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 S
hapely GEOS version (3.9.1-CAPI-1.14.2) is incompatible with the GEOS version PyGEOS was compil
ed with (3.10.1-CAPI-1.16.0). Conversions between both will be slow.
  warnings.warn(
```

```
# Parameters
country = "Mongolia"
```

```
Exposure files:
  Exposure_Com_Mongolia.csv
  Exposure_Ind_Mongolia.csv
  Exposure_Res_Mongolia.csv
```

Sanity checks and formats

Mongolia
```
Exposure/Exposure/Exposure_Com_Mongolia.csv
Exposure/Exposure/Exposure_Ind_Mongolia.csv
Exposure/Exposure/Exposure_Res_Mongolia.csv
Occupants / Dwellings = 4.1
Reference avg household size (2019) = 3.66
Population (exposure / UN_2021) = 0.98
Exposure models  OK
```

Exposure at National level

Summary by occupancy type

OCCUPANCY	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
Res	3,253.3K	454.2K	$15,751.5M	91.73%	80.86%
Ind	0.0K	10.2K	$1,115.9M	2.06%	5.73%
Com	0.0K	30.8K	$2,611.3M	6.21%	13.41%

Other metrics to consider

OCCUPANCY	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
Total	34,210.6K	$15,816.5M	69	$569
Res	28,928.0K	$13,305.3M	64	$545
Ind	1,568.6K	$681.4M	154	$711
Com	3,714.1K	$1,829.7M	121	$703

Exposure summary at Admin level 1

NAME_1	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
Ulaanbaatar	$13,697.3M	174,327	1,499.1K	70.32%	35.21%	46.08%
Orkhon	$555.4M	14,527	105.4K	2.85%	2.93%	3.24%
Darkhan-Uul	$509.3M	10,390	103.6K	2.61%	2.10%	3.18%
Selenge	$498.3M	19,258	108.4K	2.56%	3.89%	3.33%
Khovsgol	$490.4M	27,904	136.1K	2.52%	5.64%	4.18%
Bayan-Olgii	$429.9M	16,280	105.9K	2.21%	3.29%	3.25%
Dornod	$363.2M	13,821	83.5K	1.86%	2.79%	2.57%
Dornogovi	$286.5M	11,031	71.2K	1.47%	2.23%	2.19%
Ovorkhangai	$283.8M	23,027	116.8K	1.46%	4.65%	3.59%
To'v	$272.4M	19,474	93.3K	1.40%	3.93%	2.87%
Arxangai	$240.5M	20,028	95.1K	1.23%	4.04%	2.92%
Bulgan	$234.1M	14,153	61.5K	1.20%	2.86%	1.89%
Hentii	$216.7M	15,505	78.5K	1.11%	3.13%	2.41%
Khovd	$212.0M	15,956	89.0K	1.09%	3.22%	2.73%
Zavkhan	$200.4M	15,555	73.2K	1.03%	3.14%	2.25%
Bayankhongor	$182.8M	17,662	89.3K	0.94%	3.57%	2.75%
Omnogovi	$179.9M	14,816	71.2K	0.92%	2.99%	2.19%
Sukhbaatar	$175.9M	12,800	64.3K	0.90%	2.59%	1.98%
Uvs	$164.4M	15,281	84.3K	0.84%	3.09%	2.59%
Govi-Altai	$120.1M	11,211	58.3K	0.62%	2.26%	1.79%
Dundgovi	$100.3M	9,882	47.3K	0.52%	2.00%	1.45%
Govisumber	$65.3M	2,281	18.0K	0.34%	0.46%	0.55%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

MACRO_TAXO	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
RC	$8,653.4M	18,155	102.1K	44.42%	3.67%	3.14%
W	$5,412.9M	378,463	2,464.2K	27.79%	76.43%	75.74%
MUR	$4,587.8M	80,014	574.9K	23.55%	16.16%	17.67%
S	$678.3M	4,514	33.3K	3.48%	0.91%	1.02%
ADO/E	$116.0M	7,531	32.2K	0.60%	1.52%	0.99%
OT	$30.5M	6,493	46.7K	0.16%	1.31%	1.43%

Exposure by taxonomy

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

MACRO_TAXO	TAXONOMY	COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
W	W+WLI/LPB+DUH/HBET:1-2/RES	$2,814.4M	84,175	16.20%	18.67%
RC	CR+PC/LWAL+DUL/H:9/RES	$2,109.5M	791	12.14%	0.18%
RC	CR+PC/LWAL+DUL/H:5/RES	$1,260.9M	1,063	7.26%	0.24%
MUR	MUR+CLBRS/LWAL+DUL/HBET:2-4/RES	$1,103.5M	13,794	6.35%	3.06%
RC	CR+CIP/LWAL+DUM/HBET:6+/RES	$1,051.4M	1,164	6.05%	0.26%
W	W+WLI/LPB+DUH/H:1/RES	$965.6M	42,917	5.56%	9.52%
MUR	MUR+STRUB/LWAL+DNO/HBET:2-4/RES	$870.4M	10,880	5.01%	2.41%
MUR	MUR+CBS/LWAL+DNO/HBET:2-4/RES	$870.4M	10,880	5.01%	2.41%
RC	CR+CIP/LWAL+DUL/HBET:4-6/RES	$766.7M	1,358	4.41%	0.30%
W	W+WO/LPB+DUH/H:1/RES	$761.0M	231,968	4.38%	51.46%
RC	CR+CIP/LFINF+DUM/HBET:6+/RES	$519.2M	657	2.99%	0.15%
W	W+WLI/HBET:1-2/COM	$461.1M	14,168	2.65%	3.14%
RC	CR+CIP/LFINF/HBET:3-5/COM	$413.2M	1,607	2.38%	0.36%
RC	CR+CIP/LWAL/HBET:3-5/COM	$413.2M	1,607	2.38%	0.36%
RC	CR+CIP/LFINF/DUL/HBET:4-6/RES	$378.6M	766	2.18%	0.17%
MUR	MUR+CLBRS/LWAL+DUL/HBET:1-3/RES	$331.0M	7,757	1.91%	1.72%
RC	CR+CIP/LWAL/HBET:6+/COM	$330.6M	536	1.90%	0.12%
RC	CR+CIP/LFINF/HBET:6+/COM	$330.6M	536	1.90%	0.12%
W	W+WLI/HBET:1-2/IND	$318.9M	3,463	1.84%	0.77%
MUR	MUR+STRUB/LWAL+DNO/HBET:1-3/RES	$289.4M	6,783	1.67%	1.50%
RC	CR+CIP/LWAL+DUL/HBET:1-3/RES	$274.2M	2,088	1.58%	0.46%
MUR	MUR+CLBRS/HBET:1-3/COM	$264.2M	5,382	1.52%	1.19%
S	S/LFM+DUL/HBET:4-6/RES	$242.9M	972	1.40%	0.22%
MUR	MUR+CBS/LWAL+DNO/HBET:1-3/RES	$231.5M	5,427	1.33%	1.20%