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The Competition for the Tallest Skyscraper: Implications for Global Ethics and Economics



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With a PhD in Philosophy, Christopher Michaelson helped launch a business ethics consulting practice with PricewaterhouseCoopers (PwC) in 1998 before taking a lectureship at the Wharton School of the University of Pennsylvania. Now associate professor of Ethics and Business Law at the University of St. Thomas, Opus College of Business, he has also been on the Business and Society faculty of New York University's Stern School of Business since 2005 and maintains an advisory role with PwC. Michaelson's clients have included MNCs, NGOs, and government institutions. His research integrates management and the arts to explore global ethics and meaningful work.

An iconic skyscraper has aesthetic significance that may have meaning for other aspects of human experience – serving, for example, as an expression of cultural and ethical values and a symbol of economic power. This study examines the competition for the world's tallest skyscraper as a symbolic, but also substantively significant, window through which to understand the relationship between economics, ethics, aesthetics, and human well-being. The study consists of an empirical component, analyzing skyscraper economics; and a philosophical inquiry on the social and ethical implications of the empirical data. The empirical component connects architectural data on the world's tallest skyscrapers to indicators of economic and ethical performance. The philosophical component explores the relationship between economic power and aesthetic and ethical values, raising normative concerns about the race to growth, without succumbing to the cultural paternalism that often pervades contemporary Western commentary on Eastern economic practices.

The Skyscraper as a Window on the World

If the Kingdom Tower in Jeddah is completed according to plan, it will become the world's tallest building in a few years time by a long margin. At more than a kilometer high, it would eclipse the Burj Khalifa, less than a decade after the Dubai landmark became the world's first megatall (600+ meters) building. Together, the buildings represent a shift in the

center of tallest skyscraper gravity, which from 1998 had visited Malaysia in the form of Kuala Lumpur's twin Petronas Towers and then Taipei 101 in 2004. The one-upmanship has not been this intense since it played out on a much smaller field in Manhattan during the Great Depression. In the aftermath of the Great Recession, the contest to build the world's tallest skyscraper will continue as long as new entrants are intent on announcing their fitness for a manufactured competition for global supremacy.

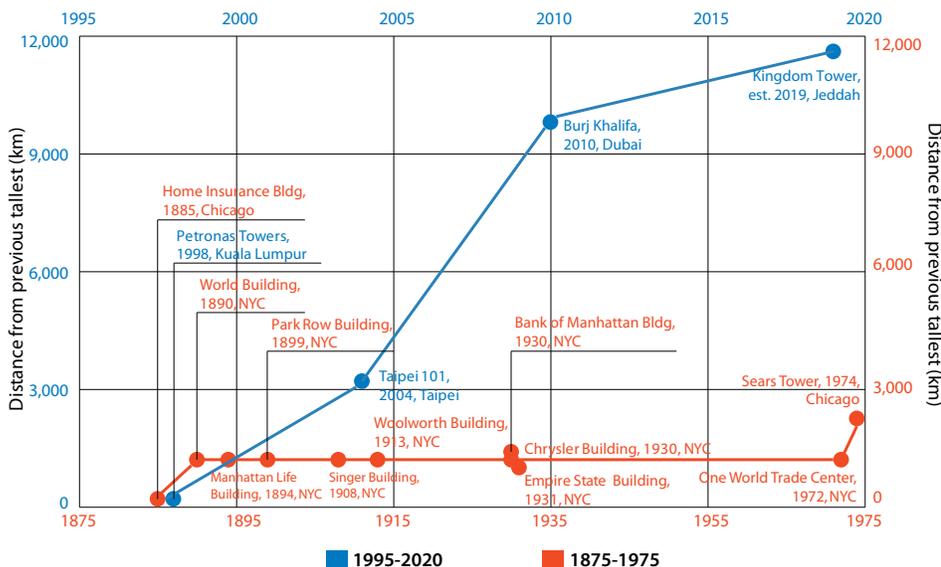


Figure 1. In the 25 years from 1995–2020, the location of the world's tallest skyscraper will move about five times the distance it moved in the entire century before (1875–1975). Source: Skyscraper data from the CTBUH Skyscraper Center; distance data from Distance Calculator, www.timeanddate.com

Increasingly, skyscraper construction is occurring in developing markets, and on one hand, the shifting center of skyscraper gravity appears to represent increasing economic development. On the other hand, these same skyscraping ambitions invite ethical criticism about misplaced priorities, emphasizing primitive spiritual aspirations to the heavens and rudimentary biological aspirations to size at the potential expense of well-being. The Burj Khalifa became a financial liability for an emirate needing outside assistance to weather a global recession. The Kingdom Tower is rising in a city woefully lacking in basic infrastructure, where in 2009 floods led to death and destruction, merely because the city did not have a basic drainage system (Al-Ahmed 2009).

The recent history of the skyscraper is a product and symbol of industrial advancement, and thus provides a window on the world through which to examine some of the most important ethical challenges arising from economic growth in developing markets. These challenges include such tangible issues as corruption, for which opportunities and incentives multiply as markets grow in size and complexity; and the natural environment, the stewardship over which is complicated by externalities and competing priorities. They also include intangible philosophical questions with practical consequences, including how to preserve cultural values while engaging in a global marketplace, and how to balance future investment with present needs. Much as the skyscraper competition transposes the inherited value of “growth for growth’s sake” into the economic present, these challenges have been confronted over and over throughout history and proliferated with industrialization. Can the skyscraper help societies learn from the mistakes of the past, or are we doomed to repeat them?

The Skyscraper as Symbol of Economic Ambition and Ethical Values

Symbolically, a skyscraper communicates meaningfully through its size, design, and technology to biological, aesthetic, and ethical values of human beings (De Botton 2006, Goodman 1985, Kingwell 2008, Petit 2002). Like literature and other arts (Michaelson 2012), a skyscraper may reflect cultural values at the same time that it influences them. Unlike other arts, however, a skyscraper is necessarily and always will be a major public-private venture, requiring aesthetic disinterestedness and economic interest, architectural imagination and practical engineering, and financial capital and resource coordination. In today’s world, as a product of political, economic, social, technological, and environmental negotiation, the skyscraper is arguably a market’s most audaciously tangible evidence of achievement and intangible representation of ambition. As a species of the technological sublime, the skyscraper evokes “awe and

“As a species of the technological sublime, the skyscraper evokes ‘awe and wonder, often tinged with an element of terror’ whether standing near the top looking down, at the base looking up, or even from afar, contemplating the magnitude of the enterprise.”

wonder, often tinged with an element of terror” (Nye 1994: xvi) whether standing near the top looking down, at the base looking up, or even from afar, contemplating the magnitude of the enterprise.

The biological aspiration to achieve, and the respectful fear of size, have roots in animal psychology, as demonstrated by the alpha male chimpanzee who deploys tree branches to enhance his stature when displaying (De Waal 1998, Goodall 1971). In ancient remnants of human civilization, height elicits awe, deference, and spiritualism, from the Great Pyramids at Giza, to the location of the Parthenon on the Acropolis, to the tiered form of Ming Dynasty pagodas (Dupré 2008). In scripture, the Tower of Babel represents reaching for the seat of God. But another reason the skyscraper stands as a particular and compelling symbol of contemporary power and values is that its technological possibility dates back only as far as the dawn of modern industrialization.

Although much of the positioning for ultimate supremacy occurred early in the skyscraper’s life – 10 of the 16 world’s tallest buildings were completed in the first 50 years (CTBUH 2008) – the skyward competition has accelerated dramatically in the past two decades. This changing landscape of skyscraper construction is part of an urbanizing trend that renders the city an important locus of economic and, potentially, democratic, life (King 2004). It is also reflected in skyscraper vocabulary: the term “skyscraper” was applied to the first steel-framed buildings, but more recently, the CTBUH coined the

term “supertall” to refer to buildings over 300 meters in height, and now uses “megatall” for buildings at least twice that height. Among completed skyscrapers, 7 of the tallest 10 in the world in 2014, and 72 of the tallest 100, were completed in 2000 or later. Although only two completed megatalls existed in 2014, five more were in progress (CTBUH Skyscraper Center). Twice as many supertalls were completed in 2010 than in 2000, and nearly four times as many will be completed in 2020 as in 2010, and the average height of the top 20 skyscrapers in 2020 will be almost megatall, at 598 meters (CTBUH 2011).

The shift in the geographical center of the skyscraper’s gravity is equally dramatic. As shown in Figure 1, in recent history, in roughly one-fifth the time, the location of the world’s tallest skyscraper will move approximately five times the distance that it did in the span of the so-called “American Century.” The changing geography of the skyscraper is a fairly sudden shift from West to East. From the 1930s to the 1970s, more than 90% of skyscrapers were in North America, dipping slightly to about 80% in the 1980s and 1990s. By the 2000s, more than half were outside North America – mostly Asia – and by the 2010s, more than 75% were outside North America, about equally distributed between Asia and the Middle East (CTBUH 2011). In this global society in which citizenship might transcend traditional political borders (Frey 2003), skyscraper symbolism is distinctly provincial, a source of jurisdictional pride and power.

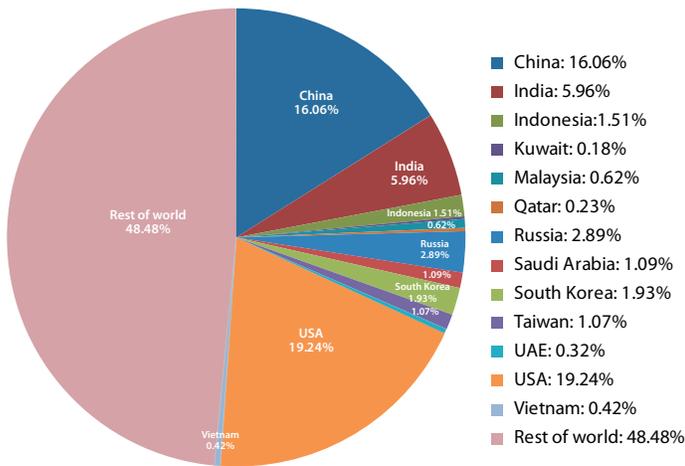


Figure 2. GDP share of world total est. 2014 based on PPP. Source: IMF

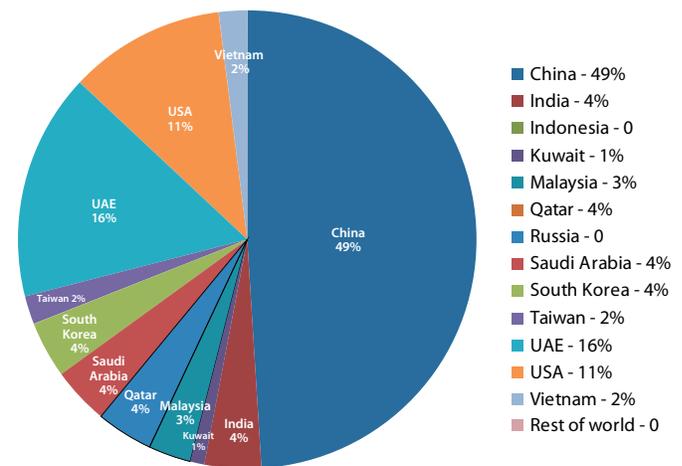


Figure 3. Height share based on number of buildings in top 100 in progress, topped out, or completed as of August 28, 2014. Source: CTBUH

Skyscraper Economics, Ethics, and Aesthetics: Data and Methods

The empirical data that follow accentuate the relationship between skyscraping ambitions and emerging economic power. That relationship is fairly well-trodden by experts and even well-known to laypeople. While relying on such data, the present study seeks to find potentially interesting stories within cracks and crevices between the economic and height data, pointing in the direction of normative analysis about the relationship between economic power and aesthetic and ethical values. The goal of the analysis is not necessarily to provide new information, but rather to present a finer way of looking at human advancement in at least three dimensions. In doing so, this study seeks to raise normative concerns about the race to growth without succumbing to the cultural paternalism that often pervades contemporary Western commentary on Eastern economic practices (Michaelson 2010, Said 1978).

The present study utilizes a list of the world's 100 tallest skyscrapers that were under construction, topped out, or completed (not including proposed, on hold, or demolished) as of the date of download from the CTBUH Skyscraper Center – March 27, 2014 (as a sign of the times, 7 of the top 10, and 51 of the top 100, were classified as under construction). The countries represented on this list are: China, India, Kazakhstan, Kuwait, Malaysia,

North Korea, Russia, Saudi Arabia, South Korea, Taiwan, the UAE, the United States, and Vietnam. Data were gathered on skyscrapers, economic, and well-being indicators for those 13 markets, along with selected data on two more (Indonesia and Qatar) anticipated to join the "Tallest 20 in 2020" list (CTBUH 2011).

The skyscraper data from which this analysis materializes come primarily from the Skyscraper Center database of the CTBUH. Additional data on aesthetic and environmental values were procured, when available, from design architect and building websites and other searches. The purpose of gathering this data was to answer such questions as:

- Did the design architect have a cultural – as imperfectly indicated by geographic proximity – connection to the market in which the building was located,
- Was the design of the building internationally renowned?
- Was the style of the building influenced by cultural markers?
- Was the building designed for environmental sustainability in any publicly recognizable way, given that buildings and the energy they consume account for more than half of greenhouse gas emissions? (AIA 2009).

Economic trend data come from the IMF's *World Economic Outlook 2014* database. Two well-being indicators, one measuring human

development and the other measuring corruption perceptions, were chosen because of their widely accepted (though not uncontroversial) authority, the contrast in thematic focus between them, and the longevity of available data. The UNDP Human Development Index (HDI), calculated since 1990, measures human development primarily as a function of education, health, and economic data, suggesting that well-being is not a measure of economic growth alone, but also of wealth distribution and other complex, non-economic factors. Transparency International's Corruption Perceptions Index (CPI), available since 1995, measures perceived levels of public-sector corruption, which is relevant not only to quality of life, but also particularly to such major infrastructure projects as skyscraper construction. The construction industry is regarded by reputation as being vulnerable to corruption and highly dependent upon collaboration (and sometimes collusion) between the public and private sectors.

All of this is likely to give the false impression that this study is more empirically grounded than it is intended to be. There are legitimate reasons to challenge; the statistical significance of the data as collected here, including the arbitrary cut-off points and dates of lists of 10, 12, 20, and 100; the small sample sizes of markets, data points about markets, and skyscrapers within lists; the general lack of availability – and presence of subjectivity – of design and environmental

Country	Average 1996–2005	2014	2019
China	9.2%	7.5%	6.5%
India	6.4%	5.4%	6.8%
Indonesia	2.6%	5.4%	6.0%
Kuwait	5.0%	2.6%	3.9%
Malaysia	4.7%	5.2%	5.0%
Qatar	9.7%	5.9%	6.4%
Russia	3.8%	1.3%	2.5%
Saudi Arabia	3.3%	4.1%	4.3%
South Korea	4.8%	3.7%	3.8%
Taiwan	4.4%	3.1%	4.5%
UAE	5.8%	4.4%	4.2%
USA	3.4%	2.8%	2.2%
Vietnam	7.1%	5.6%	6.0%

Table 1. Estimated annual GDP growth. Source: IMF World Economic Outlook (August 2014)

data about skyscrapers; the time-specificity and ever-changing nature of data collected, and so on. This list will change dramatically in the coming years, and so as an historical, time-bound document, this article is of limited use. The empirical data here have been collected from a host of reliable sources, but they should be considered directionally interesting rather than statistically significant. The data in this study are thus a short-term means to a long-term end, enabling normative analysis of attitudes toward power and associated aesthetic and ethical values.

Skyscraper Economics, Ethics, And Aesthetics: Analysis

Height share is a leading indicator of economic ambition, not a lagging indicator of economic achievement

This study introduces the concept of “height share,” the rough skyscraper equivalent of the economic notion of market share. All other things equal, if skyscraper height were a symbol of actual economic power, we would expect to see great skyscrapers arise in relative proportion to great economies. However, what we see in fact is dramatically different. As shown in Figure 2, the combined GDP (i.e., market share) of the 15 countries represented in this study comprises just over half of global GDP, meaning the rest of the world comprises

Country	Height share of top 20 in 2014 (# of buildings)	%	Height share of top 20 in 2014 (m)	%	Height share of top 20 in 2020 (# of buildings)	%	Height share of top 20 in 2020 (m)	%
China	13	65%	7,341	62%	9	45%	5,065	42%
India	0	0%	0	0%	0	0%	0	0%
Indonesia	0	0%	0	0%	1	5%	638	5%
Kuwait	0	0%	0	0%	0	0%	0	0%
Malaysia	0	0%	0	0%	0	0%	0	0%
Qatar	0	0%	0	0%	1	5%	551	5%
Russia	0	0%	0	0%	0	0%	0	0%
Saudi Arabia	2	10%	1,601	13%	2	10%	1,601	13%
South Korea	1	5%	555	5%	3	15%	1,705	14%
Taiwan	1	5%	508	4%	1	5%	508	4%
UAE	1	5%	828	7%	2	10%	1,344	11%
USA	2	10%	1,082	9%	1	5%	541	5%
Vietnam	0	0%	0	0%	0	0%	0	0%

Table 2.: Height share in # of buildings vs. in meters. Note: Blue means greater or equal share in # of buildings as in meters; red means greater share in meters. Source: CTBUH Skyscraper Center (August 28, 2014) and CTBUH 2011.

almost 49%. However, 100% of height share among the tallest 100 skyscrapers belongs to just 13 countries, as illustrated in Figure 3. One method of measuring height share of the top 100 skyscrapers in 2014 is to count the number of buildings a country places in the top 100. Indonesia, Qatar, and the rest of the world each have a 0% share in 2014. Height share thus far outstrips market share, suggesting that the symbolic ascent to power occurs ahead of the substantive realization of power. Moreover, as is evident from GDP growth rates in Table 1, GDP market share is not about to catch up with height share.

Moreover, interestingly and ironically, small differences might have large significance. Table 2 compares height share as a function of number of buildings in the top 20 to height share as a function of the number of meters of total height in the top 20. In 2014, five markets (China, Russia, South Korea, Taiwan, and the United States) have a greater or equal height share in terms of number of buildings than their height share in meters, whereas two have the reverse (Saudi Arabia and the UAE). In 2020, Qatar joins the five markets in the former category. What this shows is that the former are generally building more but lower, and the latter are generally building fewer and higher, in relative terms. There may be at least two explanations for this contrast. First, Saudi Arabia and the UAE are newer to the game of

skyscraper construction, gaining momentum in the era of the megatall. Or second, in the race to the tallest, some markets take the principle of “tall for tall’s sake” to a greater extreme than others.

Symbolic power, in the form of an iconic skyscraper, can be purchased, unlike substantive progress on human well-being measures

There is a complicated relationship between skyscraper growth and economic growth, and economic growth has an equally complicated relationship with general well-being (Friedman 2005, Nussbaum 2011, Sen 1988). But is there any discernible relationship between skyscraper growth and general well-being?

To explore this question, performance on well-being indicators was examined in the period of time between a country’s first entry into the community of supertalls (the date of entry was considered to be the date of completion of the country’s first building that is on the current top 100 list, which cuts off at about 330 meters) and the date of data gathered for the most recent reports issued for the HDI and CPI. Unfortunately, the sample size of available data is small, an indication not only that the supertall skyscraper is young, but also that the interest in non-economic indicators of well-being is at least as young.

Country	Completion date of first building in current top 100	Building	HDI rank as available for year closest to date of building completion	HDI value as available for year closest to date of building completion	HDI value in 2013 (in 2014 report)	HDI rank in 2013 (in 2014 report) (n=187)
China	1999	Jin Mao Tower	87	0.718	0.719	91
India	2015	World One	NA	NA	0.586	135
Indonesia	NA		NA	NA	0.684	108
Kuwait	2011	Al Hamra Tower	63	0.760	0.814	46
Malaysia	1998	Petronas Tower 1	61	0.772	0.773	62
Qatar	NA		NA	NA	0.851	31
Russia	2013	Mercury City Tower	NA	NA	0.778	57
Saudi Arabia	2012	Makkah Royal Clock Tower Hotel	57	0.782	0.836	34
South Korea	2016	Lotte World Tower	NA	NA	0.891	15
Taiwan	1997	Tuntex Sky Tower	NA	NA	NA	NA
UAE	2000	Emirates Tower 1	46	0.812	0.827	40
USA	1931	Empire State Building	NA	NA	0.914	5
Vietnam	2012	Keangnam Hanoi Landmark Tower	127	0.617	0.638	121

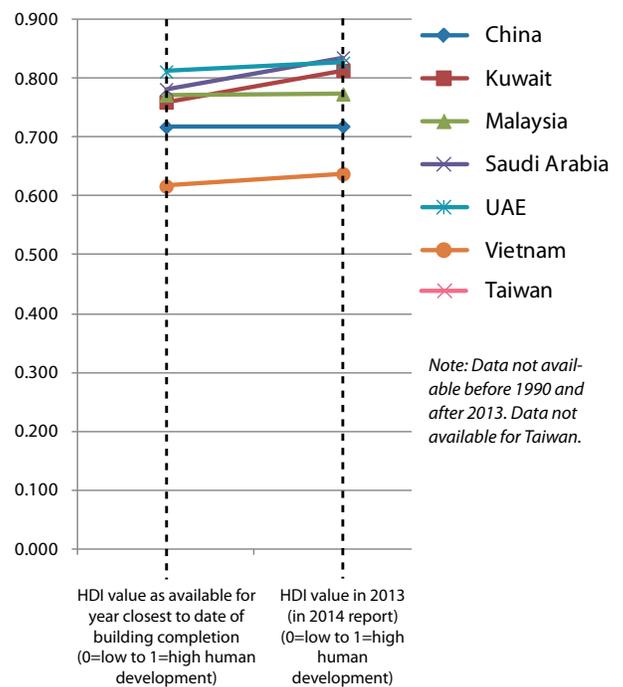


Figure 4. Change in UNDP HDI value from completion date of first building in current top 100 to 2013. Source: UNDP

Where comparative data are available between yesterday and today, the early returns are inconclusive about whether skyscraper growth attracts the kinds of growth that bring about non-economic well-being. As shown in Figures 4 and 5, the change in HDI and CPI values where comparisons are possible are unremarkable, with as many going up as down, and more staying about the same. Taiwan's CPI score is the only one showing material improvement but has had a comparatively long period of time (since 1997) for the change to occur. This suggests that it is comparatively easy to buy symbolic value (in the form of skyscrapers) but it is relatively difficult to make substantive improvements to general well-being (in the form of human development and corruption reduction).

This conclusion is a truism that should not be surprising, but it has not stopped many a country from attempting to buy notoriety. One notable failure was the canceled Russia Tower (BBC News 2008), and a near-failure was the delayed Ryugyong Hotel in North Korea (Demick 2008). Building supertall is indeed an impressive achievement, but one that is

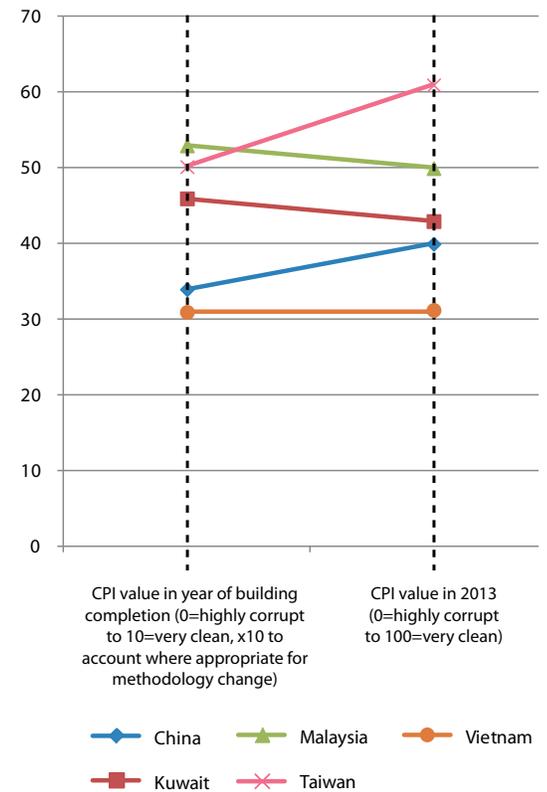
wrought with significant potential for failure. It raises the question: where does achieving human well-being stand in priority relative to constructing a skyscraping symbol of power?

Height falters, but design endures

Building tall is a one-dimensional sign of greatness in a multi-dimensional world, which is why most of today's iconic skyscrapers are likely to be forgotten someday when they appear positively short. Skyscrapers that endure are not only marvels of structural engineering and technology, but also emblems of aesthetic and ethical values, in the form of, for example, design excellence and energy efficiency. When a building is a cultural symbol of values other than size, harking back to ancient forms at the same time that it pursues future solutions to today's resource scarcity threats, it stands to be remembered and pays a long-term return on investment. To measure matters of aesthetic design – a longstanding but largely subjective construct – and ethical commitment to the environment – a relatively immature field of study – several data points were gathered. The geographical relationship between the design architect's headquarters and the

building location was examined as a potential indicator of the design relevance of home-country culture and values. Other design data gathered included design awards (including CTBUH awards, which do not date as far back as the completion date of some buildings in the sample). Environmental certification, as well as design for sustainability features, were recorded where that information was available. The building set studied for these purposes included not only the first entry of the 13 countries in the top 100, but also the first world's tallest building (where different) of the five countries that have earned that title (in order, the United States, Malaysia, Taiwan, the UAE, and Saudi Arabia) – resulting in the addition of four buildings: the Home Insurance Building in Chicago (the world's first skyscraper), Taipei 101 (the world's tallest skyscraper from 2004-2010), the Burj Khalifa in Dubai (the world's tallest completed skyscraper in 2014), and the Kingdom Tower in Jeddah (anticipated to be the world's tallest skyscraper in 2019). As with the well-being indicators, it was impossible not to recognize the general absence of reliable, objective data on the aesthetic and ethical indicators, suggesting their – regrettably – relatively low

Country	Completion date of first building in current top 100	Building	CPI rank in year of building completion	CPI value in year of building completion	CPI value in 2013	CPI rank in 2013 (n=177)
China	1999	Jin Mao Tower	58	34	40	80
India	2015	World One	NA	NA	36	94
Indonesia	NA		NA	NA	32	114
Kazakhstan	2016	Abu Dhabi Plaza	NA	NA	26	140
Kuwait	2011	Al Hamra Tower	54	46	43	69
Malaysia	1998	Petronas Tower 1	29	53	50	53
North Korea	NA	Ryugyong Hotel	NA	NA	8	175
Qatar	NA		NA	NA	68	28
Russia	2013	Mercury City Tower	NA	NA	28	127
Saudi Arabia	2012	Makkah Royal Clock Tower Hotel	NA	NA	46	63
South Korea	2016	Lotte World Tower	NA	NA	55	46
Taiwan	1997	Tuntex Sky Tower	31	50	61	36
UAE	2000	Emirates Tower 1	NA	NA	69	26
USA	1931	Empire State Building	NA	NA	73	19
Vietnam	2012	Keangnam Hanoi Landmark Tower	123	31	31	116



Note: Data not available before 1995 and after 2013, and for UAE in 2000.

Figure 5. Change in Transparency International CPI value from completion date of first building in current top 100 to 2013. Source: Transparency International

priority in the general study of global economics and culture.

Notwithstanding these data collection challenges, and the subjectivity of the enterprise, buildings were categorized with some level of confidence in repeatability into three general categories (see Table 3, page 44–45):

1. Skyscrapers designed for substantive well-being (generally, these reflected the intentional incorporation of culturally meaningful signifiers and a concern for the environment)
2. Skyscrapers designed for growth symbolism (generally, these reflected height as a primary priority to the general exclusion of other good things)
3. Skyscrapers with ambiguous cultural meaning (by far the largest group of buildings, which did not cleanly fit into the other two lists).

No doubt, critical bias played a role in the formation of these three lists, and every

building on it could be the subject of debate. In that spirit, the Kingdom Tower might be derided as representing the vain ambitions of wealthy power-brokers intent on hiring foreign architects with little appreciation for local cultural values in order to achieve “tall for tall’s sake.” By contrast, Taipei 101, with its culturally significant design features and its effort to retrofit for energy efficiency several years after completion stands as an iconic representation of values more important and

enduring than those that can be quantifiably measured. Like the Empire State Building, the design of which endures more than eighty years after its completion, Taipei 101 is more technologically and humanistically advanced than many tall buildings that have been started or completed or contemplated since. The Empire State Building holds a record not likely to be broken soon: that of world’s tallest for the longest period of time. This record stands as a reflection, for good or ill, of

“It is comparatively easy to buy symbolic value in the form of skyscrapers but it is relatively difficult to make substantive improvements to general well-being in the form of human development and corruption reduction.”

Country	Completion date of first building in current top 100 (*or of world's tallest)	Building	Height rank in world 2014	Height rank in country 2014	Design architecture firm (CTBUH first listed if multiple)	Design architect HQ (Firm website first listed if multiple)	Design architect geographic connection? (author analysis)
Skyscrapers designed for substantive well-being							
Taiwan	2004*	Taipei 101	14	1	C.Y. Lee & Partners	Taipei, Taiwan	Yes
USA	1931	Empire State Building	53	5	Shreve Lamb & Harmon Associates	New York, USA	Yes
Skyscrapers designed for growth symbolism							
Saudi Arabia	2019*	Kingdom Tower	1	1	Adrian Smith + Gordon Gill Architecture	Chicago, USA	No
Skyscrapers with ambiguous cultural meaning							
China	1999	Jin Mao Tower	36	20	Skidmore, Owings, & Merrill	Chicago, USA	No
India	2015	World One	27	1	Pei Cobb Freed & Partners	New York, USA	No
Kuwait	2011	Al Hamra Tower	38	1	Skidmore, Owings, & Merrill	Chicago, USA	No
Malaysia	1998	Petronas Tower 1	23	1	Cesar Pelli & Assocs	New Haven, USA	No
Russia	2013	Mercury City Tower	84	4	Frank Williams & Partners	New York, USA	No
Saudi Arabia	2012	Makkah Royal Clock Tower Hotel	7	2	Dar al-Handasah Shair & Partners	Beirut, Lebanon	Inconclusive
South Korea	2016	Lotte World Tower	9	1	Kohn Pederson Fox Associates	New York, USA	No
Taiwan	1997	Tuntex Sky Tower	73	2	C.Y. Lee & Partners	Taipei, Taiwan	Yes
UAE	2000	Emirates Tower 1	68	12	NORR Architects Engineers Planners	Toronto, Canada	No
UAE	2010*	Burj Khalifa	2	1	Skidmore Owings & Merrill	Chicago, USA	No
USA	1885*	Home Insurance Building	NA	NA	William LeBaron Jenney	Chicago, USA	Yes
Vietnam	2012	Keangnam Hanoi Landmark Tower	90	2	Heerim Architects & Planners	Seoul, South Korea	Inconclusive

Table 3. Comparison of tall building heights, design, origin, and implications on environmental sustainability and national prominence.

empires past – while also standing as a sign of deference to a world no longer in the thrall of empires, but rather, committed to the advancement of human well-being.

Empires Past and Future Well-being

This study instead shows a modern global competition whose participants are seemingly more intent on showing their ambitions before they have the substance to back them up, and on spending their capital before they have reached economic maturity. It raises concerns about the danger of unmitigated pursuit of power, a concern sometimes addressed, paternalistically, by “advanced” markets to “developing” markets

– even though such hubris appears to be a universal human flaw. The remedies for such flaws are normative prescriptions about aesthetic and ethical values that warrant priority over, and endure longer than, economic power. Despite the short-lived relevance of the particular data for this study, its messages are likely to remain the same, even as it hopefully plays a role to reduce the likelihood that its mistakes will be repeated. Buying status without attendant regard for ethical well-being and aesthetic quality only earns a fleeting reward. ■

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Design features (from web search, including firm or building website)	CTBUH design awards and other global designations	Environmental certifications (from LEED public database)	Environmental features (from web search, including firm or building website)
Pagoda style with bamboo stalk, significance of lucky number 8 (8 sections, 8 supercolumns), approved by Feng Shui master	2004 Popular Science's "Best of What's New" Award – Grand Award: Engineering Category; 2004 Emporis Skyscraper Award – Gold Award; The 5 th Far Eastern Architecture Award – Special Award; 2006 Taiwan Architecture Award	LEED Platinum	Retrofitted and redesigned in 2011 to achieve greater energy efficiency to become world's tallest LEED Platinum building (Yeh, J. 2011. "Taipei 101 'LEEDs' the Way Up." <i>The China Post</i> , May 29, 2011)
Lobby contains medallion designating the building at the center of the universe	Designated a historic place and landmark building	LEED Gold	
Streamlined form can be interpreted to resemble desert plant growth, fused with technology			
Tiered pagoda form	World Architecture Award Asia – Finalist	LEED Gold	Latticework exterior acts as pollution filter; self-rescue systems for fire/emergency
Emphasis on functional design to maximize views	Green Good Design Award		Designed to be one of the most environmentally sustainable developments in the world
Coiling wings resemble flowing Kuwaiti robes	CTBUH Best Tall Building Middle East and Africa Finalist; One of the best inventions of 2011 by TIME magazine; 2011 Emporis Skyscraper Award – Silver Award		
Basic plan of overlapping squares forms 8-pointed Islamic star, complex design typical of Malaysian architecture; peaks and bridge form the letter 'M'			Shading devices built into façade per tropical location, laminated glass
Vertical layout of multiple spheres of life: work, home, recreation, etc.	International Property Awards Europe 2013 – Best High-Rise Architecture		Collects melting water for reuse; 75% of work spaces daylighted; substantial use of local materials
Overlooks the Holy Haram site; advertises luxury living and retail consumerism			
Curvature and tapered form reflect Korean artistry; interior program spaces take inspiration from Korean art forms		Seeking LEED certification	
Shape of building based on a character that forms part of Kaohsiung City's name			
Frame the World Trade Center tower built by the prime minister's father	Winning entry in an unspecified international design competition, according to architect		Emphasis by design architect is on luxury: helipad with direct flights to airport; built on human-made island to evoke floating appearance
Triple-lobed footprint intended to evoke Hymenocallis flower, building intended to evoke Islamic onion domes	CTBUH Best Tall Building Middle East and Africa; CTBUH Global Icon Award	Office dev. in Burj Khalifa community is designated LEED Gold	Condensation from A/C used for landscaping; exterior uses reflective glazing to withstand outdoor heat
Transition from masonry to steel frame bearing weight; skyscraper pioneer		NA	Fireproof metal frame
Based on the Leap & Balance concept reflecting the leaping morale of Hanoi			

Note: The above list includes tall buildings which are still under construction.

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