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 = "Ukraine"
```

```
Exposure files:
  Exposure_Com_Ukraine.csv
  Exposure_Ind_Ukraine.csv
  Exposure_Res_Ukraine.csv
```

Sanity checks and formats

Exposure at National level

Summary by occupancy type

OCCUPANCY	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
Res	51.7M	12,188.8K	$629.1B	96.33%	61.88%
Ind	0.0M	190.0K	$186.4B	1.50%	18.34%
Com	0.0M	274.9K	$201.1B	2.17%	19.78%

Other metrics to consider

OCCUPANCY	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
Total	1,075.2M	$678.4B	85	$946
Res	913.2M	$503.3B	75	$689
Ind	70.2M	$74.6B	370	$2,655
Com	91.8M	$100.6B	334	$2,191

Exposure summary at Admin level 1

NAME_1	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
Cherkasy	$186,932.8M	518.0K	1,455.8K	18.39%	4.09%	2.81%
Donets'k	$75,896.0M	1,295.9K	5,453.3K	7.47%	10.24%	10.54%
Dnipropetrovs'k	$64,749.7M	881.9K	3,627.3K	6.37%	6.96%	7.01%
Kiev City	$64,191.9M	641.8K	2,566.6K	6.31%	5.07%	4.96%
Kharkiv	$53,332.5M	741.7K	3,052.1K	5.25%	5.86%	5.90%
L'viv	$45,770.2M	684.1K	2,836.7K	4.50%	5.41%	5.48%
Odessa	$44,307.7M	600.0K	2,465.8K	4.36%	4.74%	4.77%
Chernihiv	$43,329.8M	370.0K	1,448.8K	4.26%	2.92%	2.80%
Luhans'k	$39,240.9M	692.1K	2,918.4K	3.86%	5.47%	5.64%
Kiev	$35,015.1M	495.3K	2,045.7K	3.44%	3.91%	3.95%
Zaporizhzhya	$32,703.5M	481.9K	1,996.0K	3.22%	3.81%	3.86%
Vinnytsya	$28,347.3M	459.4K	1,912.0K	2.79%	3.63%	3.70%
Poltava	$28,329.2M	446.8K	1,860.3K	2.79%	3.53%	3.60%
Crimea	$25,826.2M	503.4K	2,136.3K	2.54%	3.98%	4.13%
Zhytomyr	$25,379.7M	389.0K	1,613.3K	2.50%	3.07%	3.12%
Khmel'nyts'kyy	$23,846.9M	383.7K	1,596.4K	2.35%	3.03%	3.09%
Ivano-Frankivs'k	$22,947.0M	353.8K	1,467.5K	2.26%	2.80%	2.84%
Sumy	$22,615.4M	349.7K	1,454.2K	2.22%	2.76%	2.81%
Mykolayiv	$21,195.5M	323.4K	1,343.2K	2.08%	2.56%	2.60%
Transcarpathia	$20,935.8M	308.4K	1,275.5K	2.06%	2.44%	2.47%
Rivne	$20,208.7M	299.4K	1,234.5K	1.99%	2.37%	2.39%
Kherson	$18,870.8M	281.9K	1,167.0K	1.86%	2.23%	2.26%
Ternopil'	$18,246.5M	294.7K	1,228.0K	1.79%	2.33%	2.37%
Kirovohrad	$17,625.2M	282.5K	1,178.7K	1.73%	2.23%	2.28%
Volyn	$17,129.1M	266.9K	1,107.2K	1.68%	2.11%	2.14%
Chernivtsi	$15,120.3M	223.4K	923.3K	1.49%	1.77%	1.78%
Sevastopol'	$4,570.8M	85.2K	361.4K	0.45%	0.67%	0.70%

Exposure by simplified taxonomy

```
Adding `MACRO_TAXO` column
```

MACRO_TAXO	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MUR	$492,494.7M	10,388.8K	26,508.2K	48.44%	82.10%	51.25%
RC	$391,645.6M	914.7K	18,743.9K	38.52%	7.23%	36.24%
ADO/E	$76,346.4M	1,252.4K	6,371.1K	7.51%	9.90%	12.32%
S	$54,567.3M	57.0K	0.0K	5.37%	0.45%	0.00%
W	$1,610.8M	40.8K	102.3K	0.16%	0.32%	0.20%

Exposure by taxonomy

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

MACRO_TAXO	TAXONOMY	COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
MUR	MUR+STRUB/LWAL+CDN/H:1/RES	$290.4B	8,934.6K	32.28%	72.89%
RC	CR/LFINF+CDN/HBET:3-5/RES	$219.0B	736.9K	24.34%	6.01%
ADO/E	MUR+ADO/LWAL+CDN/H:1/RES	$76.3B	1,252.4K	8.48%	10.22%
MUR	MUR+STRUB/LWAL+CDN/HBET:3-5/COM	$52.7B	35.8K	5.86%	0.29%
	MUR+STRUB/LWAL+CDN/H:1/COM	$50.8B	119.8K	5.65%	0.98%
RC	CR+PC/LFM+CDN/H:1/IND	$47.7B	47.5K	5.31%	0.39%
	CR/LFM+CDN/H:1/IND	$38.2B	38.0K	4.24%	0.31%
S	S+SL/LFM+CDN/H:1/IND	$36.4B	38.0K	4.04%	0.31%
MUR	MUR+CL/LWAL+CDN/H:1/RES	$29.9B	1,008.9K	3.32%	8.23%
RC	CR/LFINF+CDL/HBET:3-5/COM	$29.7B	16.4K	3.30%	0.13%
	CR/LFINF+CDN/H:1/IND	$28.6B	28.5K	3.18%	0.23%