

Data and Analysis for Blog Post “Clouds in Your Coffee? Skyscrapers and their Symbolic Heights”

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January 19, 2021

The source of the data is from the CTBUH Skyscraper Center (<https://www.skyscrapercenter.com/buildings>). Note that the website was recently changed, and data sets are now available for CTBUH members. The database contains information on nearly all 80-meter or taller buildings around the world.

For each building, the database gives the architectural height (height to the top excluding antenna), the year of completion, the city, and country, and the use of the building (e.g., offices, or offices/residential, etc.). Since the interest is in “Vanity Height” for tall buildings, the focus here is buildings that are 90 or 100 meters or taller, depending on the analysis. For the entire subsample, offices and residential comprise about 72% of the sample. The rest are either government buildings, hospital, other types of commercial (e.g., casinos or retail) or mixed use.

The data was collected by [Remi Jedwab](#) of George Washington University; and I am grateful that he shared the data set for this post. For more uses of the data set, please see our working paper, “[Cities Without Skylines: Worldwide Building-Height Gaps and Their Implications.](#)”

For about 2,000 structures around the world, data is available for both the architectural height and the height of the top occupied floor. For this post, I define Vanity or Symbolic Height in percentage terms:

$$\text{Vanity/Symbolic Height} = 100 * \frac{\text{Arcitectoral Height} - \text{Occupied Height}}{\text{Arcitectoral Height}}$$

Note that the original sample contained a few outliers that were removed. Some had negative Vanity/Syboolic Heights and others were clearly outliers that were likely errors in coding or measurement. The sample was restricted to buildings that had non-negative Vanity Heights and which had a ratio of architectural height per number of stories greater than 1.1 or less than 5.5 (the bottom and top 99th percentile respectively).

Here are descriptive statistics for buildings 90 meters or taller:

Variable	Obs	Mean	Std. Dev.	Min	Max
Architectural Height	1,943	176.8715	75.7537	90.2208	828.1416
Vanity/Symbolic (%)	1,943	10.21244	5.949452	.9433944	40.61625
Occupied Height	1,951	158.0728	66.43663	59.436	592.836
Stories	1,951	43.78524	16.06418	14	163
Arch Height (m)/Floors	1,951	3.610864	.5676213	2.495107	5.522259
Year Completed	1,951	2008.519	9.759599	1966	2018

Regression Results

The regressions below regressed Vanity/Symbolic Height (%) on year dummies, country dummies, and use dummies for buildings 90 meters or taller and built since 1966. Two specifications included the floor count as an additional control.

Regression 1: Just has year and building type dummies.

Regression 2 also includes country dummies.

Regression 3 also include building floor counts.

Regression 4 is same as 2 but is estimate via weighted least squares where weights were number of completions for each country-year.

Regression 5 is same as 3 but is estimated via weighted least squares.

Results are similar across specifications.

Dep. Var. is 100*(Architectural Height-Occupied Height)/Architectural Height.

	(1)	(2)	(3)	(4)	(5)
1966	-4.393 (-0.69)	-9.907 (-1.48)	-10.21 (-1.51)	-8.542 (-0.38)	-8.667 (-0.38)
1967	2.654 (0.60)	2.136 (0.51)	1.984 (0.47)	2.812 (0.21)	2.818 (0.20)
1968	2.838 (0.75)	1.749 (0.48)	1.653 (0.45)	2.2 (0.24)	2.146 (0.23)
1969	4.607 (1.21)	4.399 (1.22)	4.066 (1.12)	5.765 (0.63)	5.274 (0.57)
1970	-0.598 (-0.13)	-1.409 (-0.33)	-0.624 (-0.15)	-1.089 (-0.08)	-0.0399 (-0.00)
1971	2.996 (0.67)	1.949 (0.46)	2.443 (0.57)	2.603 (0.19)	3.248 (0.23)
1972	-1.05 (-0.38)	-1.627 (-0.61)	-1.84 (-0.69)	-0.644 (-0.12)	-1.023 (-0.19)
1973	-0.515 (-0.18)	-0.432 (-0.16)	-1.173 (-0.43)	0.571 (0.12)	-0.252 (-0.05)
1974	0.422 (0.15)	1.256 (0.46)	0.847 (0.31)	2.385 (0.39)	1.854 (0.30)
1975	-4.355 (-1.14)	-4.911 (-1.35)	-5.165 (-1.40)	-3.892 (-0.34)	-4.064 (-0.35)
1976	3.441 (1.14)	2.897 (1.01)	3.412 (1.18)	2.618 (0.46)	3.33 (0.58)
1977	-2.384 (-0.79)	-0.614 (-0.20)	-0.432 (-0.14)	0.152 (0.02)	0.265 (0.03)
1978	3.881 (0.65)	1.999 (0.35)	2.934 (0.51)	2.783 (0.15)	3.761 (0.20)
1979	1.788 (0.51)	1.987 (0.59)	2.576 (0.76)	3.235 (0.40)	3.991 (0.49)
1980	1.307 (0.41)	1.85 (0.61)	2.039 (0.67)	2.673 (0.37)	3.006 (0.41)
1981	-0.525 (-0.16)	-1.087 (-0.36)	-0.807 (-0.26)	-0.169 (-0.03)	0.102 (0.02)
1983	0.136 (0.05)	-0.472 (-0.17)	-0.22 (-0.08)	0.123 (0.02)	0.429 (0.07)
1984	5.004 (1.46)	4.745 (1.43)	5.012 (1.50)	4.251 (0.50)	4.814 (0.56)
1985	0.947 (0.31)	-0.581 (-0.20)	-0.317 (-0.11)	0.219 (0.05)	0.566 (0.12)
1986	1.383 (0.54)	1.457 (0.59)	1.533 (0.62)	0.33 (0.06)	0.624 (0.12)
1987	5.44	4.45	4.606	4.692	4.964

	(1.42)	(1.23)	(1.26)	(0.65)	(0.68)
1988	1.85	2.005	2.162	3.868	4.105
	(0.67)	(0.76)	(0.81)	(0.72)	(0.75)
1989	0.0472	0.299	0.592	1.723	2.187
	(0.02)	(0.12)	(0.23)	(0.33)	(0.41)
1990	4.015	4.415*	4.058*	5.843	5.23
	(1.56)	(1.81)	(1.65)	(1.30)	(1.15)
1991	3.125	3	3.37	3.109	3.57
	(1.22)	(1.23)	(1.37)	(0.65)	(0.74)
1992	4.367*	4.609**	4.529**	6.143	6.035
	(1.85)	(2.06)	(2.01)	(1.47)	(1.43)
1993	0.576	2.609	2.791	2.996	3.257
	(0.19)	(0.91)	(0.96)	(0.48)	(0.52)
1994	3.696	4.795	5.280*	6.133	6.854
	(1.16)	(1.57)	(1.72)	(0.85)	(0.94)
1995	0.517	1.569	1.545	4.18	4.343
	(0.18)	(0.57)	(0.56)	(0.69)	(0.71)
1996	5.833**	4.962**	4.831*	7.67	7.675
	(2.27)	(2.02)	(1.94)	(1.44)	(1.42)
1997	8.126***	8.837***	8.640***	10.85*	10.94*
	(3.09)	(3.51)	(3.41)	(1.88)	(1.88)
1998	3.523	3.654*	3.757*	4.806	4.878
	(1.57)	(1.70)	(1.73)	(1.18)	(1.18)
1999	2.274	2.476	2.639	3.478	3.774
	(1.08)	(1.23)	(1.29)	(0.91)	(0.98)
2000	2.651	3.14	3.351	3.689	4.024
	(1.26)	(1.55)	(1.64)	(0.98)	(1.05)
2001	2.756	2.993	3.112	4.838	5.128
	(1.29)	(1.46)	(1.51)	(1.27)	(1.32)
2002	4.905**	4.407**	4.792**	5.637	6.332
	(2.17)	(2.04)	(2.20)	(1.40)	(1.55)
2003	3.997*	3.423*	3.656*	4.631	4.988
	(1.87)	(1.69)	(1.79)	(1.22)	(1.30)
2004	5.243**	4.176**	4.458**	5.257	5.737
	(2.43)	(2.03)	(2.15)	(1.38)	(1.49)
2005	6.030***	5.496***	5.584***	5.369	5.603
	(2.82)	(2.70)	(2.72)	(1.41)	(1.46)
2006	4.682**	4.443**	4.617**	6.798*	7.336*
	(2.14)	(2.14)	(2.20)	(1.72)	(1.84)
2007	4.794**	3.451*	3.668*	4.81	5.123
	(2.28)	(1.73)	(1.82)	(1.29)	(1.35)
2008	3.804*	2.581	2.711	2.777	3.182
	(1.90)	(1.35)	(1.40)	(0.76)	(0.86)

2009	3.559*	2.272	2.517	3.107	3.328
	(1.79)	(1.20)	(1.32)	(0.85)	(0.90)
2010	2.985	1.626	1.697	2.303	2.53
	(1.52)	(0.87)	(0.89)	(0.63)	(0.69)
2011	4.173**	3.261*	3.368*	3.984	4.212
	(2.12)	(1.72)	(1.76)	(1.09)	(1.14)
2012	3.131	1.749	1.883	2.515	2.83
	(1.58)	(0.92)	(0.98)	(0.69)	(0.76)
2013	2.222	0.734	1.051	0.81	1.21
	(1.12)	(0.39)	(0.55)	(0.22)	(0.33)
2014	2.989	1.984	2.244	2.54	3.065
	(1.53)	(1.06)	(1.19)	(0.70)	(0.83)
2015	2.786	1.438	1.697	2.296	2.714
	(1.43)	(0.77)	(0.90)	(0.63)	(0.74)
2016	2.57	1.424	1.595	2.641	3.061
	(1.29)	(0.75)	(0.83)	(0.72)	(0.83)
2017	2.3	1.132	1.269	2.345	2.662
	(1.17)	(0.60)	(0.67)	(0.65)	(0.72)
2018	1.65	0.334	0.262	1.552	1.626
	(0.83)	(0.18)	(0.14)	(0.43)	(0.44)
floors_above		-		-	
		0.0531***		0.0558***	
		(-5.77)		(-6.71)	
Argentina		-2.936	-3.125	-2.561	-2.955
		(-1.04)	(-1.09)	(-0.54)	(-0.61)
Australia		-1.752*	-1.463	-1.335	-1.314
		(-1.92)	(-1.59)	(-1.10)	(-1.07)
Austria		-0.0205	0.436	-0.344	0.0146
		(-0.01)	(0.17)	(-0.05)	0.00
Azerbaijan		2.014	2.109	2.267	2.194
		(0.71)	(0.74)	(0.29)	(0.28)
Bahrain		10.96***	10.86***	14.03*	13.52
		(3.37)	(3.32)	(1.67)	(1.59)
Belarus		11.39**	11.82**	11.13	11.33
		(2.08)	(2.14)	(0.59)	(0.60)
Belgium		5.885*	6.439*	5.333	5.683
		(1.77)	(1.92)	(0.48)	(0.51)
Brazil		-3.300**	-3.051**	-2.363	-2.259
		(-2.27)	(-2.08)	(-0.92)	(-0.87)
Cambodia		-4.877	-3.888	-5.238	-4.098
		(-0.89)	(-0.70)	(-0.28)	(-0.22)
Canada		-1.808**	-1.697*	-1.405	-1.49
		(-2.04)	(-1.90)	(-1.34)	(-1.41)
Chile		-1.829	-2.831	-1.427	-2.78

	(-0.47)	(-0.72)	(-0.11)	(-0.21)
China	0.312	0.0776	-0.158	-0.563
	(0.37)	(0.09)	(-0.16)	(-0.57)
Colombia	-10.23***	-10.28***	-10.38	-10.57
	(-3.18)	(-3.17)	(-1.23)	(-1.24)
Costa Rica	0.375	1.213	-0.00946	0.749
	(0.10)	(0.31)	(-0.00)	(0.06)
Croatia	-9.410**	-8.806**	-9.481	-8.901
	(-2.30)	(-2.14)	(-0.69)	(-0.64)
Czech Republic	11.09**	11.91**	10.3	11.01
	(2.00)	(2.13)	(0.55)	(0.58)
Denmark	-5.594	-4.723	-6.384	-5.627
	(-1.01)	(-0.85)	(-0.34)	(-0.30)
Ecuador	-4.037	-3.939	-3.637	-3.883
	(-0.74)	(-0.71)	(-0.19)	(-0.21)
Estonia	-1.115	0.705	-2.801	-0.699
	(-0.20)	(0.13)	(-0.15)	(-0.04)
Ethiopia	12.09**	13.14**	12.28	13.17
	(2.21)	(2.38)	(0.66)	(0.70)
France	1.496	1.922	0.542	0.896
	(0.84)	(1.06)	(0.11)	(0.18)
Georgia	-2.933	-3.011	-3.213	-3.413
	(-0.54)	(-0.55)	(-0.17)	(-0.18)
Germany	-4.453***	-4.236***	-4.994	-4.995
	(-2.86)	(-2.70)	(-1.28)	(-1.26)
Hong Kong SAR, China	-2.744***	-2.934***	-3.205**	-3.468***
	(-2.92)	(-3.10)	(-2.49)	(-2.66)
India	-0.564	-0.888	-1.636	-2.131
	(-0.36)	(-0.56)	(-0.61)	(-0.78)
Indonesia	1.89	1.995	1.228	1.172
	(1.52)	(1.59)	(0.69)	(0.65)
Iran	-0.114	0.794	-0.4	0.308
	(-0.02)	(0.14)	(-0.02)	(0.02)
Iraq	11.36*	9.358	8.571	6.388
	(1.69)	(1.38)	(0.44)	(0.32)
Israel	-2.621*	-2.388*	-1.886	-1.683
	(-1.88)	(-1.70)	(-0.73)	(-0.65)
Italy	1.59	1.86	3.797	3.928
	(0.82)	(0.95)	(0.95)	(0.97)
Japan	-4.775***	-4.452***	-4.973***	-4.920***
	(-4.91)	(-4.55)	(-3.70)	(-3.62)
Jordan	-0.0722	0.31	-0.0283	0.285
	(-0.01)	(0.06)	(-0.00)	(0.02)

Kenya	14.19*** (3.63)	14.80*** (3.75)	14.08 (1.06)	14.47 (1.08)
Kuwait	4.962* (1.94)	4.049 (1.58)	7.577 (1.06)	6.563 (0.91)
Latvia	8.801 (1.59)	9.354* (1.67)	8.651 (0.46)	8.954 (0.47)
Lebanon	0.657 (0.19)	0.0978 (0.03)	0.221 (0.03)	-0.466 (-0.05)
Macao SAR, China	2.9 (0.82)	3.096 (0.87)	4.055 (0.42)	4.138 (0.42)
Malaysia	0.307 (0.20)	-0.307 (-0.20)	-0.0852 (-0.03)	-0.87 (-0.26)
Mexico	-3.165** (-2.03)	-3.022* (-1.92)	-4.375 (-1.53)	-4.416 (-1.52)
Mongolia	-11.50** (-2.09)	-10.92** (-1.96)	-11.68 (-0.62)	-11.34 (-0.60)
Netherlands	-3.689* (-1.69)	-2.997 (-1.36)	-6.142 (-1.10)	-5.187 (-0.92)
New Zealand	11.40** (2.08)	12.30** (2.23)	11.48 (0.61)	12.37 (0.65)
North Korea	0.451 (0.17)	0.67 (0.25)	-1.512 (-0.21)	-1.412 (-0.19)
Norway	4.332 (0.78)	4.68 (0.84)	4.064 (0.22)	4.227 (0.22)
Panama	0.849 (0.36)	-0.223 (-0.09)	2.058 (0.40)	0.915 (0.18)
Peru	-2.881 (-0.87)	-2.441 (-0.73)	-2.509 (-0.23)	-2.187 (-0.19)
Philippines	-0.841 (-0.62)	-1.193 (-0.88)	-1.525 (-0.68)	-2.132 (-0.94)
Poland	0.535 (0.24)	0.446 (0.20)	1.494 (0.24)	1.07 (0.17)
Qatar	-2.005 (-1.18)	-2.565 (-1.50)	-3.746 (-1.04)	-4.639 (-1.27)
Republic of China (Taiwan)	-0.494 (-0.28)	-0.58 (-0.33)	0.897 (0.27)	0.866 (0.26)
Russia	-1.882* (-1.68)	-2.038* (-1.80)	-1.851 (-1.10)	-2.139 (-1.25)
Saudi Arabia	2.456 (1.40)	2.318 (1.31)	1.535 (0.44)	1.093 (0.31)
Singapore	9.707* (1.77)	10.12* (1.83)	10.09 (0.54)	10.18 (0.54)

South Africa		-1.22 (-1.27)	-1.513 (-1.57)	-0.423 (-0.39)	-0.811 (-0.74)
South Korea		0.157 (0.08)	0.472 (0.25)	0.68 (0.14)	0.749 (0.15)
Spain		-5.563** (-1.96)	-5.407* (-1.89)	-5.819 (-0.62)	-5.811 (-0.61)
Sweden		-8.214 (-1.50)	-7.963 (-1.44)	-7.98 (-0.43)	-7.929 (-0.42)
Switzerland		1.594 (1.06)	1.627 (1.07)	3.946 (1.58)	4.313* (1.70)
Thailand		-0.903 (-0.16)	-0.199 (-0.04)	-0.168 (-0.01)	0.209 (0.01)
Trinidad and Tobago		-4.112*** (-2.58)	-3.829** (-2.38)	-3.128 (-0.97)	-3.001 (-0.92)
Turkey		2.217 (1.12)	2.706 (1.36)	1.793 (0.36)	2.282 (0.46)
Ukraine		3.377*** (3.60)	2.803*** (2.98)	2.049* (1.83)	1.336 (1.18)
United Arab Emirates		-1.588 (-1.40)	-1.21 (-1.06)	-2.239 (-1.59)	-1.818 (-1.27)
United Kingdom		-0.335 (-0.42)	-0.276 (-0.34)	-0.196 (-0.21)	-0.224 (-0.24)
United States		-2.049 (-0.99)	-1.524 (-0.73)	-2.429 (-0.54)	-1.648 (-0.36)
Vietnam	7.120*** (3.74)	11.11*** (5.52)	8.657*** (4.36)	10.34*** (2.76)	7.747** (2.05)
N	1959	1959	1959	1959	1959
R-sq	0.148	0.265	0.251	0.207	0.187
adj. R-sq	0.095	0.19	0.175	0.126	0.104
AIC	12368.3	12211	12245.4	11908.1	11955.2
BIC	12664.1	12875	12903.9	12572.2	12613.6

Notes: Regression are for countries with at least one 90 m or taller building completed between 1966 and 2018. Years variables are year dummies variables, countries, are country dummies. All regressions include dummy variables for building types (not shown). Omitted year is 1982 and omitted country is Singapore. t statistics in parentheses; * p<0.10, p<0.05, *** p<00.01.