

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 = "Kazakhstan"
```

Exposure files:
Exposure_Com_Kazakhstan.csv
Exposure_Ind_Kazakhstan.csv
Exposure_Res_Kazakhstan.csv

Sanity checks and formats

Kazakhstan
Exposure/Exposure/Exposure_Com_Kazakhstan.csv
Exposure/Exposure/Exposure_Ind_Kazakhstan.csv
Exposure/Exposure/Exposure_Res_Kazakhstan.csv
Occupants / Dwellings = 3.2
Reference avg household size (2019) = 3.45
Population (exposure / UN_2021) = 1.0
Exposure models OK

Exposure at National level

Summary by occupancy type

	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
OCCUPANCY					
Res	18.9M	2,448.1K	\$235.5B	90.60%	85.74%
Ind	0.0M	47.4K	\$8.4B	1.76%	3.07%
Com	0.0M	206.4K	\$30.7B	7.64%	11.19%

Other metrics to consider

	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
OCCUPANCY				
Total	395.4M	\$228.5B	146	\$695
Res	350.6M	\$200.9B	143	\$672
Ind	10.1M	\$5.2B	213	\$835
Com	34.7M	\$22.4B	168	\$886

Exposure summary at Admin level 1

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
NAME_1						
South Kazakhstan Region	\$41.0B	523.0K	3,119.2K	14.92%	19.36%	16.48%
Almaty Region	\$40.0B	392.0K	2,078.0K	14.55%	14.51%	10.98%
Almaty	\$24.4B	202.2K	1,977.2K	8.90%	7.48%	10.45%
East Kazakhstan Region	\$23.2B	227.7K	1,363.8K	8.46%	8.43%	7.20%
Karaganda Region	\$19.6B	129.2K	1,375.9K	7.15%	4.78%	7.27%
Akmola Region	\$15.9B	141.5K	735.6K	5.77%	5.24%	3.89%
Kostanay Region	\$14.3B	123.2K	864.5K	5.20%	4.56%	4.57%
Kyzylorda Region	\$14.0B	129.0K	864.6K	5.09%	4.77%	4.57%
North Kazakhstan Region	\$13.9B	122.0K	543.7K	5.07%	4.51%	2.87%
Jambyl Region	\$13.2B	180.6K	1,139.2K	4.80%	6.68%	6.02%
Pavlodar Region	\$11.1B	83.7K	751.0K	4.04%	3.10%	3.97%
Aktobe Region	\$10.2B	112.5K	894.3K	3.70%	4.16%	4.72%
Atyrau Region	\$9.2B	93.0K	657.1K	3.35%	3.44%	3.47%
West Kazakhstan Region	\$9.0B	107.2K	661.3K	3.28%	3.97%	3.49%
Mangystau Region	\$8.5B	80.3K	719.4K	3.10%	2.97%	3.80%
Astana	\$7.2B	54.8K	1,184.4K	2.61%	2.03%	6.26%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MACRO_TAXO						
RC	\$80,303.0M	164.8K	842.5K	29.24%	6.10%	4.45%
MUR	\$62,535.2M	845.8K	6,382.2K	22.77%	31.30%	33.72%
ADO/E	\$41,842.0M	1,073.5K	7,439.3K	15.24%	39.73%	39.30%
MCF	\$41,287.8M	204.8K	1,583.6K	15.03%	7.58%	8.37%
S	\$21,721.1M	67.9K	447.0K	7.91%	2.51%	2.36%
W	\$12,061.8M	139.9K	893.9K	4.39%	5.18%	4.72%
MIX	\$11,127.2M	139.9K	893.9K	4.05%	5.18%	4.72%
OT	\$3,744.0M	65.3K	446.9K	1.36%	2.42%	2.36%

Exposure by taxonomy

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

	COST_USD	BUILDINGS	COST_USD_%	BUILDINGS_%
MACRO_TAXO	TAXONOMY			
MUR	MUR+CLBRS/LWAL+CDL/HBET:1-2/RES	\$50,587.9M	754,111	20.70%
MCF	MCF/LWAL+CDL/HBET:1-4/RES	\$39,619.1M	196,864	16.21%
RC	CR+PC/LWAL+CDL/HBET:5-9/RES	\$24,875.3M	13,140	10.18%
S	S/LFM+CDL/HBET:1-10/RES	\$19,439.0M	55,726	7.96%
ADO/E	EU+ETR/LWAL+CDN/H:1/RES	\$18,303.3M	511,611	7.49%
	MUR+ADO/LWAL+CDN/H:1/RES	\$18,240.4M	509,852	7.47%
RC	CR+CIP/LFINF+CDL/HBET:1-3/RES	\$15,444.3M	67,947	6.32%
	CR+CIP/LWAL+CDL/HBET:4-7/RES	\$11,787.1M	13,824	4.82%
W	W/LWAL+CDL/HBET:1-2/RES	\$8,411.0M	111,443	3.44%
MIX	MIX(MUR+W)/LWAL+CDL/HBET:1-2/RES	\$7,476.5M	111,443	3.06%
RC	CR+PC/LPB+CDL/HBET:5-9/RES	\$6,490.7M	3,421	2.66%
MUR	MUR+CLBRS/LWAL+CDL/H:1/COM	\$5,944.6M	46,992	2.43%
	MUR+CLBRS/LWAL+CDL/H:3/RES	\$5,324.3M	39,674	2.18%
	CR+CIP/LFINF+CDL/HBET:1-2/COM	\$4,776.9M	28,194	1.96%
RC	CR+CIP/LWAL+CDL/HBET:3-/COM	\$3,821.5M	5,872	1.56%
	CR+PC/LWAL+CDL/HBET:9-12/RES	\$3,800.4M	1,450	1.56%