.70%	0.46%
	CR/LFINF+CDL+LFC:9.0/HBET:3-5/COM	$1,811.0M	886	0.61%	0.04%
MUR	MUR+ST/LWAL+CDN/H:1/RES	$1,691.5M	46,178	0.57%	2.32%
RC	CR/LFINF+CDM+LFC:11.0/HBET:3-5/COM	$1,640.9M	804	0.55%	0.04%
	CR/LWAL+CDL+LFC:9.0/HBET:3-5/COM	$1,603.3M	798	0.54%	0.04%
MCF	MCF/LWAL+CDN/H:2/COM	$1,440.2M	2,650	0.48%	0.13%
RC	CR/LFINF+CDL+LFC:7.0/HBET:3-5/COM	$1,433.0M	702	0.48%	0.04%
MCF	MCF/LWAL+CDN/H:1/COM	$1,271.0M	4,619	0.43%	0.23%
RC	CR+PC/LWAL+CDL+LFC:0.0/HBET:3-5/RES	$1,232.3M	5,388	0.41%	0.27%
	CR+PC/LWAL+CDL+LFC:0.0/HBET:3-5/COM	$1,137.2M	589	0.38%	0.03%
	CR/LFINF+CDL+LFC:9.0/HBET:3-5/RES	$1,137.2M	3,675	0.38%	0.18%