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 = "Switzerland"
```

```
Exposure files:
  Exposure_Com_Switzerland.csv
  Exposure_Ind_Switzerland.csv
  Exposure_Res_Switzerland.csv
```

Sanity checks and formats

Exposure at National level

Summary by occupancy type

OCCUPANCY	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
Res	8,575.0K	1,730.8K	$1,110.0B	92.36%	75.22%
Ind	2,459.3K	25.0K	$132.7B	1.33%	9.00%
Com	3,430.0K	118.1K	$232.9B	6.30%	15.78%

Other metrics to consider

OCCUPANCY	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
Total	397.3M	$1,057.5B	212	$3,714
Res	350.1M	$888.0B	202	$3,170
Ind	19.3M	$53.1B	770	$6,892
Com	27.9M	$116.5B	236	$8,349

Exposure summary at Admin level 1

NAME_1	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
Zurich	$210.3B	235.7K	2,638.2K	14.25%	12.58%	18.24%
Bern	$171.9B	237.8K	1,760.9K	11.65%	12.69%	12.17%
Aargau	$103.4B	154.8K	1,091.3K	7.01%	8.26%	7.54%
Vaud	$97.1B	135.4K	1,328.3K	6.58%	7.23%	9.18%
St. Gallen	$87.9B	116.4K	901.7K	5.95%	6.21%	6.23%
Ticino	$83.9B	118.7K	602.2K	5.69%	6.34%	4.16%
Geneve	$80.0B	65.4K	873.4K	5.42%	3.49%	6.04%
Valais	$76.9B	116.9K	556.5K	5.21%	6.24%	3.85%
Luzern	$52.2B	70.4K	694.6K	3.54%	3.76%	4.80%
Fribourg	$50.5B	74.6K	530.3K	3.42%	3.98%	3.67%
Thurgau	$49.1B	68.9K	468.9K	3.32%	3.68%	3.24%
Basel-Landschaft	$48.4B	69.2K	478.7K	3.28%	3.69%	3.31%
Solothurn	$47.8B	70.7K	444.2K	3.24%	3.78%	3.07%
Neuchatel	$47.1B	41.5K	303.2K	3.19%	2.22%	2.10%
Graubunden	$45.6B	71.4K	329.5K	3.09%	3.81%	2.28%
Basel-Stadt	$34.4B	29.4K	345.0K	2.33%	1.57%	2.38%
Obwalden	$33.3B	23.2K	59.1K	2.26%	1.24%	0.41%
Schwyz	$29.2B	35.2K	275.0K	1.98%	1.88%	1.90%
Glarus	$22.1B	21.1K	73.6K	1.50%	1.13%	0.51%
Jura	$19.6B	26.3K	119.5K	1.33%	1.40%	0.83%
Zug	$16.4B	17.2K	205.1K	1.11%	0.92%	1.42%
Appenzell Innerrhoden	$16.0B	12.0K	26.0K	1.09%	0.64%	0.18%
Schaffhausen	$15.0B	19.9K	141.3K	1.02%	1.06%	0.98%
Uri	$13.4B	13.3K	59.7K	0.91%	0.71%	0.41%
Nidwalden	$12.4B	11.6K	70.3K	0.84%	0.62%	0.49%
Appenzell Ausserrhoden	$11.6B	16.8K	87.7K	0.78%	0.90%	0.61%

Exposure by simplified taxonomy

```
Adding `MACRO_TAXO` column
```

MACRO_TAXO	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
RC	$932.8B	649.2K	9,137.8K	63.22%	34.64%	63.18%
MUR	$266.7B	735.9K	2,366.7K	18.07%	39.27%	16.36%
W	$143.0B	331.3K	1,280.7K	9.69%	17.68%	8.85%
MIX	$72.6B	145.8K	552.2K	4.92%	7.78%	3.82%
S	$60.5B	11.8K	1,126.8K	4.10%	0.63%	7.79%

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/LFINF+CDN/HBET:6-/RES	$239,591.3M	45,333	18.05%	2.67%
MUR	MUR/LWAL+CDN/H:2/RES	$120,253.1M	435,131	9.06%	25.65%
MUR	MUR/LWAL+CDN/HBET:3-5/RES	$100,612.4M	216,591	7.58%	12.77%
RC	CR/LFINF+CDN/HBET:6-/SOS/RES	$81,699.1M	15,420	6.16%	0.91%
RC	CR/LFINF+CDL+LFC:2.0/HBET:6-/RES	$55,947.3M	10,651	4.22%	0.63%
RC	CR+PC/LWAL+CDN/HBET:3-5/RES	$42,785.0M	80,992	3.22%	4.77%
MIX	MIX(MUR+CR)/LWAL+CDL+LFC:2.0/HBET:3-5/RES	$38,029.6M	76,260	2.87%	4.50%
W	W/LWAL+CDN/HBET:3-5/RES	$37,168.1M	79,521	2.80%	4.69%
W	W/LWAL+CDL/HBET:3-5/RES	$33,010.4M	70,770	2.49%	4.17%
RC	CR/LWAL+CDH+LFC:5.0/HBET:6-/RES	$28,256.0M	5,333	2.13%	0.31%
RC	CR/LFINF+CDM+LFC:3.0/HBET:6-/RES	$26,539.8M	5,043	2.00%	0.30%
	CR/LFINF+CDH+LFC:5.0/HBET:3-5/COM	$26,340.9M	7,800	1.98%	0.46%
S	S/LFM+CDH/H:1/IND	$24,775.8M	4,750	1.87%	0.28%
RC	CR/LFINF+CDN/HBET:3-5/RES	$23,969.2M	47,337	1.81%	2.79%
	CR/LFINF+CDL/H:2/IND	$23,276.7M	4,250	1.75%	0.25%
W	W/LWAL+CDM/HBET:3-5/RES	$22,731.3M	48,723	1.71%	2.87%
RC	CR/LFINF+CDM+LFC:3.0/HBET:3-5/COM	$21,965.0M	6,423	1.65%	0.38%
MIX	MIX(MUR+CR)/LWAL+CDM+LFC:3.0/HBET:3-5/RES	$20,500.5M	41,074	1.54%	2.42%
S	S/LFM+CDM/H:1/IND	$18,255.9M	3,500	1.38%	0.21%
	CR+PC/LFM+CDL/H:2/IND	$16,430.6M	3,000	1.24%	0.18%
RC	CR/LWAL+CDN/HBET:3-5/SOS/RES	$16,341.9M	30,247	1.23%	1.78%
	CR/LFINF+CDL+LFC:2.0/HBET:3-5/RES	$15,900.9M	52,603	1.20%	3.10%
MUR	MUR/LWAL+CDN/H:1/RES	$14,655.2M	52,308	1.10%	3.08%
RC	CR/LFINF+CDH+LFC:5.0/HBET:3-5/RES	$14,622.6M	27,488	1.10%	1.62%
S	S+SL/LFM+CDH/H:1/IND	$14,343.9M	2,750	1.08%	0.16%
RC	CR/LFINF+CDH+LFC:8.0/HBET:3-5/COM	$13,948.6M	4,130	1.05%	0.24%
	CR/LWAL+CDL+LFC:2.0/HBET:3-5/RES	$12,430.8M	24,024	0.94%	1.42%
MUR	MUR/LWAL+CDN/H:2/RES	$11,675.9M	21,184	0.88%	1.25%
RC	CR+PC/LWAL+CDN/HBET:3-5/COM	$11,405.2M	3,315	0.86%	0.20%
MUR	MUR/LWAL+CDN/H:2/COM	$10,808.2M	8,908	0.81%	0.53%
RC	CR/LFINF+CDM+LFC:3.0/HBET:3-5/SOS/COM	$9,525.6M	2,601	0.72%	0.15%
	CR/LWAL+CDH+LFC:5.0/HBET:3-5/RES	$9,462.4M	18,111	0.71%	1.07%
W	W/LWAL+CDL/H:2/RES	$9,296.2M	33,918	0.70%	2.00%
RC	CR/LFINF+CDN/HBET:6-/COM	$9,242.2M	1,834	0.70%	0.11%
	CR/LFINF+CDM+LFC:3.0/HBET:3-5/RES	$9,222.1M	30,551	0.69%	1.80%
MUR	MUR/LWAL+CDN/H:1/IND	$8,671.3M	1,750	0.65%	0.10%
RC	CR/LFINF+CDN/HBET:3-5/COM	$8,601.5M	2,463	0.65%	0.15%
	CR/LFINF+CDL+LFC:2.0/HBET:6-/SOS/RES	$8,167.7M	1,547	0.62%	0.09%
	CR/LWAL+CDH+LFC:8.0/HBET:6-/RES	$7,381.5M	1,404	0.56%	0.08%
W	W/LWAL+CDH/H:2/RES	$7,344.0M	26,859	0.55%	1.58%
MIX	MIX(MUR+CR)/LWAL+CDH+LFC:5.0/HBET:3-5/RES	$6,877.5M	13,993	0.52%	0.82%
	CR/LFINF+CDM+LFC:3.0/H:2/COM	$6,851.7M	4,474	0.52%	0.26%
	CR/LFINF+CDM+LFC:6.0/HBET:3-5/COM	$6,775.6M	1,981	0.51%	0.12%
RC	CR/LFINF+CDL+LFC:2.0/HBET:3-5/RES	$6,668.4M	13,444	0.50%	0.79%
	CR/LFINF+CDN/HBET:3-5/SOS/RES	$6,611.5M	12,257	0.50%	0.72%
	CR+PC/LWAL+CDL+LFC:2.0/HBET:3-5/RES	$6,379.5M	12,380	0.48%	0.73%
	CR/LWAL+CDH+LFC:5.0/HBET:3-5/COM	$6,363.9M	1,787	0.48%	0.11%
W	W/LWAL+CDM+LFC:3.0/HBET:3-5/RES	$6,345.8M	23,164	0.48%	1.37%
RC	CR/LWAL+CDM+LFC:3.0/HBET:3-5/RES	$5,789.3M	11,116	0.44%	0.66%
W	W/LWAL+CDL/H:1/RES	$5,473.0M	18,793	0.41%	1.11%
	CR/LFINF+CDM+LFC:3.0/HBET:3-5/COM	$5,375.9M	17,901	0.41%	1.06%
RC	CR/LWAL+CDM+LFC:3.0/HBET:3-5/COM	$4,937.5M	1,410	0.37%	0.08%
W	W/LWAL+CDM/H:2/COM	$4,338.6M	3,654	0.33%	0.22%