

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 = "Vietnam"

Exposure files:
Exposure_Com_Vietnam.csv
Exposure_Ind_Vietnam.csv
Exposure_Res_Vietnam.csv

Sanity checks and formats

Vietnam
Exposure/Exposure/Exposure_Com_Vietnam.csv
Exposure/Exposure/Exposure_Ind_Vietnam.csv
Exposure/Exposure/Exposure_Res_Vietnam.csv
Occupants / Dwellings = 4.1
Reference avg household size (2019) = 3.84
Population (exposure / UN_2021) = 0.87
Exposure models OK

Exposure at National level

Summary by occupancy type

	OCCUPANTS	BUILDINGS	COST_USD	BUILDINGS_%	COST_USD_%
OCCUPANCY					
Res	85.8M	19,635.5K	\$312.0B	94.45%	86.04%
Ind	0.0M	74.8K	\$5.8B	0.36%	1.61%
Com	0.0M	1,078.5K	\$44.8B	5.19%	12.35%

Other metrics to consider

	AREA_SQM	COST_BUILDING_USD	AVG_BUILDING_AREA_SQM	AVG_COST_PER_AREA_USD
OCCUPANCY				
Total	1,706.9M	\$294,373.5M	82	\$212
Res	1,565.1M	\$261,387.5M	80	\$199
Ind	9.4M	\$3,485.9M	126	\$619
Com	132.4M	\$29,500.2M	123	\$338

Exposure summary at Admin level 1

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
NAME_1						
Ha Noi	\$32,873.2M	1,536.6K	6,451.9K	9.07%	7.39%	7.52%
Ho Chi Minh City	\$29,968.3M	1,452.1K	7,162.9K	8.26%	6.99%	8.34%
Thanh Hoa	\$13,507.5M	843.5K	3,400.6K	3.72%	4.06%	3.96%
Nghe An	\$12,615.3M	713.0K	2,912.0K	3.48%	3.43%	3.39%
Hai Phong	\$10,098.3M	468.5K	1,837.2K	2.78%	2.25%	2.14%
Dong Nai	\$9,909.9M	622.5K	2,486.2K	2.73%	2.99%	2.90%
Nam Dinh	\$9,270.0M	492.8K	1,828.1K	2.56%	2.37%	2.13%
An Giang	\$8,210.1M	497.3K	2,142.7K	2.26%	2.39%	2.50%
Hai Duong	\$7,899.0M	465.3K	1,705.1K	2.18%	2.24%	1.99%
Thai Binh	\$7,716.7M	496.9K	1,781.8K	2.13%	2.39%	2.08%
Binh Duong	\$7,438.7M	473.5K	1,481.5K	2.05%	2.28%	1.73%
Quang Ninh	\$6,990.2M	280.9K	1,145.0K	1.93%	1.35%	1.33%
Tien Giang	\$6,537.9M	438.9K	1,672.3K	1.80%	2.11%	1.95%
Binh Dinh	\$6,300.2M	370.5K	1,486.5K	1.74%	1.78%	1.73%
Dak Lak	\$6,216.6M	393.8K	1,733.6K	1.71%	1.89%	2.02%
Dong Thap	\$6,179.2M	405.9K	1,666.5K	1.70%	1.95%	1.94%
Bac Giang	\$5,924.4M	390.6K	1,554.1K	1.63%	1.88%	1.81%
Quang Nam	\$5,756.1M	361.0K	1,422.3K	1.59%	1.74%	1.66%
Kien Giang	\$5,710.2M	369.4K	1,688.2K	1.57%	1.78%	1.97%
Ha Tinh	\$5,669.0M	330.6K	1,227.0K	1.56%	1.59%	1.43%
Phu Tho	\$5,647.0M	335.5K	1,316.4K	1.56%	1.61%	1.53%
Thai Nguyen	\$5,575.8M	304.2K	1,123.1K	1.54%	1.46%	1.31%
Long An	\$5,531.7M	363.0K	1,436.1K	1.53%	1.75%	1.67%
Can Tho	\$5,222.3M	268.1K	1,188.4K	1.44%	1.29%	1.38%
Ben Tre	\$5,194.9M	355.9K	1,255.9K	1.43%	1.71%	1.46%
Quang Ngai	\$4,893.4M	302.8K	1,216.8K	1.35%	1.46%	1.42%
Lam Dong	\$4,880.0M	289.8K	1,187.6K	1.35%	1.39%	1.38%
Khanh Hoa	\$4,703.2M	263.8K	1,157.6K	1.30%	1.27%	1.35%
Da Nang	\$4,650.5M	205.7K	887.4K	1.28%	0.99%	1.03%
Soc Trang	\$4,632.2M	292.9K	1,292.9K	1.28%	1.41%	1.51%
Gia Lai	\$4,617.1M	282.5K	1,274.4K	1.27%	1.36%	1.48%
Hung Yen	\$4,581.7M	296.4K	1,127.9K	1.26%	1.43%	1.31%
Bac Ninh	\$4,558.7M	254.3K	1,024.5K	1.26%	1.22%	1.19%
Vinh Phuc	\$4,556.5M	244.6K	999.8K	1.26%	1.18%	1.16%
Ba Ria-Vung Tau	\$4,519.9M	251.0K	996.7K	1.25%	1.21%	1.16%
Ca Mau	\$4,447.1M	271.2K	1,206.9K	1.23%	1.30%	1.41%
Thua Thien Hue	\$4,407.0M	248.0K	1,087.4K	1.22%	1.19%	1.27%
Binh Thuan	\$4,368.3M	264.1K	1,167.0K	1.20%	1.27%	1.36%
Vinh Long	\$4,245.1M	271.8K	1,024.7K	1.17%	1.31%	1.19%
Tay Ninh	\$4,045.2M	275.4K	1,066.5K	1.12%	1.32%	1.24%
Ninh Binh	\$4,042.4M	227.7K	899.0K	1.11%	1.10%	1.05%
Son La	\$3,733.6M	230.8K	1,076.1K	1.03%	1.11%	1.25%
Phu Yen	\$3,676.3M	211.3K	862.2K	1.01%	1.02%	1.00%
Quang Binh	\$3,667.1M	205.7K	844.9K	1.01%	0.99%	0.98%
Tra Vinh	\$3,574.4M	238.4K	1,003.0K	0.99%	1.15%	1.17%
Binh Phuoc	\$3,316.3M	216.9K	873.6K	0.91%	1.04%	1.02%
Hoa Binh	\$3,242.8M	187.7K	785.2K	0.89%	0.90%	0.91%
Ha Nam	\$3,161.5M	211.6K	784.0K	0.87%	1.02%	0.91%
Lang Son	\$3,030.1M	173.3K	732.5K	0.84%	0.83%	0.85%
Yen Bai	\$2,948.7M	174.4K	740.4K	0.81%	0.84%	0.86%
Bac Lieu	\$2,947.9M	181.2K	856.5K	0.81%	0.87%	1.00%
Tuyen Quang	\$2,839.8M	175.5K	724.8K	0.78%	0.84%	0.84%
Quang Tri	\$2,784.9M	147.9K	598.3K	0.77%	0.71%	0.70%
Hau Giang	\$2,718.1M	180.4K	757.3K	0.75%	0.87%	0.88%
Ha Giang	\$2,439.0M	151.5K	724.5K	0.67%	0.73%	0.84%
Ninh Thuan	\$2,407.1M	125.4K	565.0K	0.66%	0.60%	0.66%
Lao Cai	\$2,337.4M	133.5K	614.6K	0.64%	0.64%	0.72%
Cao Bang	\$2,094.3M	120.7K	507.2K	0.58%	0.58%	0.59%
Kon Tum	\$1,746.0M	93.4K	430.1K	0.48%	0.45%	0.50%
Dak Nong	\$1,745.4M	114.8K	489.4K	0.48%	0.55%	0.57%
Dien Bien	\$1,690.4M	99.2K	490.3K	0.47%	0.48%	0.57%
Bac Kan	\$1,220.0M	71.7K	293.8K	0.34%	0.34%	0.34%
Lai Chau	\$1,191.3M	71.5K	370.5K	0.33%	0.34%	0.43%

Exposure by simplified taxonomy

Adding `MACRO_TAXO` column

	COST_USD	BUILDINGS	OCCUPANTS	COST_USD_%	BUILDINGS_%	OCCUPANTS_%
MACRO_TAXO						
MUR	\$169,385.7M	13,209.6K	51,589.0K	46.71%	63.54%	60.09%
RC	\$109,738.1M	1,790.2K	10,837.6K	30.26%	8.61%	12.62%
W	\$31,128.3M	2,428.8K	8,978.7K	8.58%	11.68%	10.46%
MIX	\$28,494.2M	2,051.9K	8,008.2K	7.86%	9.87%	9.33%
OT	\$10,216.4M	542.5K	3,387.9K	2.82%	2.61%	3.95%
MCF	\$5,896.2M	266.2K	1,096.8K	1.63%	1.28%	1.28%
ADO/E	\$5,851.0M	464.4K	1,948.7K	1.61%	2.23%	2.27%
S	\$1,913.0M	35.3K	0.0K	0.53%	0.17%	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			
MUR	MUR/LWAL+DNO/H:1/RES	\$82,271.8M	7,835,412	25.37%
	MUR/LWAL+DNO/H:2/RES	\$74,934.9M	4,757,772	23.10%
RC	CR/LFINF+DUL/H:4/RES	\$25,061.2M	33,415	7.73%
W	W+WBB/LPB+DNO/H:1/RES	\$19,583.4M	1,554,239	6.04%
MIX	MIX(M-W)/RES	\$17,655.4M	1,401,225	5.44%
	CR/LFINF+DUL/H:2/RES	\$17,362.2M	696,230	5.35%
RC	CR/LFINF+DUL/H:3/RES	\$15,066.5M	302,085	4.65%
	CR/LFINF+DUL/H:5/RES	\$12,172.3M	10,387	3.75%
OT	MATO/LN/HBET:1-2/EWME/RES	\$10,171.3M	538,164	3.14%
	CR/LFINF+DUL/H:1/RES	\$10,069.8M	605,700	3.10%
RC	CR/LDUAL+DUL/HBET:6-12/COM3	\$9,343.4M	5,061	2.88%
MIX	MIX(CR-W)/RES	\$7,281.6M	577,903	2.25%
W	W+WWD/LWAL+DNO/H:1/RES	\$5,864.0M	465,400	1.81%
ADO/E	EU/LWAL+DNO/H:1/RES	\$5,851.0M	464,369	1.80%
RC	CR/LDUAL+DUL/HBET:13-/COM3	\$4,115.1M	1,486	1.27%
MUR	MUR/LWAL+DNO/H:1/COM1	\$4,001.5M	400,153	1.23%
MCF	MCF/LWAL+DUL/H:2/RES	\$3,527.3M	132,604	1.09%