

The Historical Development of the Tokyo Skyline: Timeline and Morphology

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Abstract

This article examines recent high-rise developments in Tokyo that have reshaped the mega-city's identity, and in particular defines the timeline of these drastic changes on the skyline. The research has focused on buildings over 150m tall¹ in Central Tokyo,² considering construction data in light of the city's historical development, economic models, legal framework, and technological restrictions. The objective of this research is to explain the processes that have led to the current skyline, and in particular explain the historical reasons that have led to what is often described as Tokyo's chaotic morphology.

Keywords: Tokyo; high-rise; skyline; tall buildings; Japan; economic growth; urban growth; skywards; economic downfall

1. Introduction

Tokyo is by far the world's most populous metropolis, with a population in the range of 33 to 35 million people, according to the CTBUH (2009) is also the third tallest city in the world in terms of its buildings' accumulative height. At the end of 2011, a total of 116 buildings over 150m tall stood in central Tokyo, with more than 550 buildings in excess of 100m located in the metropolitan area. In spite of a long-standing economic recession, Japan has actually experienced a huge boom in high-rise developments in the past two decades. This research will endeavor to explain the very recent developments in a city that is growing skywards at a remarkably fast pace, yet generally without a comprehensive urban vision. Skyscrapers have both detractors and advocates for a variety of reasons that lie outside the scope of this study. What will be argued here is that the proliferation of high-rise construction is not a result of planning or a response to architectural theories, but rather due to complex social, legal, economic, and political conditions.

2. Methodology

The research methodology is based on the quantification of the number and height of high-rise buildings built in Tokyo from the end of World War II until the end of 2011. Based on statistical data, the research will establish a clear timeline on high-rise

construction per year, quantifying both the number of buildings over 150m, as well the accumulative height of high-rise construction per year.

A careful historical analysis of construction and economic data suggests several ways of explaining Tokyo's skyward growth.

The research hypothesis is that due to economic and legal reasons, Tokyo has grown vertically in just a few years despite minimal planning, resulting in a chaotic morphology of high-rise structures retrofitted into the existing urban fabric.

3. History of Tokyo's High-Rise Developments

Tokyo is said to have reinvented itself three times in the 20th century: first after the Great Kanto Earthquake of 1923, again after the Tokyo air raids of 1945, and finally during the 1964 Olympics. There is a fourth reinvention that began in the mid-90s and is still taking place, as Tokyo transforms itself from a low-rise city into a city of towers.

Since the city of Edo took the name Tokyo in the late 19th century, the city's identity has been characterized by frequent change. The port of Yokohama opened its trade to foreigners in 1859; during the Meiji Restoration, Japan began not only to accept foreigners, but also to replicate Western models. As the century drew to a close, however, Tokyo was still a city of small wooden houses and temples that followed traditional Japanese urban patterns. Prone to earthquakes and fires, Tokyo became accustomed to rebuilding itself, and its inhabitants acquired a sense of the temporary over the permanent.

In 1923, almost three-quarters of the city was damaged or destroyed by the Great Kanto Earthquake; two-thirds of the buildings destroyed were actually consumed by the fires that burned for three days after the quake. At the time of the earthquake, the tallest

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building in Tokyo was the Ryoukaku Building (literally, "cloud scraper"), a brick tower 12 stories tall. It was thought to be an earthquake-proof building, as it had survived an 1894 quake that destroyed many brick chimneys. This time, however, the building collapsed from the 8th floor up (Fig.1.). As a result, brick architecture was brought into question and considered non-quake resistant. Tokyo would not see any structures of significant height until decades later.



Fig.1. Remains of the Ryoukaku Building After the 1923 Earthquake

A second wave of destruction devastated Tokyo in 1945, when American air raids during World War II destroyed the city. In particular, the March 10th raid by the U.S. Air Force damaged 30% of the city, leaving its center almost completely flat with only a few scattered buildings standing (Fig.2.). As Mori, Yamagata and Mau (2001) have noted Tokyo's future was in doubt, with some arguing that a large-scale reconstruction plan was too ambitious, yet the city proved capable of reinventing itself again. Japan was a strategically important location for the U.S. Army during the Korean and Vietnam Wars, and the high demand for Japanese goods contributed to Tokyo's robust resurgence. Following the Korean War, the economic growth of Japan was spectacular: as Krugman (2009) noted, "No other country...had ever experienced the GDP growth rates enjoyed by Japan from 1953 to 1973, as it transitioned from an agricultural nation to one of the most industrialized countries in the world. This economic expansion was due to an unprecedented government investment in infrastructure. According to Pernice (2006), "The priority given by the Japanese government to economic growth was the reason behind the promotion, since the late 1950s, of many public works for the construction of expressways, railways, dams, ports, and artificial harbors throughout the Japanese archipelago, but especially in the Tokyo, Osaka and Ise Bay areas. During that period the construction industry accounted for 30% of the total gross expenditure of Japan, and became the foundation of Japanese economic growth as one of the main industries of the country."



Fig.2. Central Tokyo After the 1945 Air Raids. Most Wooden Houses were Consumed by the Fires

This recovery enabled Tokyo to build its first-ever truly tall structure in 1958. The Tokyo Tower is a 332.5m Eiffel Tower knock-off that tops out just a few meters higher than its precedent (Fig.3.). As Seidensticker (2010) has noted historian Umesao Tadao called the building a "monument to Japanese lack of originality...It seems that the main purpose of the tower was to rise a bit over the Eiffel Tower and to lift up the spirits of Japanese people after the war." Tokyo Tower was just the starting point of what the city has become today.

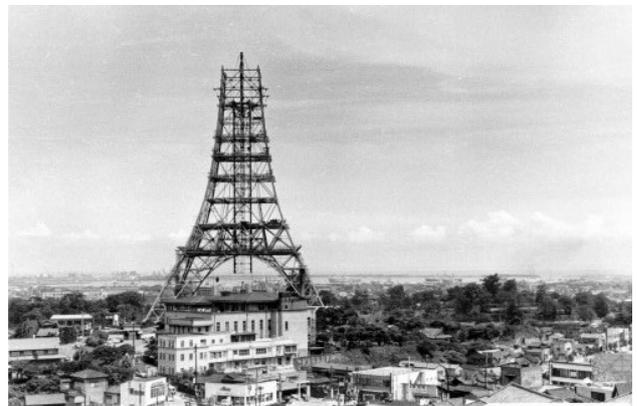


Fig.3. Beginning Phase of the Construction of the Tokyo Tower in 1958

The first envisioning of Tokyo as a high-rise city came during the postwar period with the Metabolism movement. An essential part of the Metabolist vision was mega-structures; as a result, the overlay of large urban projects onto existing dense fabrics became a common urban development strategy of the Metabolists. The visions of mega-structures that they proposed resembled some large-scale projects in America, not often seen in Japan at the time. As Pernice (2004) has noted some Metabolist architects proposed towers superimposed over the existing urban fabric, such as Tower City by Kiyonori Kikutake in

1963 and the Octa-dwelling by Kenji Ekuon in 1965, but these visionary projects were not further developed or built. While it is difficult to quantify how much influence the Metabolists have had on modern-day Tokyo, their proposals had theoretical influence in later developments by transmitting the idea of imposing large-scale structures over an existing urban fabric as an urban development strategy. These visions later became the trend in the development of high-rise structures in the city.

The hosting of the Olympic Games in 1964 was a crucial year for Tokyo. Having emerged from the postwar period with basic reconstruction complete, the city then implemented a program of road development. Several new hotels went up near the Imperial Palace to accommodate visitors to the Olympics. The tallest of these, the New Otani in Akasaka, became the tallest building in the city with 17 floors. Although not technically a skyscraper, it was a building of significant height, projecting noticeably on the skyline.

Regulations regarding earthquake resistance prohibited genuine high-rise buildings until the 1960s, when office tower construction was permitted in certain areas of the city. It was not until 1968, however, that Tokyo's first office tower was completed. At 147m, the 36-story Kasumigaseki Building introduced modern office high-rise construction to the city.

During the following years, this height record was beaten six times. The Kasumigaseki Building was soon followed in 1970 by the World Trade Center in Hamamatsucho at 40 stories or 150m tall, and in 1971, the Keio Plaza Hotel at 47 stories but under 200m. Three years later, the Mitsui Building topped out at 55 stories or 220m. The tallest of the first generation high-rises, the Sunshine Building in Ikebukuro, was built in 1978 on the former site of a prison. At over 240m tall, it would be the tallest building in Tokyo until 1992.³

This first boom of towers came to an end in 1979 with the completion of the Shinjuku Center Building at 223m. Most construction had begun right before the economic slump of 1973 and would not continue long past it. Between 1971 and 1979, however, the West Shinjuku district had become the first emulation of Manhattan, with seven buildings surpassing the 150m mark, through a very regular and organized master plan.

These tower developments were located mostly on former military land, where regulations regarding high-rises were eased and master plans put in place. The Shinjuku tower cluster was at this point an isolated group of towers with Mount Fuji as backdrop; the Sunshine building stood alone a few kilometers north in Ikebukuro, while the World Trade Center and Tokyo Tower punctuated the sky above Minato-Ku. The remainder of the city was quite flat with very few structures of significant height (Fig.4.).

There were few significant high-rise developments in the following decade, despite a strong economy.



Fig.4. Minato-Ku from Tokyo Bay in 1973, with the World Trade Center Building on the Front Right, and Tokyo Tower on the Center Left

From 1980 to 1989, only four buildings over 150m were completed in central Tokyo, all of them still under 180m. These new developments were no longer concentrated in Shinjuku, but scattered mainly throughout Minato-ku. The most notable example is Ark Hills in Akasaka, built in 1986, as it was the first one of a new urban development trend. Almazan and Tsukamoto (2009) defined it as the first of the Corporate Urban Centers: "Corporate Urban Centers are a recent urban typology initiated by the Ark Hills project in 1986. Even if today CUCs are scattered in a series of isolated interventions, they show a clear governmental policy that reinforces deregulation and privatization of urban development. This policy represents a new paradigm of production of urban space that gives prominence to large land-development corporations." As Meyer (2011) noted in an effort to explain the heterogeneity of Tokyo architecture, referring to Ark Hills: "it marked a distinctive new type of urban development: It is a form of high-rise clusters, where the developer, Minoru Mori, gathered several small parcels and built several towers, including both office and residential space."

Land prices had skyrocketed in Tokyo during the 1980s, initiating the bubble economy. As the real estate bubble began to burst in the 1990s, a significant number of high-rise construction projects had already begun. Following the burst, land prices fell sharply and Japan fell into an economic recession.¹² Ironically, an acceleration of tower construction occurred during this time, despite the recession. Real estate values dropped considerably, urban regulations regarding high-rise construction were eased, and towards the end of the decade, the Japanese Government injected capital into the economy. All of these factors fuelled the development of high-rise buildings in Central Tokyo.

During the nineties, a total of 19 buildings over 150m were built in Tokyo – more than the overall high-rise construction during the 1960s, 1970s, and 1980s combined. In just three years, from 1994 to 1996, 10

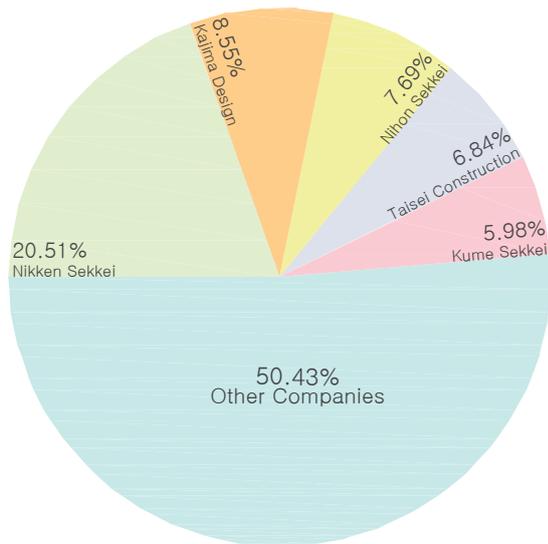


Fig.5. High-rise Design Companies in Japan and Percentage of Buildings Over 150m Designed by them by the Beginning of 2012

buildings over 150m were completed in the city. One could argue that the financial crash of 1991 caused the skyscraper boom – or, conversely, that the roaring economy of the previous decade led to a development boom during the bubble period. The salient point is that construction of high-rises not only did not cease, it actually sped up (Fig.7.).

At the beginning of the 21st century, the Urban Regeneration Act further eased regulations concerning Floor Area Ratio, thereby initiating a radical transformation process that led to the city's current state. During the next 12 years, the city grew skywards with an incredible total of 73 buildings surpassing the 150m mark completed in central Tokyo. By the end of 2010, in addition to the Tokyo Tower and the Skytree, another 556 buildings with heights above 100m were standing in Tokyo Metro, with 106 of them taller than 150m in the center of the city. This makes Tokyo one of the tallest cities in the world, ranking just behind Hong Kong and New York.

For the first time, a significant number of foreign architects with extensive experience in high-rise office design were called in to collaborate with local firms. Among their projects are some examples of high-rise construction that set precedents for future developments.

In 2001, Atago Hill Mori Tower and Forest Mori Tower were completed in the Roppongi area by architect Cesar Pelli, soon to be followed by other corporate urban centers, such as Roppongi Hills and Tokyo Midtown. Developed by Minoru Mori in 2003, Roppongi Hills was designed by New York architecture firm Kohn Pedersen Fox. In 2007, Tokyo Midtown opened, designed by Skidmore, Owings and Merrill; at 248m, it topped the previous height record by just a few additional meters. These new developments were clusters of towers, each comprising several buildings including exterior plazas, shopping centers, luxury hotels, museums, offices, and residences.

Several firms have been responsible for many of the building designs: as of 2012, a total of 49.6% of buildings over 150m were designed by just six architecture companies. In particular, Nikken Sekkei participated in the design of more than one-fifth of all the buildings in Tokyo over 150m (Fig.5.).

In 2008, the world economy entered the biggest economic recession since 1929, and Japan was particularly affected. Starting in 2009, Japanese GDP fell sharply, and construction in particular suffered a major slowdown. Yet, the development of towers in Tokyo continues, and as of 2014 numerous high-rise projects are still under construction in the city. Recently has been a shift, from a predominance of office buildings to more mixed-use and residential developments.

Among Tokyo's buildings exceeding 150m, 106 buildings (or 89%) were built since 1991, and 86 of them (or 72%) between the year 2000 and the end of 2011 alone (Fig.6.). Tokyo has a brand-new skyline, almost completely built in the past 20 years, but in particular over the past 12 (Fig.7.)

4. Urban Morphology of Tokyo High-Rises

Many reasons could be offered to explain why Tokyo embraced high-rise construction so late. The most significant were technical and legal, in particular earthquake resistance and urban safety regulation. After technological developments made it possible for modern skyscrapers to be safer in a catastrophe than most of the existing low-rise buildings, urban regulations were eased and the construction of towers was allowed in certain districts starting in the 1960s.

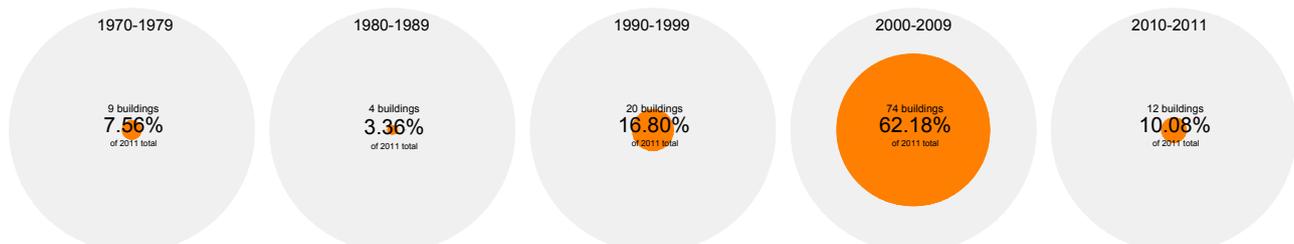


Fig.6. Percentage of Buildings Over 150m Built in Central Tokyo During Each Decade as a Percentage of the Total Number of Buildings (from 1970 to 2011)

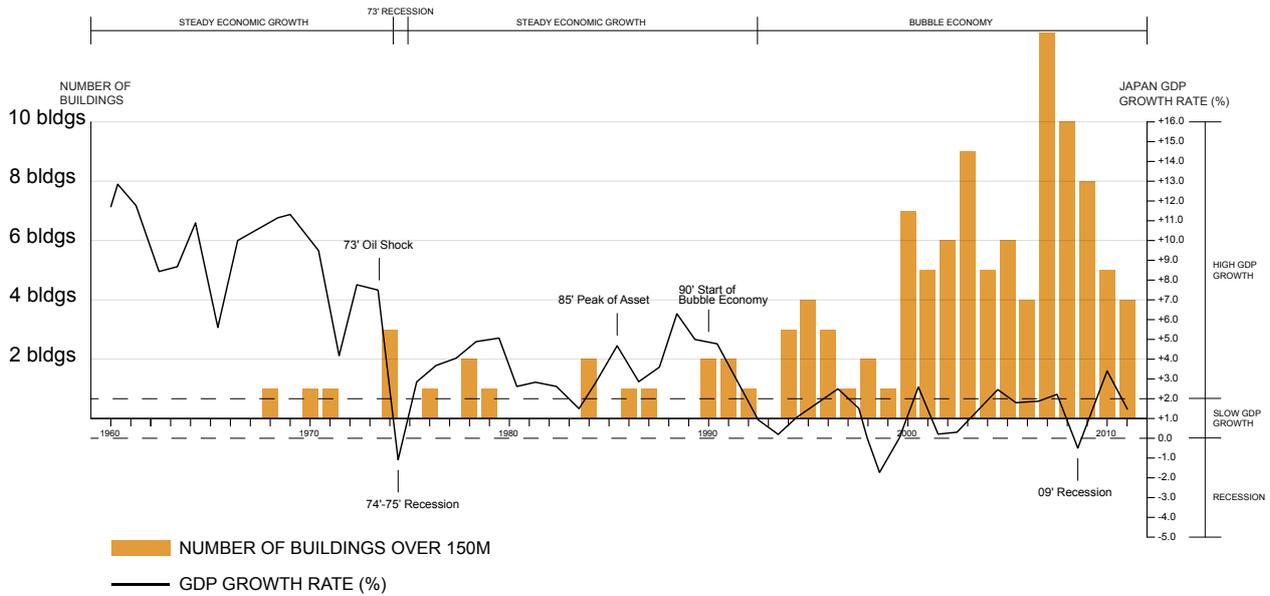


Fig.7. Number of Buildings Over 150m Built Per Year in Tokyo from 1960 to 2011 and Japan GDP Growth Rate (%)

Timeline and heights

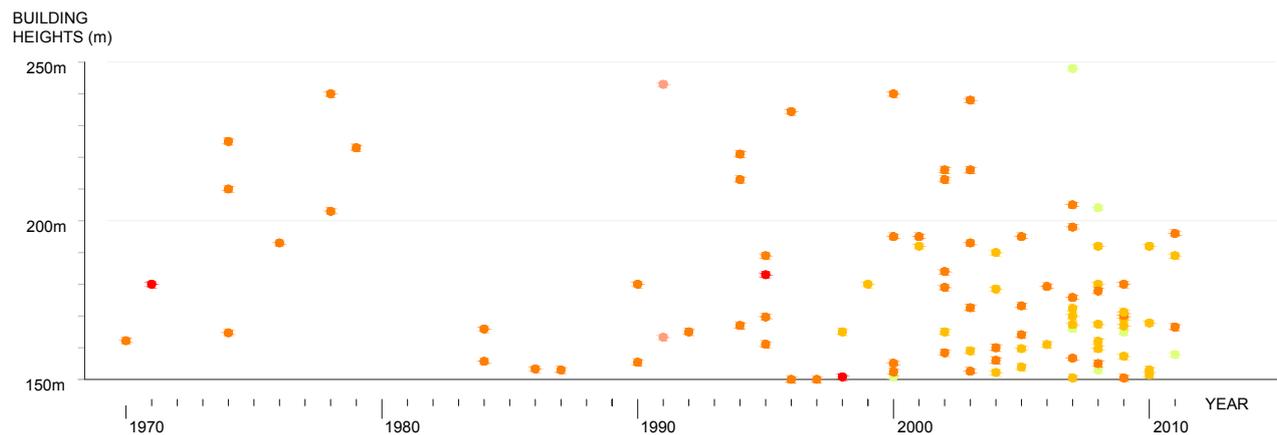


Fig.8. Buildings Over 150m Completed Each Year between 1970 and 2011 in Central Tokyo and their Heights

Another key issue was a lack of large land parcels where big developments could take place. Kogut (2006) noted that the modern-day urban fabric of Tokyo hails back to the Edo Feudal period (1600-1867), when land blocks consisted of large feudal lord estates (Daimyo), along with smaller samurai and religious properties. During the Meiji Restoration and the 20th century, these original feudal parcels were further subdivided. Even though, as discussed above, events such as the Great Kanto Earthquake and air raids devastated large swathes of the city, in each case the recovery effort maintained the previous structures of land division and ownership. Japan's high inheritance taxes encouraged families who inherited to sell a portion of the property to pay their liabilities. As Kitayama, Tsukamoto and Nishizawa (2010) have noted, what began as large plots for individual houses were often divided, and houses rebuilt on the new subdivided lots. Over several generations, lots grew smaller and smaller. Moreover,

the average lifespan of a Tokyo house is just 26 years. For this reason, sites large enough to undertake high-rise developments are very difficult to find in central Tokyo. As Daniell (2008) has noted: "It is the difficulty of assembling big blocks of land that keeps the city in such an incoherent state. While the government does have the right to relocate people for the sake of urban development projects, it is almost never exercised."

Some big plots of land previously owned by the army or the government were available for high-rise developments, as in the West Shinjuku high-rise cluster, but this was more the exception than the rule. Most of Tokyo's high-rise developments were not built on large sites owned by the government or the military, but on landfills in Tokyo Bay, in former industrial areas, or on lots put together by development groups who bought many small lots. Meyer (2011) has noted: "The small scale of [Tokyo's] parcels and legal restrictions regarding consolidation prevented

widespread construction of skyscrapers and resulted in a distinctive type of urban development. High-rise clusters like those built by the Mori Corporation have become a distinctive Tokyo phenomenon." The lack of large pieces of land resulted in a non-homogeneous spread of high rise structures, retrofitting into the existing urban fabric and generating a disorganized and scattered skyline (Fig.9.). Toyo Ito (1992) described Tokyo as "a fictitious imaginary urban space shaped like a collage of fragments that coexist with the real space; Tokyo is a simulated city filled with simulated life....a city like Tokyo is a shapeless city that we enter unwittingly."



Fig.9. Plan of Central Tokyo Showing the Location of Buildings Over 150m Tall Completed by the End of 2011

The high density and population of the city and the resulting congestion was another reason for the rejection of high-rise developments; however, more recently, economic concerns have taken precedence, as Asgarzadeh, Koga, Yoshizawa, Munakata, and Hirate (2010) have described. Economic factors explain the truth behind popular characterizations of Tokyo architecture as chaotic – Momoyo, Junzo and Tsukamoto (2010) explain how the city consists of "...shameless spatial compositions and functional combinations, unthinkable in the traditional European city." The authors go on to describe this reality, arguing that "*da-me*" architecture (no-good architecture) is really part of Tokyo's essence, "...its unthinkable typologies providing highly economical, functional answers with minimal effort." These principles certainly apply to its high-rise construction, and the new, chaotic skyline blends in with the surrounding chaotic fabric. Tokyo is a self-organizing system without a clear hierarchy, according to Johnson (2002) seeming to respond to bottom-up self-organizing processes.

5. Conclusions

Japan initially rejected the high-rise structures as a viable urban development solution because of concerns about congestion and earthquake safety. Skyscrapers were introduced in the city slowly, starting in the early 1970s, and mainly in West Shinjuku through a careful master plan. Then the high-rise boom began in the mid-90s, catalyzed by the Economic Slump of 1991 and without much planning.

Even if movements such as Metabolism had great, cohesive visions for Tokyo in the 1960s, those visions, with a few notable exceptions, were not realized into a significant number of buildings or master plans. Yet, some of their ideas foreshadowed the trend of high-rise developments that took place several decades later. In their proposals they postulated that the imposition of large structures over an existing fabric was a viable urban development option, and it was indeed followed by the next generation of architects, planners, developers and politicians. Tokyo was never conceived as a high-rise city, and no real strategies were put in place to plan for the city's unexpected and rapid growth skywards. For example, more than 89% of high-rise buildings (over 150m tall) in Tokyo were built after 1991, lacking supporting infrastructure and surrounded by tiny buildings of heterogeneous heights, styles, and sizes. As Daniell (2008) has noted: "the visual disorder of the contemporary cityscape is a reflection of urban Japan's capacity to absorb constant small scale reorganization and the near impossibility of large scale restructuring."

Taking into account legal regulations, economical, social and political factors in conjunction with statistical data, the research concludes that due to the policies put in place after the economic slump of 1991 and the lack of urban planning, an unprecedented boom in high-rise construction took place in Tokyo since the mid-1990s. In an unplanned and unexpected way, this chain of events has reshaped the city's identity.

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Notes

- ¹ According to the Council of Tall Buildings and Urban Habitat, there is not a specific height for a building to be considered a skyscraper or a high-rise, as it depends on the context. Common heights in the metric system used for classification purposes are 80m, 100m and 150m. The 150m cut-off has been used for the purpose of this research.
- ² This research focuses on central Tokyo, and not on the Tokyo Metropolitan area or Kanto region. The tallest building in the greater metropolitan area is the Yokohama Landmark Building, located in Kanagawa, which has not been included in this research.
- ³ For the purposes of this research, the *Tokyo Tower* and *Tokyo Skytree Tower* are considered communication towers and not buildings, following the CTBUH standards. As a result, when the tallest building of Tokyo is referred to for each period, these two towers have not been included.