

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 = "China"
```

Exposure files:
Exposure_Com_China.csv
Exposure_Ind_China.csv
Exposure_Res_China.csv

Sanity checks and formats

Exposure at National level

Summary by occupancy type

	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
OCCUPANCY					
Res	1,421.3M	180.7M	\$35,683.3B	82.87%	77.18%
Ind	0.0M	13.1M	\$4,204.2B	6.02%	9.09%
Com	0.0M	24.2M	\$6,346.6B	11.11%	13.73%

Other metrics to consider

	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
OCCUPANCY				
Total	62.8B	\$31,910.2B	288	\$736
Res	47.7B	\$26,034.4B	264	\$748
Ind	8.2B	\$2,031.1B	623	\$514
Com	6.9B	\$3,844.7B	286	\$917

Exposure summary at Admin level 1

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
NAME_1						
Guangdong	\$6,319.8B	17,930.7K	177,463.5K	13.67%	8.22%	12.49%
Jiangsu	\$5,245.1B	15,718.1K	96,969.8K	11.34%	7.21%	6.82%
Zhejiang	\$5,175.7B	10,972.7K	92,433.2K	11.19%	5.03%	6.50%
Shandong	\$2,666.0B	18,188.9K	96,535.9K	5.77%	8.34%	6.79%
Shanghai	\$2,477.4B	7,275.1K	67,326.8K	5.36%	3.34%	4.74%
Hubei	\$2,388.5B	6,527.2K	54,370.3K	5.17%	2.99%	3.83%
Sichuan	\$1,875.1B	10,432.1K	61,974.1K	4.06%	4.78%	4.36%
Chongqing	\$1,666.9B	3,212.4K	40,260.1K	3.61%	1.47%	2.83%
Hebei	\$1,573.1B	15,139.2K	68,054.3K	3.40%	6.94%	4.79%
Anhui	\$1,503.0B	9,505.2K	49,071.0K	3.25%	4.36%	3.45%
Fujian	\$1,350.4B	4,397.9K	37,272.1K	2.92%	2.02%	2.62%
Hunan	\$1,333.5B	6,073.6K	43,700.1K	2.88%	2.79%	3.07%
Beijing	\$1,286.1B	6,390.3K	41,850.4K	2.78%	2.93%	2.94%
Liaoning	\$1,220.8B	8,151.5K	53,418.7K	2.64%	3.74%	3.76%
Henan	\$1,172.1B	12,450.0K	67,312.8K	2.54%	5.71%	4.74%
Shaanxi	\$1,051.4B	5,807.6K	36,376.1K	2.27%	2.66%	2.56%
Yunnan	\$999.9B	5,288.9K	33,062.1K	2.16%	2.43%	2.33%
Shanxi	\$848.6B	6,244.4K	34,153.8K	1.84%	2.86%	2.40%
Guangxi	\$800.3B	4,745.2K	29,381.5K	1.73%	2.18%	2.07%
Tianjin	\$742.4B	3,184.2K	25,182.0K	1.61%	1.46%	1.77%
Jiangxi	\$701.7B	3,122.4K	24,539.7K	1.52%	1.43%	1.73%
Heilongjiang	\$609.5B	8,990.8K	36,835.5K	1.32%	4.12%	2.59%
Xinjiang Uygur	\$595.5B	3,785.1K	24,062.7K	1.29%	1.74%	1.69%
Gansu	\$560.0B	3,988.3K	23,138.9K	1.21%	1.83%	1.63%
Nei Mongol	\$522.6B	5,925.4K	25,147.1K	1.13%	2.72%	1.77%
Guizhou	\$476.6B	5,134.3K	26,500.1K	1.03%	2.35%	1.86%
Hainan	\$389.3B	2,706.2K	15,692.5K	0.84%	1.24%	1.10%
Jilin	\$366.9B	4,441.3K	24,591.7K	0.79%	2.04%	1.73%
Ningxia Hui	\$182.7B	1,226.5K	7,985.9K	0.40%	0.56%	0.56%
Qinghai	\$111.2B	820.5K	4,887.0K	0.24%	0.38%	0.34%
Xizang	\$22.0B	259.7K	1,746.9K	0.05%	0.12%	0.12%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MACRO_TAXO						
RC	\$30,015,729,923,689	107,528,392	890.7M	64.92%	49.32%	62.67%
MCF	\$7,279,082,380,220	27,437,280	243.6M	15.74%	12.58%	17.14%
MUR	\$4,186,027,997,440	42,976,757	133.0M	9.05%	19.71%	9.36%
W	\$3,317,856,469,599	28,946,874	101.1M	7.18%	13.28%	7.11%
OT	\$1,435,438,619,200	11,146,765	52.9M	3.10%	5.11%	3.72%
S	\$4	1	0.0M	0.00%	0.00%	0.00%

Exposure by taxonomy

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

		COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
MACRO_TAXO	TAXONOMY				
RC	CR/LFINF+DUL/H:4-6/RES	\$5,537.0B	3,346.9K	13.32%	1.66%
MCF	MCF/LWAL+DUL/H:4-6/RES	\$3,493.7B	3,175.8K	8.40%	1.58%
RC	CR/LFINF+DUL/H:1/RES	\$2,751.0B	50,463.5K	6.62%	25.03%
RC	CR/LFINF+DUL/H:2-3/RES	\$2,723.0B	8,082.6K	6.55%	4.01%
MUR	MUR/H:1/RES	\$1,824.8B	31,166.0K	4.39%	15.46%
	CR/LFM+DUL/H:2-3/RES	\$1,785.1B	5,917.3K	4.29%	2.94%
	CR/LFM+DUL/H:4-6/RES	\$1,700.4B	1,218.0K	4.09%	0.60%
RC	CR/LWAL+DUL/H:4-6/RES	\$1,700.4B	1,218.0K	4.09%	0.60%
	CR/LFINF+DUL/H:7-9/RES	\$1,587.5B	555.1K	3.82%	0.28%
W	W/H:1/RES	\$1,219.2B	19,500.7K	2.93%	9.67%
MUR	MUR/H:2-3/RES	\$1,203.0B	4,406.6K	2.89%	2.19%
W	W/H:2-3/RES	\$1,203.0B	4,406.6K	2.89%	2.19%
	CR/LFM+DUL/H:7-9/RES	\$1,079.0B	391.2K	2.60%	0.19%
RC	CR/LWAL+DUL/H:7-9/RES	\$1,079.0B	391.2K	2.60%	0.19%
	CR/LFM+DUL/H:1/RES	\$917.0B	16,821.4K	2.21%	8.34%
MCF	MCF/LWAL+DUL/H:1/RES	\$917.0B	16,821.4K	2.21%	8.34%
MCF	MCF/LWAL+DUL/H:2-3/RES	\$907.7B	2,694.7K	2.18%	1.34%
RC	CR/LWAL+DUL/H:10-15/RES	\$827.8B	205.4K	1.99%	0.10%
MCF	MCF/LWAL+DUL/H:4-6/COM	\$745.6B	407.3K	1.79%	0.20%
	CR/LFINF+DUL/H:4-6/COM	\$742.6B	391.6K	1.79%	0.19%
RC	CR/LDUAL+DUL/H:10-15/RES	\$702.5B	172.1K	1.69%	0.09%
	CR/LFINF+DUM/H:10-15/RES	\$702.5B	172.1K	1.69%	0.09%
OT	UNK/H:2-3/RES	\$678.3B	3,165.6K	1.63%	1.57%
RC	CR/LFINF+DUL/H:1/COM	\$668.7B	6,823.4K	1.61%	3.38%
	CR/LFINF+DUL/H:4-6/IND	\$575.7B	211.0K	1.38%	0.10%
MCF	MCF/LWAL+DUL/H:4-6/IND	\$562.0B	216.4K	1.35%	0.11%
	CR/LFINF+DUL/H:1/IND	\$529.9B	3,804.9K	1.27%	1.89%
RC	CR/LDUAL+DUL/H:7-9/RES	\$529.2B	199.1K	1.27%	0.10%
	CR/LFINF+DUL/H:2-3/COM	\$431.5B	1,061.7K	1.04%	0.53%
MUR	MUR/H:1/COM	\$404.9B	4,172.3K	0.97%	2.07%
RC	CR/LFINF+DUL/H:2-3/IND	\$359.0B	585.4K	0.86%	0.29%
OT	UNK/H:1/RES	\$339.2B	6,104.6K	0.82%	3.03%
MUR	MUR/H:1/IND	\$317.9B	2,324.8K	0.76%	1.15%
	CR/LFM+DUL/H:2-3/COM	\$284.3B	751.3K	0.68%	0.37%
RC	CR/LFM+DUL/H:10-15/RES	\$275.9B	87.2K	0.66%	0.04%
	CR/LWAL+DUL/H:4-6/COM	\$264.4B	149.6K	0.64%	0.07%