



**2022 ULI ASIA PACIFIC
HOME ATTAINABILITY INDEX**



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Cover photo: A HDB residential compound in Singapore.
Credit: Paixin

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A residential area in Seoul.
Credit: Seoul Housing (SH)

Executive Summary

This report analyses housing attainability in 28 cities in five countries: Australia, China, Japan, Singapore, and South Korea. The cities include capitals, gateway cities, and satellite cities as well as regional centers.

Much like what is reported in the 2021 ULI Home Attainability Index for the United States, housing in the Asia Pacific region is least affordable in populous gateway cities such as Hong Kong SAR, Seoul, Tokyo, and Sydney. When comparing median home price to median household income, housing in Shenzhen (China) is deemed least affordable. During the past two decades, a limited supply of new housing in Shenzhen relative to the population increase during the same period has been a key cause of the city's housing challenge.

In the Asia Pacific region, Singapore stands out as the only city-state where housing is deemed affordable. The country's high homeownership rate of nearly 90 percent and the low cost of government housing units (known as HDB units) directly stem from the government's consistent commitment and policies to provide affordable and good-quality housing to its citizens.

Overall, for most of the cities in the study, the ratio of median home price to median annual household income is well over 5, which renders housing extremely unaffordable. For private rental housing, the rent-to-income ratio is highest in Hong Kong at 50 percent. However, when considering deeply subsidized public rental housing stock, which comprises about one-third of the total housing stock, Hong Kong's overall housing situation does not look as dire as implied by the ratios based on commercial housing price and rent data.

One important benefit of this study has been to aggregate and highlight key differences and similarities among the different cities and countries in the Asia Pacific region that has allowed a more granular understanding of each market's housing sector and housing affordability. Given significant differences in the nature of the housing stock (for example, the relative size of public housing stock and informal housing stock as well as the size and quality of typical homes for ownership and rent), it is challenging and perhaps unwise to rank the cities in terms of housing affordability.

Nonetheless, comparing relevant statistics and policies can provide useful insights into the causes of limited housing affordability and potential solutions. For example, analysis of a city's existing housing stock and land use may suggest the potential to further optimise land use and increase new housing stock; high sale transaction costs, coupled with limited carrying costs for homeownership, appear to slow the turnover of homes and result in high vacancy rates; also, low interest-rate mortgages and low downpayment requirements may unintentionally prop up housing prices, creating greater volatility in housing prices in the long run.

This inaugural study was guided by a group of housing experts in the region, and the data were collected with the help of volunteers and ULI colleagues. We are grateful for their contributions and we hope this report will serve as a catalyst and a useful reference for further discussion on how to improve housing attainability in the Asia Pacific region.



An endless line of high-rise residential apartments in suburban Hong Kong.
Credit: Ron Reiring

Introduction

Asia, which includes the world's two most populous countries, China and India, has a population of 4.7 billion, which represents approximately 60 percent of the world's population. During the past half century, much of Asia has undergone rapid economic growth that has been accompanied by unprecedented urbanization. Providing housing to newcomers and improving housing conditions for existing urban dwellers has been a key challenge for national and city governments in the region.

The essential need for housing—for a home—is shared universally. The Chinese character for safety or peacefulness, 安 (pronounced “aan”), consists of a house at the top and a woman at the bottom. From a traditional male perspective, having a house and a wife equates to a safe and peaceful life. In the United States, owning a house with a two-car garage symbolizes having gained middle-class status and fulfilling the American Dream.

For many families living in cities, housing-related expenses are the largest expense item. At the same time, for many homeowners, the value of their home represents much of their wealth. Yet, homeowners are vulnerable to losing a substantial portion of that wealth when they are unable to service their mortgage debt or when a housing market crash occurs, like the great financial crisis of 2007.

For non-homeowners, renting is the other main option to attain “home.” Renting can be a better option for young people who are more mobile for professional or other reasons and who often lack sufficient savings for a downpayment. High transaction costs associated with purchasing a home, such as a purchase tax and brokerage fees, also discourage people from buying homes.

Many families rent because they lack the financial means to pay the downpayment or to make monthly mortgage payments. High rent costs can prolong the time needed for renters to accumulate savings to purchase a home, and in high-cost cities, especially in gateway cities, many households, even middle- and upper-middle-class households, give up on owning a home all together.

Often, other societal problems are caused by or associated with high housing costs. Examples include young people who postpone marriage for many years because they cannot afford to buy a home and parents who risk their financial security by spending a big portion of their savings to help their children purchase a home.

For the study, we gathered relevant data on housing and household income for key cities in five countries in the Asia Pacific region and measured housing affordability for home purchase and rent. The key ratios for measuring housing affordability in this report are median home price to median household income and median monthly rent to median household income. In general, home price is considered severely unaffordable when median home price is more than five times median household income. For rental housing, monthly rent that is higher than 25 percent of monthly income is considered unaffordable.

This study was aided by volunteers who helped procure relevant local data and by an advisory committee consisting of academics and housing experts from the countries covered in the report. Interviews with members of the committee ensured the data were accurate and relevant. Moreover, the advisory committee provided valuable information and insights without which the whole exercise would have turned into something akin to touching different parts of an elephant while blindfolded and drawing conclusions that could paint wrong or incomplete pictures of the real situation.

The authors also acknowledge the support of a team of four students in the MSc in Business Analytics program at Hong Kong University of Science and Technology, led by Professor Joon Nak Choi. The team served as a valuable sounding board in analyzing data.

Before presenting the findings of the study, it is important to discuss the study's key limitations and challenges:

- Except for HDB units in Singapore, home price and rent for public housing units or informal housing units are not included in the calculated housing affordability ratios. This is significant especially for Hong Kong, where approximately 50 percent of the population live in subsidized public housing units where monthly rent falls below 10 percent of monthly income. Also, in Shenzhen, about 30 percent of the population live in informal housing units where home price is significantly below the “formal” housing price and monthly rent is below 10 percent of monthly income.
- When comparing affordability ratios using actual home price or rent versus median annual income or monthly income, the study does not consider differences in the size and quality of housing across the cities in the report. For example, Australians, in general, live in homes that are three to four times larger than homes in most other cities.

- When directly comparable data were not available, other related data were used and an educated adjustment was made. For example, for China, only average household income was available, therefore, using the available Gini coefficient, median household income, which is around 30 percent lower than average household income, was estimated. Also, for China, net floor areas were estimated based on available gross floor area and assuming an 80 percent efficiency rate. For some cities, only the average price of new “condo” or apartment units was available.

Despite the above challenges, this report highlights areas where significant housing affordability issues exist and key underlying causes of those issues as well as potential solutions. It is hoped this report will serve as a catalyst for bringing together interested housing experts, real estate development professionals, and the public sector to discuss ways to improve the housing situation in the Asia Pacific region.

FIGURE 1 Cities Included in the Report



TABLE 1 Key Supporting Data and Metrics

| City | Population | | Homeownership | | Median household income (annual) | | Household income growth 2016-2020 CAGR | Price-to-income ratio | | Per sq m housing price | | Actual median/average house size | | Actual median housing price per unit | | Rent-to-income ratio | Per sq m (usable area) monthly rent | | Actual median/average rental house size | | Actual median/average monthly rent | |
|-----------------|------------|------|---------------|---------|----------------------------------|---------|--|-----------------------|----------------|------------------------|-----------|----------------------------------|---------------------|--------------------------------------|------------|----------------------|-------------------------------------|-----------|---|---------------|------------------------------------|--|
| | 000 ppl | year | year | year | USD | year | | USD/sq m | year | sq m usable area | year | USD/unit | year | USD/sq m/month | year | | sq m usable area | year | USD/unit/month | year | | |
| Sydney | 5,361 | 2021 | 62.1% | 2017-18 | 77,313 | 2019/20 | 2.5% | 15.1 / 7.6 | 6,540 / 5,780 | 2021 | 178 / 101 | 2020 / 21 | 1,164,111 / 583,161 | 2021 | 29% / 24% | 13.3 / 19.2 | 2021 | 142 / 81 | 2020 / 21 | 1,895 / 1,548 | 2021 | |
| Melbourne | 5,096 | 2021 | 66.7% | 2017-18 | 73,101 | 2019/20 | 3.9% | 11.0 / 6.0 | 4,192 / 3,439 | 2021 | 191 / 125 | 2020 / 21 | 800,765 / 431,335 | 2021 | 23% / 19% | 9.2 / 11.8 | 2021 | 153 / 100 | 2020 / 21 | 1,406 / 1,184 | 2021 | |
| Brisbane | 2,582 | 2021 | 62.3% | 2017-18 | 65,291 | 2019/20 | 0.1% | 8.9 / 4.7 | 3,109 / 2,185 | 2021 | 185 / 113 | 2020 / 21 | 575,754 / 302,415 | 2021 | 28% / 24% | 10.2 / 14.7 | 2021 | 148 / 93 | 2020 / 21 | 1,516 / 1,327 | 2021 | |
| Shanghai | 24,894 | 2021 | 67.9% | 2012 | 20,718 | 2020 | 7.4% | 24.5 | 7,036 | 2020 | 72 | | 506,602 | 2020 | 38% | 15.0 | 2021 | 43 | | 1,079 | | |
| Beijing | 21,886 | 2021 | 70.7% | 2012 | 21,954 | 2020 | 7.2% | 26.8 | 8,174 | 2020 | 72 | | 588,546 | 2020 | 40% | 17.0 | 2021 | 43 | | 1,224 | | |
| Shenzhen | 17,682 | 2021 | 70.0% | 2012 | 19,268 | 2020 | 7.4% | 40.7 | 10,886 | 2020 | 72 | | 783,791 | 2020 | 41% | 15.1 | 2021 | 43 | | 1,086 | | |
| Guangzhou | 18,811 | 2021 | 72.8% | 2012 | 23,834 | 2020 | 7.6% | 15.7 | 5,192 | 2020 | 72 | | 373,833 | 2020 | 21% | 9.5 | 2021 | 43 | | 680 | | |
| Chongqing | 32,124 | 2021 | 80.2% | 2012 | 10,512 | 2020 | 8.8% | 11.7 | 1,708 | 2020 | 72 | | 122,952 | 2020 | 23% | 4.6 | 2021 | 43 | | 332 | | |
| Chengdu | 21,192 | 2021 | 73.6% | 2012 | 15,869 | 2020 | 10.4% | 11.5 | 2,534 | 2020 | 72 | | 182,435 | 2020 | 21% | 6.4 | 2021 | 43 | | 462 | | |
| Tianjin | 13,730 | 2021 | 79.4% | 2012 | 14,078 | 2020 | 6.5% | 16.1 | 3,139 | 2020 | 72 | | 226,007 | 2020 | 25% | 6.9 | 2021 | 43 | | 496 | | |
| Wuhan | 13,649 | 2021 | 78.0% | 2012 | 18,383 | 2020 | 6.5% | 11.0 | 2,810 | 2020 | 72 | | 202,304 | 2020 | 19% | 6.6 | 2021 | 43 | | 474 | | |
| Suzhou | 12,848 | 2021 | 81.6% | 2012 | 23,812 | 2020 | 7.7% | 9.6 | 3,181 | 2020 | 72 | | 229,045 | 2020 | 11% | 5.3 | 2021 | 43 | | 379 | | |
| Hangzhou | 12,204 | 2021 | 79.2% | 2012 | 16,840 | 2020 | 7.6% | 22.5 | 5,256 | 2020 | 72 | | 378,465 | 2020 | 34% | 11.1 | 2021 | 43 | | 798 | | |
| Nanjing | 9,423 | 2021 | 79.8% | 2012 | 20,059 | 2020 | 8.3% | 17.3 | 4,821 | 2020 | 72 | | 347,124 | 2020 | 21% | 8.1 | 2021 | 43 | | 583 | | |
| Hong Kong SAR | 7,403 | 2021 | 48.6% | 2021 | 41,176 | 2021 | 1.9% | 30.8 | 21,185 | 2021 | 50 | 2016 | 1,267,091 | 2021 | 50% | 43.0 | 2021 | 40 | 2016 | 1,720 | 2021 | |
| Tokyo (Ku Area) | 9,745 | 2020 | 41.7% | 2018 | 43,423 | 2019 | 3.8% | 16.6 | 11,141 | 2021 | 65 | 2021 | 720,704 | 2021 | 22% | 20.1 | 2018 | 40 | 2018 | 807 | 2018 | |
| Yokohama | 3,778 | 2020 | 59.2% | 2018 | 42,486 | 2019 | 2.0% | 15.4 | 8,986 | 2021 | 73 | 2018 | 655,978 | 2021 | 19% | 14.9 | 2018 | 44 | 2018 | 662 | 2018 | |
| Osaka | 2,755 | 2020 | 40.5% | 2018 | 31,694 | 2019 | 2.8% | 13.2 | 7,917 | 2021 | 53 | 2021 | 417,145 | 2021 | 20% | 13.6 | 2018 | 40 | 2018 | 538 | 2018 | |
| Fukuoka | 1,613 | 2020 | 36.8% | 2018 | 31,344 | 2019 | 1.0% | 5.5 | 2,731 | Apr, 2022 | 79 | 2018 | 172,072 | Apr, 2022 | 19% | 11.3 | 2018 | 44 | 2018 | 501 | 2018 | |
| Tachikawa | 187 | 2020 | 46.8% | 2018 | 37,657 | 2019 | n.a. | 10.1 | 5,607 | 2021 | 68 | 2018 | 381,276 | 2021 | 17% | 12.9 | 2018 | 42 | 2018 | 534 | 2018 | |
| Singapore | 5,454 | 2021 | 88.9% | 2021 | 84,735 | 2021 | 2.8% | 13.4 / 4.5 | 10,090 / 3,861 | 2021 | 112 / 98 | 2021 | 1,130,080 / 379,283 | 2021 | 29% / n.a. | 28.41 / n.a. | 2021 | 72 / n.a. | | 2,046 / n.a. | | |
| Seoul | 9,586 | 2020 | 48.4% | 2020 | 33,053 | 2020 | 3.1% | 18.6 | 8,337 | 2021 | 74 | 2021 | 615,798 | 2021 | 27% | 15.2 | 2021 | 49 | 2020 | 748 | 2021 | |
| Busan | 3,349 | 2020 | 57.6% | 2020 | 28,006 | 2020 | 3.9% | 8.4 | 3,083 | 2021 | 76 | 2021 | 235,639 | 2021 | 18% | 7.6 | 2021 | 55 | 2020 | 420 | 2021 | |
| Incheon | 2,945 | 2020 | 57.5% | 2020 | 28,858 | 2020 | 4.0% | 8.8 | 3,397 | 2021 | 75 | 2021 | 254,087 | 2021 | 24% | 10.5 | 2021 | 54 | 2020 | 568 | 2021 | |
| Daegu | 2,411 | 2020 | 57.8% | 2020 | 28,793 | 2020 | 3.0% | 8.9 | 3,003 | 2021 | 86 | 2021 | 257,644 | 2021 | 24% | 9.7 | 2021 | 59 | 2020 | 569 | 2021 | |
| Daejeon | 1,488 | 2020 | 52.4% | 2020 | 29,331 | 2020 | 3.3% | 8.9 | 2,973 | 2021 | 87 | 2021 | 259,740 | 2021 | 20% | 8.8 | 2021 | 55 | 2020 | 483 | 2021 | |
| Gwangju | 1,478 | 2020 | 57.4% | 2020 | 30,512 | 2020 | 3.9% | 6.0 | 2,215 | 2021 | 82 | 2021 | 181,720 | 2021 | 17% | 7.3 | 2021 | 58 | 2020 | 425 | 2021 | |
| Ulsan | 1,135 | 2020 | 64.4% | 2020 | 33,771 | 2020 | 2.4% | 6.8 | 2,627 | 2021 | 87 | 2021 | 229,621 | 2021 | 17% | 7.5 | 2021 | 62 | 2020 | 466 | 2021 | |

calculated results assumption Australia (house/apartment) Singapore (private/HDB flat)

Note: 000 ppl = thousands of people; CAGR = compound annual growth rate; n.a. = not available.

ULI Terwilliger Center 2021 Home Attainability Index report: methodology and key conclusions

The ULI Asia Pacific Home Attainability Index report is initially based on *Terwilliger Center 2021 Home Attainability Index* report for the United States, which provides a data-informed foundation for regional discussions of housing needs and solutions for 112 metropolitan statistical areas in the United States. The Index provides a high-level snapshot of housing attainability and associated issues for the U.S. market. The key conclusions of the report are as follows:

- The most severe cost burdens among middle-income households are predominantly found in the most populous regions.

- However, a nationwide lack of attainable homes for many members of the workforce is not limited to the most vibrant U.S. metropolitan economies.
- In particular, across the country, lower-income households are struggling to find attainable rental units.
- Segregation—both by income and race—cuts across market types and geographies, and high housing costs threaten to worsen racial and socioeconomic disparities.

It is noted that the data for the report were collected before the start of the COVID-19 pandemic in 2020, and as housing prices and rents have substantially increased in the past two years, the housing attainability situation in the United States has deteriorated considerably.



ULI TERWILLIGER CENTER 2021 HOME ATTAINABILITY INDEX



Summary Report

Credit: ULI

Home Affordability Analysis

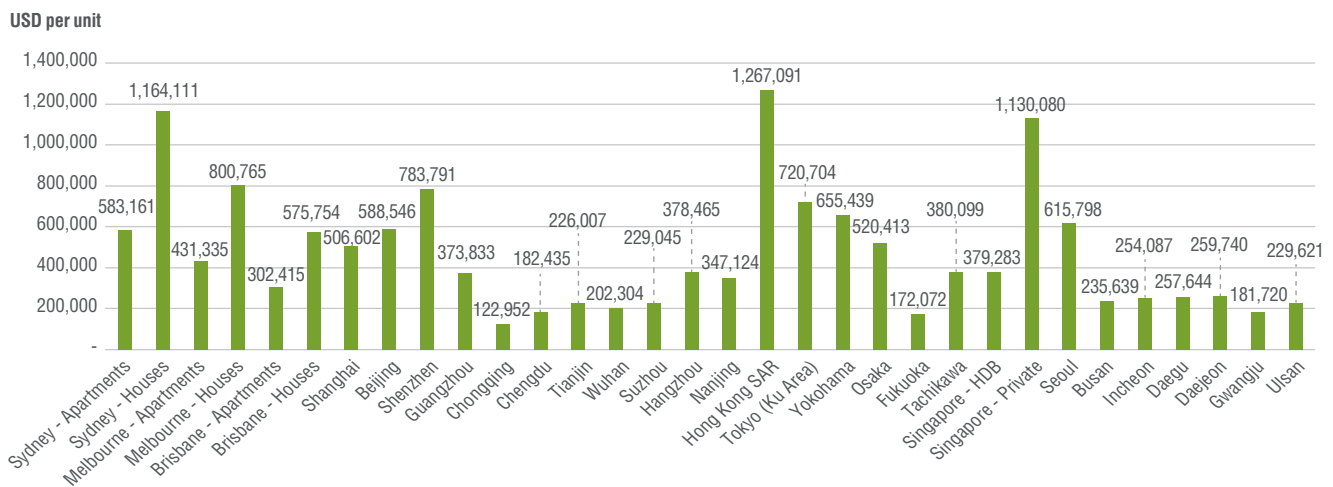
Home affordability is mainly measured by 1) the ratio of the median home price to median annual household income, and 2) the ratio of the median monthly rent to median monthly household income. With the exception of Singapore’s HDB units, only private-sector housing stock data are used for the analysis. As explained later, some cities, like Hong Kong and Shenzhen, have a substantial amount of public rental housing stock and residential buildings without property titles, respectively, that are not included in the calculations of the ratios.

price is only for private-sector homes that represent about 50 percent of the total housing stock. In Singapore, private homes with a median price of US\$1.13 million represent less than 20 percent of the city-state’s total housing stock. In figure 2, for Sydney, Melbourne, and Brisbane, Australia, median prices of single-family homes and apartment units are shown separately. For Tokyo-Ku, which represents the urban core of the city, and Osaka, Japan, the average price of new “condos” (meaning high-rise apartments) is shown, and for the remaining Japanese cities, average prices of primary and resale condo sales are shown.

Home price comparison

With a median home price of US\$1.27 million, Hong Kong is the most expensive city in the Asia Pacific region (see figure 2). It should be highlighted that Hong Kong’s median home

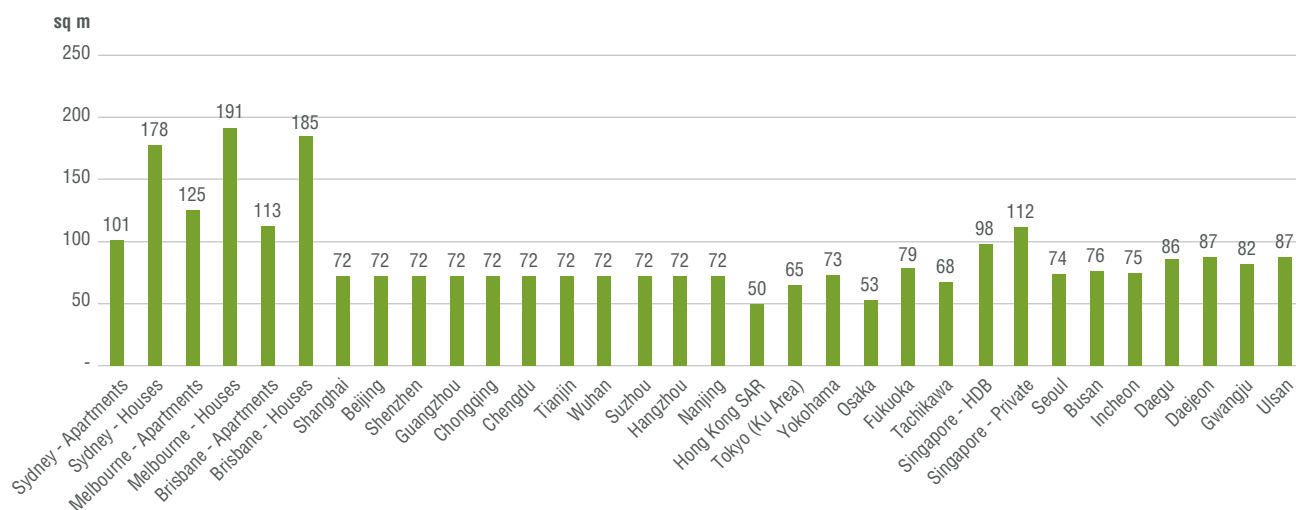
FIGURE 2 Median/Average Housing Price per Unit



Notes:

1. Median housing price per unit for both primary and resale residential properties in Australian cities, 2021 data
2. Average housing price per sqm times 72 sqm for primary sales for 11 mainland Chinese cities, 2020 data
3. Median housing prices per unit for private resales in Singapore (Urban Redevelopment Authority), 2021 data
4. Average housing price per unit for both primary and resale residential properties in Hong Kong, 2021 data
5. Average housing price per unit for new condos in Tokyo (Ku Area) and Osaka, 2021; average housing price per sqm for both primary and resale condos in Tachikawa, Yokohama, 2021 data (times average apartment size of existing housing stock); median resale condo price per unit for Fukuoka, April 2022 data
6. Average housing prices per unit for HDB resale flats in Singapore, 2021 data
7. Median housing price per unit for private sales in South Korean cities, 2021 data

FIGURE 3 Median/Average Home Size, Owner-Occupied



Notes:

1. We assume the average home size for Chinese cities is 72 sqm usable area (90 sqm gross floor area times 80% floor efficiency) given a) urban per capita living space stood at 36.6 sqm gross floor area in 2016, according to the National Bureau of Statistics (NBS), b) the average household size for the covered 11 mainland Chinese cities is 2.8 in 2020, and c) the State Council requires that no less than 70% of the newly built private housing units be no larger than 90 sqm gross floor area
2. We assume the average home sizes in Sydney, Melbourne and Brisbane are 80% of the average sizes of newly built houses and apartments (2020/21) in New South Wales, Victoria and Queensland (CommSec home size report 2021)
3. For Hong Kong, 2016 median home size of private owner-occupier housing
4. For Tokyo (Ku Area) and Osaka, average home size from new condo transactions, 2021; for Yokohama, Fukuoka and Tachikawa, average owner-occupier home size (apartments) data from 2018 Housing and Land Survey
5. For other cities, median home size data from actual transactions

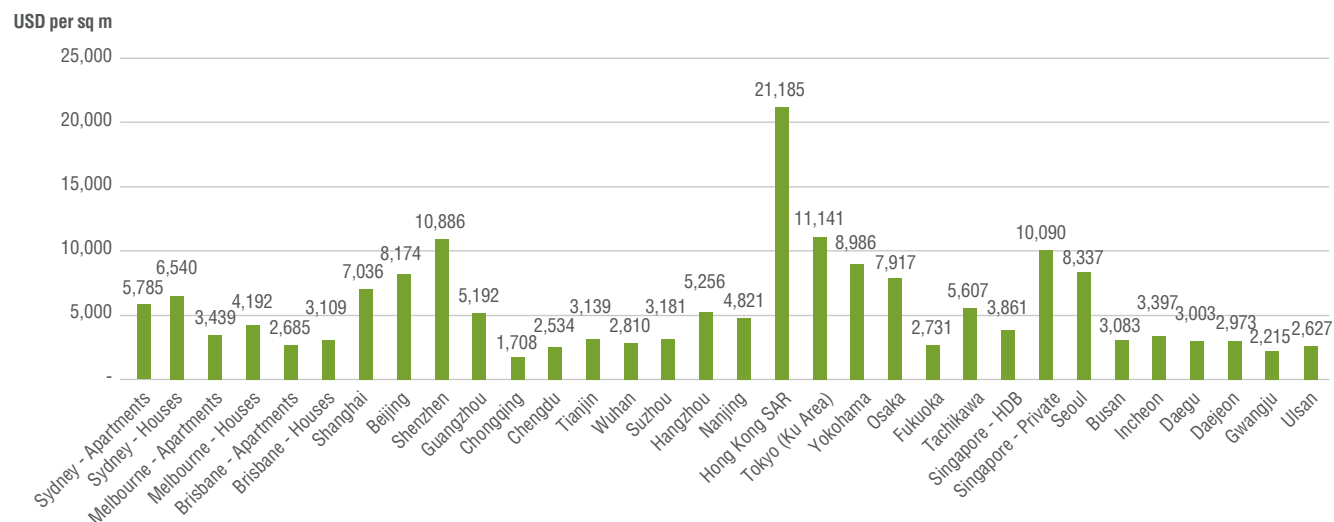
The median price of Singapore’s public housing units (HDB units) is only US\$380,000, on par with the median prices found in many second-tier cities in China and Tachikawa, a satellite city of Tokyo.

For the three Australian cities in the report, the median price of single-family homes is nearly double that of apartment unit prices. Much of the price difference is explained by a significant size difference between the two types of homes. In general, single-family homes are about 70 percent larger than apartment units. Still, on a per square metre basis, single-family homes are materially more expensive than apartment units.

In Korea, Seoul is clearly the most expensive city, with a median home price of approximately US\$616,000; home prices in the other cities are between US\$200,000 and US\$260,000—lower than most second-tier cities in China.

In Japan, Tokyo-Ku has the highest average price at US\$721,000 for new condos, followed by nearby Yokohama at US\$655,000 for new and resale condos and Osaka at US\$520,000 for new condos. Tachikawa, a satellite city of Tokyo, has an average price of US\$380,000 for new and resale condos, which is roughly half the price of condos in Tokyo-Ku. Fukuoka is the least expensive of the five Japanese cities in the study, with a median resale condo price of US\$172,000.

FIGURE 4 Median/Average Housing Price per Square Metre Usable Area



Notes:

1. Median housing price per unit divided by estimated home size for both primary and resale residential properties in Australian cities, 2021 data
2. Average housing price per sqm for primary sales for 11 mainland Chinese cities, 2020 data
3. NBS does not release the average housing price for Suzhou. We derived the pricing data by multiplying Suzhou's housing price number provided by CRTYPE DATA (an affiliation of China Real Estate Association) with the average percentage difference between the NBS and the CRTYPE DATA pricing data for the other 11 mainland Chinese cities
4. Median housing prices per sqm for private resales in Singapore (Urban Redevelopment Authority), 2021 data
5. Weighted average housing price per sqm based on housing price by district and home size and total housing stock in Hong Kong, 2021 data
6. Average housing price per sqm for both primary condos in Tokyo (Ku Area), Tachikawa, Yokohama and Osaka, 2021 data; median resale condo price per sqm for Fukuoka, April 2022 data
7. Average housing prices per sqm for HDB resale flats in Singapore, 2021 data
8. Median housing price per sqm for private sales in South Korean cities, 2021 data

As seen in figure 3, a wide variance exists among the cities in terms of home size. Hong Kong has the smallest median home size at 50 square metres. On a per square metre of usable floor basis, Hong Kong has the highest at US\$21,200, followed by Tokyo-Ku at US\$11,100 (see figure 4). The third highest is Shenzhen at US\$10,900 per square metre, followed by Singapore's private homes at US\$10,100. Overall, Korea's

regional cities have some of the lowest average prices per square metre at about US\$3,000, followed by China's second-tier cities and Australia's cities. Singapore's HDB units have an average price of US\$3,900 per square metre, the lowest of the gateway cities in the region, which is approximately one-half of Beijing and Shanghai's at US\$8,200 and US\$7,000, respectively.

Home price affordability

Shenzhen has the highest ratio of median home price to annual household income of all cities in the report. At 40.7, Shenzhen's price-to-income ratio is substantially higher than Hong Kong's 30.8, Beijing's 26.8, and Shanghai's 24.5 (see figure 5). A review of housing and demographic statistics easily explains why Shenzhen, a city of 17 million, has a

significant housing problem. As shown in table 2, although its population grew by 7 million between 2010 and 2020, Shenzhen's new housing stock only increased 26.8 million square metres, or 3.7 square metres per new resident, the lowest among the Chinese cities in the report. In comparison, during the same period, Shanghai added 174 million square metres of housing while its population grew less than 2 million.

FIGURE 5 Median/Average Home Price-to-Median Annual Household Income Ratios

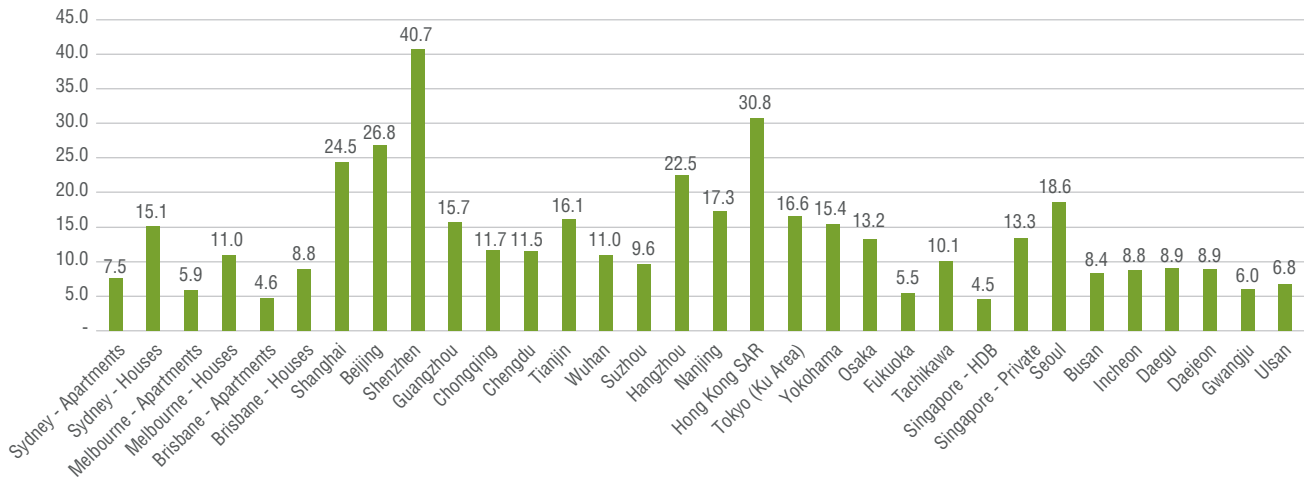


TABLE 2 New Housing Supply and Population Increase for Cities in China

| City | 2020 permanent residents | 2002-2020 new housing completion | | Urban permanent | Urbanization rate | 2010-2020 population increase | 2010-2020 new housing completion | |
|-----------|--------------------------|----------------------------------|-------------------|-----------------|-------------------|-------------------------------|----------------------------------|-------------------|
| | (mm ppl) | Total GFA (mm sq m) | Per capita (sq m) | | | (mm ppl) | Total GFA (mm sq m) | Per capita (sq m) |
| Beijing | 21.9 | 293.8 | 13.4 | 19.16 | 87.5% | 2.3 | 131.3 | 6.0 |
| Tianjin | 13.9 | 286.7 | 20.7 | 11.74 | 84.7% | 0.9 | 191.8 | 13.8 |
| Shanghai | 24.9 | 358.3 | 14.4 | 22.21 | 89.3% | 1.9 | 174.0 | 7.0 |
| Nanjing | 9.3 | 153.8 | 16.5 | 8.09 | 86.8% | 1.3 | 101.6 | 10.9 |
| Hangzhou | 11.9 | 152.0 | 12.7 | 9.94 | 83.3% | 3.2 | 101.8 | 8.5 |
| Wuhan | 12.4 | 126.6 | 10.2 | 10.39 | 83.5% | 2.7 | 70.2 | 5.6 |
| Guangzhou | 18.7 | 167.5 | 8.9 | 16.26 | 86.8% | 6.0 | 104.2 | 5.6 |
| Shenzhen | 17.6 | 71.6 | 4.1 | 17.55 | 99.5% | 7.2 | 26.8 | 1.5 |
| Chongqing | 32.1 | 453.6 | 14.1 | 22.29 | 69.5% | 3.2 | 323.9 | 10.1 |
| Chengdu | 20.9 | 206.8 | 9.9 | 16.65 | 79.5% | 5.8 | 133.7 | 6.4 |

Source: National Bureau of Statistics, China.
Note: mm ppl = million people.

One important caveat, however, is that Shenzhen has a sizeable “informal” housing market (that is, urban villages with homes that lack legal titles). According to available research reports and government statistics, Shenzhen's informal housing stock may represent nearly 50 percent of total housing stock (see table 3). As a comparison, informal housing is estimated to represent only 5 percent in Shanghai. Moreover, in Shenzhen, the informal housing stock for purchase and rent is priced among the lowest in Chinese cities.

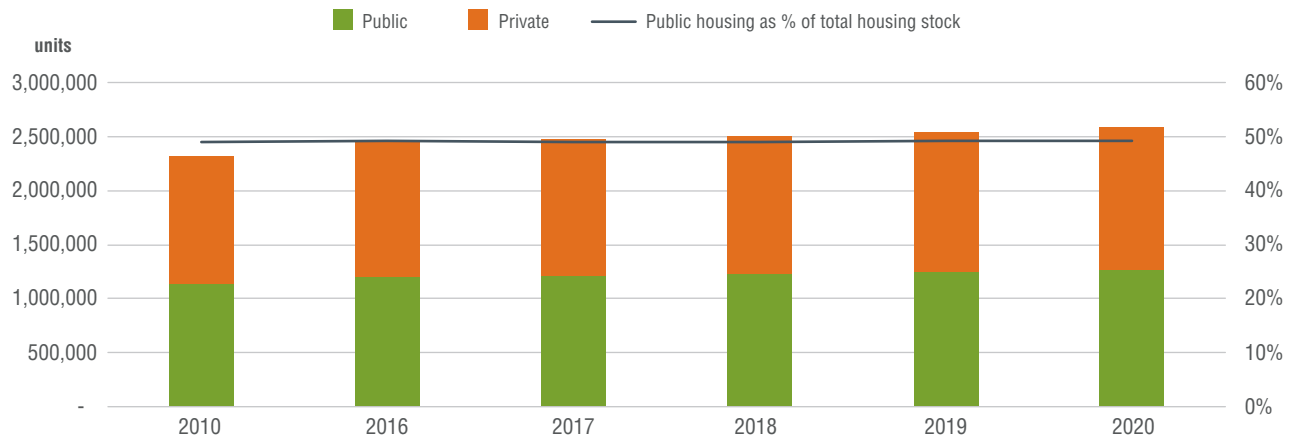
TABLE 3 Illegal Buildings in Shenzhen (2010)

| | Number of Buildings | Total Floor Area |
|--------------------------------|---------------------|------------------|
| Illegal Buildings | 356,852 | 392 million |
| All Buildings | 620,800 | 824 million |
| Illegal Buildings (% of total) | 57.49 | 47.57 |

Source: Shenzhen Municipal Government Report 11 (2010); Qiao, Shitong. "Planting Houses in Shenzhen: A Real Estate Market without Legal Titles," *Canadian Journal of Law and Society* 2013 (https://www.law.nyu.edu/sites/default/files/upload_documents/Qiao-Planting%20Houses%20in%20Shenzhen.pdf).

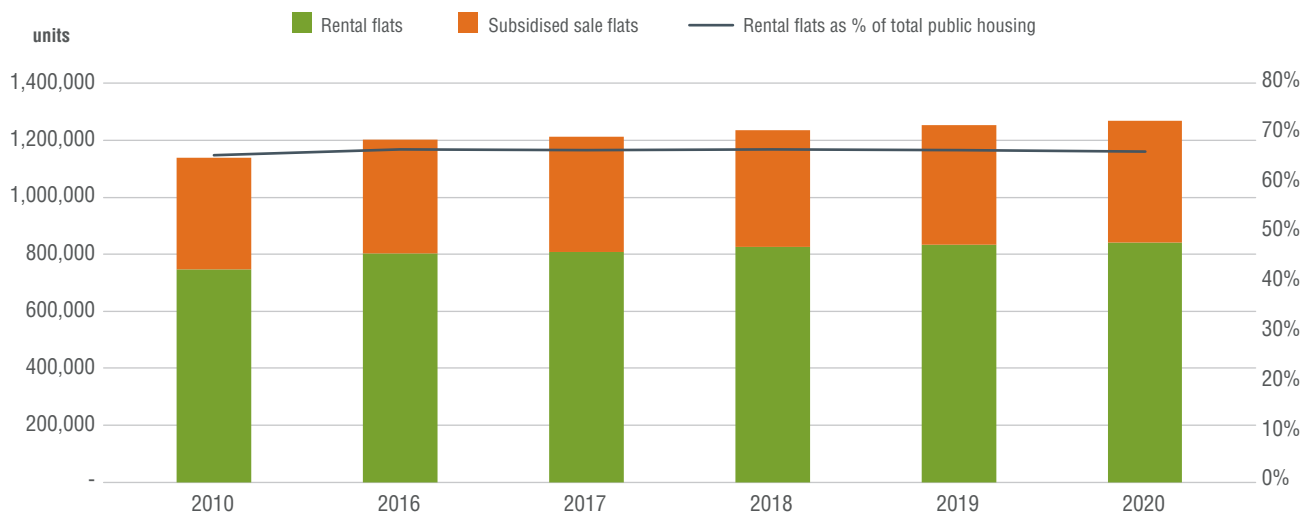
Hong Kong's high price-to-income ratio is not surprising given the city's reputation for being the world's most expensive city to live in. Yet, about 50 percent of Hong Kong's residents live in deeply subsidized housing units (see figure 6), and for public rental units that make up nearly 70 percent of the public housing stock (see figure 7), monthly rents represent approximately 10 percent of those residents' monthly income (see table 4).

FIGURE 6 Hong Kong Housing Stock Breakdown



Source: Census and Statistics Department, Hong Kong SAR.

FIGURE 7 Hong Kong Public Housing Stock Breakdown



Source: Census and Statistics Department, Hong Kong SAR.

TABLE 4 Hong Kong Public Rental Housing Rent and Rent-to-Income Ratio

| Public Rental Housing (PRH) | 2007 | 2019 | % increase |
|--|--------|--------|------------|
| Average PRH rent (HKD per month) | 1,319 | 2,272 | 72% |
| Average PRH household income (HKD per month) | 13,233 | 24,194 | 83% |
| Rent to income | 10.0% | 9.4% | |

Source: Census and Statistics Department, Hong Kong SAR.

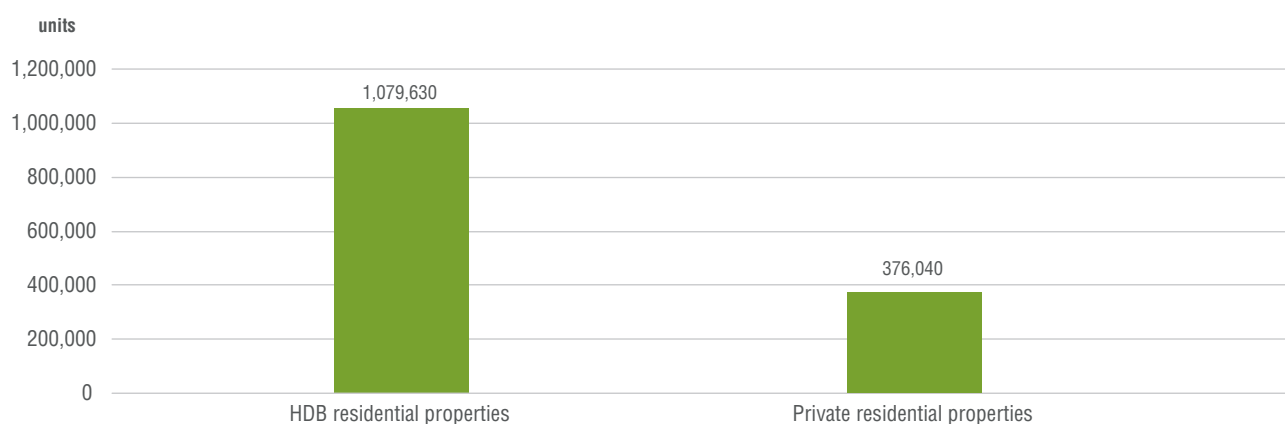
Behind Shenzhen, Hong Kong, Beijing, and Shanghai, Seoul has a median home price-to-income ratio of 18.6. Seoul's high ratio is due to a rapid increase in home prices during the past several years. Seoul is followed by Tokyo-Ku with a ratio of 16.6.

For the cities in China, Suzhou has the lowest ratio at 9.6, which is considerably lower than Shanghai and the other second-tier cities in China. Adjacent and connected to Shanghai by both subway and high-speed railway, Suzhou has seen a growth in the number of residents commuting to work in Shanghai, although this trend is on pause due to COVID-induced travel restrictions.

For Korea, the price-to-income ratio is between 7 and 9, which is lower than most cities in the study (Seoul's price-to-income ratio of 18 is the exception).

For Australia, Sydney is the least affordable, where median single-family home price is 15 times median household income. In comparison, median apartment unit price is 7.5 times median household income. In Australia, average single-family home size is nearly 200 square metres, which is three to four times larger than the average for many of the cities in the study.

In the study, housing in Singapore is the most affordable, with a price-to-income ratio of 4.5 for HDB units. As mentioned earlier in the report, more than 80 percent of Singaporeans live in HDB units (figure 8). Although the price-to-income ratio for private homes is high at 13.3, private homes represent less than 20 percent of all housing stock and cater to wealthy Singaporeans and foreigners. So, for those owning private homes, the price-to-income ratio should be substantially lower than 13.3, which is based on the median household income of the country.

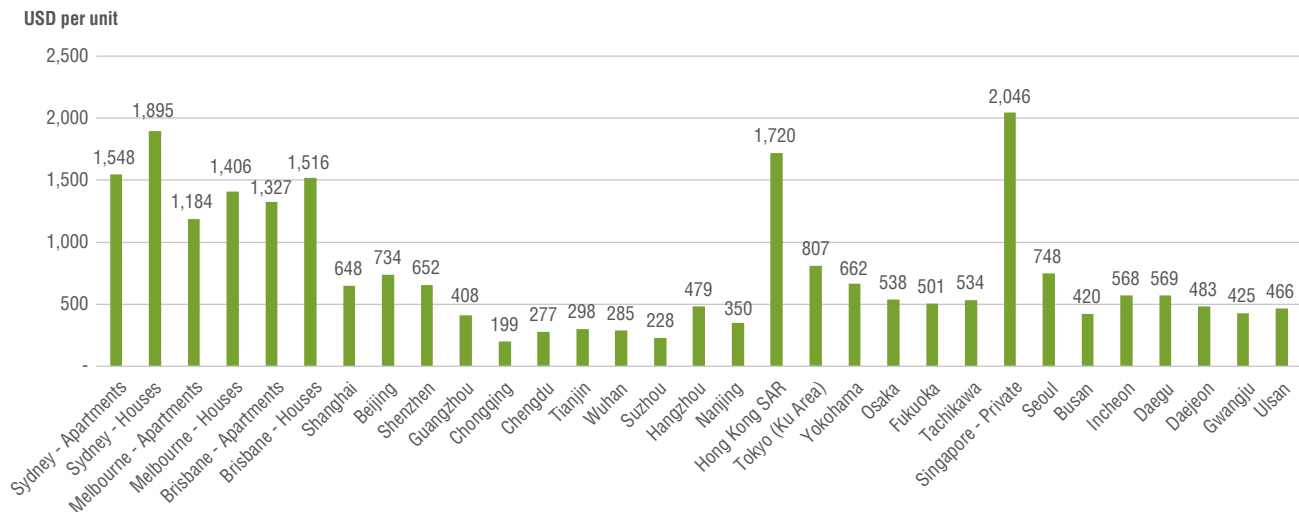
FIGURE 8 Singapore Housing Stock Breakdown (2020)

Source: Department of Statistics, Singapore; Housing and Development Board, Singapore; Urban Redevelopment Authority, Singapore.

Rental housing

In terms of rent cost, the most expensive is Singapore's non-HDB units at a median monthly rent of US\$2,000, followed by a median monthly rent of US\$1,800 for single-family homes in Sydney and other Australian cities (see figure 9). Median monthly rents for apartments in the three Australian cities range from US\$1,200 to US\$1,400 and are about 20 to 30 percent lower than rent for single-family homes. As a comparison, for owned units, apartments are priced at about 50 percent of single-family homes (see figure 2).

FIGURE 9 Median/Average Monthly Rent per Unit



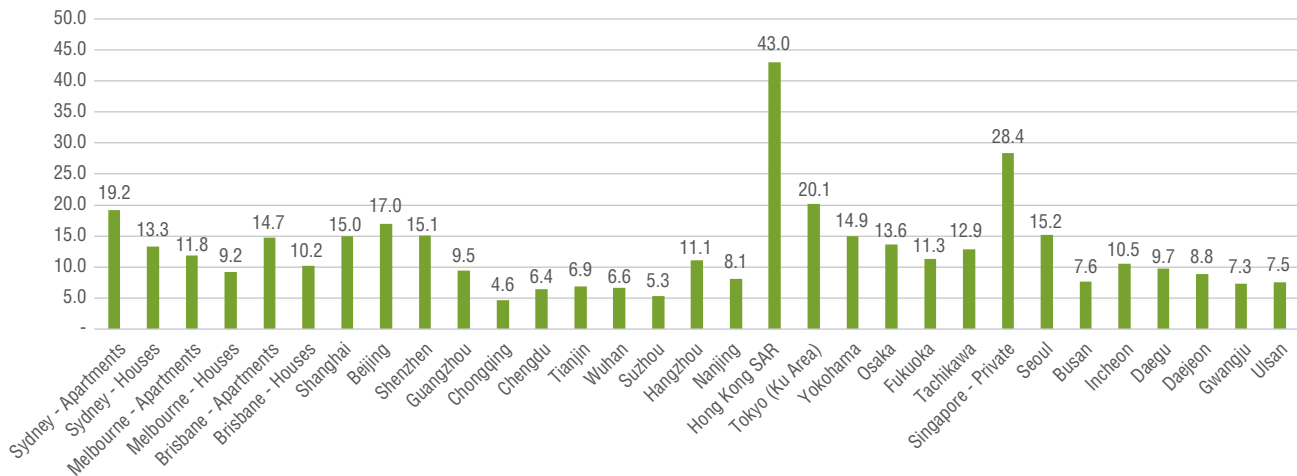
Notes:

1. Median monthly rent per unit for Australian cities, 2021 data
2. Average monthly rent in Chinese cities, 2021 data provided by CRTYRE DATA
3. Average monthly rent per unit for Hong Kong, 2021 data
4. Average monthly rent per unit for Japanese cities, 2018 Housing and Land Survey
5. Median monthly rent for two-bedroom private rental apartments in Singapore (Urban Redevelopment Authority), 2021 data
6. HDB releases rental flat fee arrangements for two low income categories (monthly rent arranging from USD 18-195 for monthly household income below USD 570 and 570-1,070 SGD), based on the rates, monthly HDB flat rents account for 4-11% of eligible low-income households' monthly income, 2021 data
7. Median monthly rent (Wolsei) per unit for South Korean cities , 2021 data; renters have to put up a heavy deposit, in the case of Seoul, the median Wolsei deposit was USD 69,553 in 2021

Although Hong Kong's median monthly rent is US\$1,700, which is below Singapore's rent for non-HDB units and Sydney's rent for single-family homes, Hong Kong has the most expensive monthly rent per square metre at US\$43, followed by Singapore's US\$28.40 per square metre for non-HDB units (see figure 10). Hong Kong's rental homes have an average size of 40 square metres, compared to 72 square

metres for rental units in Singapore (see figure 12). Tokyo-Ku and Sydney follow with monthly rent of US\$20.10 per square metre and US\$19.20 per square metre, respectively. Among the cities in China, Beijing has the highest monthly rent per square metre at US\$17, followed by Shenzhen and Shanghai at about US\$15 per square metre.

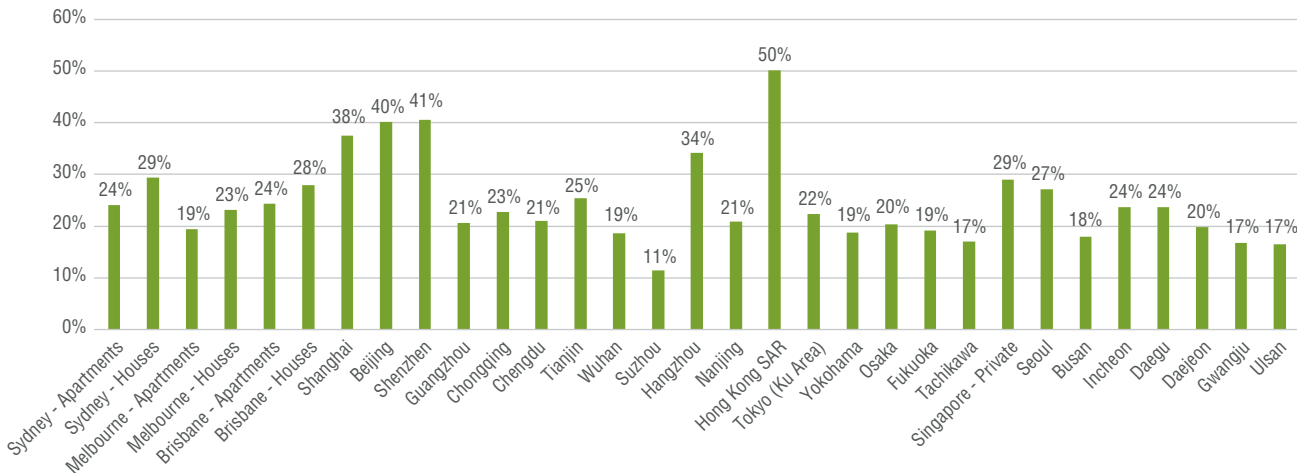
FIGURE 10 Median/Average Monthly Rent per Square Metre Usable Area



Notes :

1. Median monthly rent per unit divided by estimated home size of private rental housing in Australian cities, 2021 data
2. Average monthly rent in Chinese cities, 2021 data provided by CRTYRE DATA
3. Average monthly rent per unit divided by 2016 median home size of private rental housing stock in Hong Kong, 2021 data
4. Average monthly rent per unit divided by average home size of rental housing in Japanese cities, 2018 Housing and Land Survey
5. Median monthly rent for two-bedroom private rental apartments in Singapore (Urban Redevelopment Authority), 2021 data
6. HDB releases rental flat fee arrangements for two low income categories (monthly rent arranging from USD 18-195 for monthly household income below USD 570 and 570-1,070 SGD), based on the rates, monthly HDB flat rents account for 4-11% of eligible low-income households' monthly income, 2021 data
7. Median monthly rent per unit divided by estimated average home size of rental housing in South Korean cities, 2021 data

FIGURE 11 Monthly Rent-to-Median Monthly Household Income Ratios

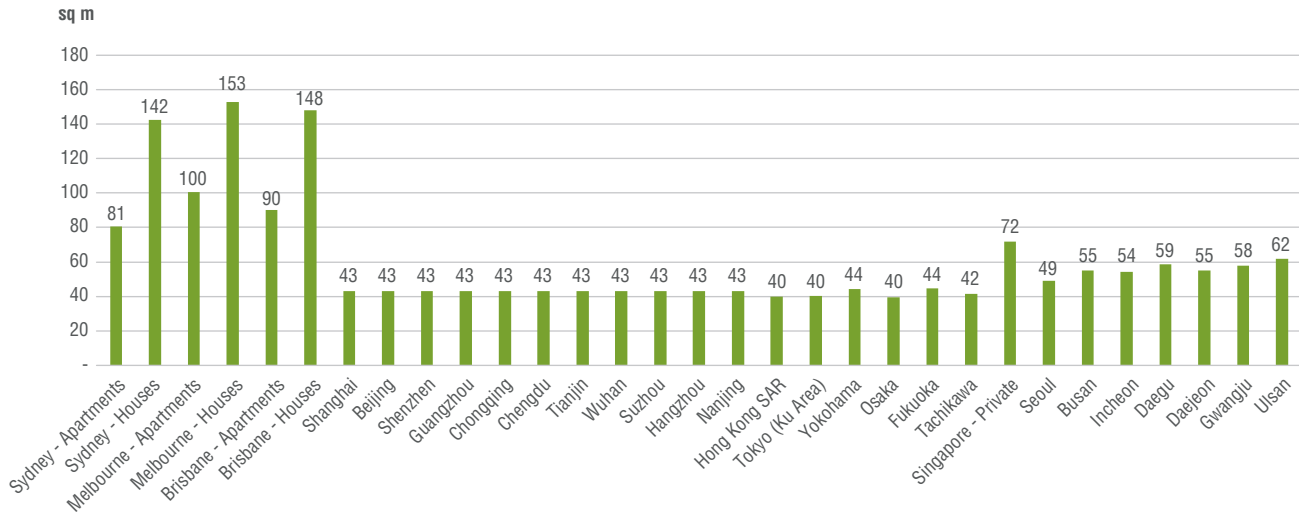


Notes:

1. We assume rental house and apartment sizes in Australian cities are 80% of owner-occupier home size
2. We assume the median rental housing size for Chinese cities is 43.2 sqm usable area, or 60% of 72 sqm usable area of owner-occupier home size
3. In Hong Kong, the average public rental housing (PRH) rent to the average PRH household income stood at only 9.4% in 2019, a strong contrast with the private rental sector
4. HDB releases rental flat fee arrangements for two low income categories (monthly rent arranging from USD 18-195 for monthly household income below USD 570 and 570-1,070 SGD), based on the rates, monthly HDB flat rents account for 4-11% of eligible low-income households' monthly income, 2021 data
5. We assume rental housing size in South Korean cities are 80% of the average residential area per household

In terms of private rental housing, Hong Kong is the most expensive city in which to rent, with monthly rent representing approximately 50 percent of median household income. Shenzhen, Beijing, and Shanghai follow with rent-to-income ratios of approximately 40 percent.

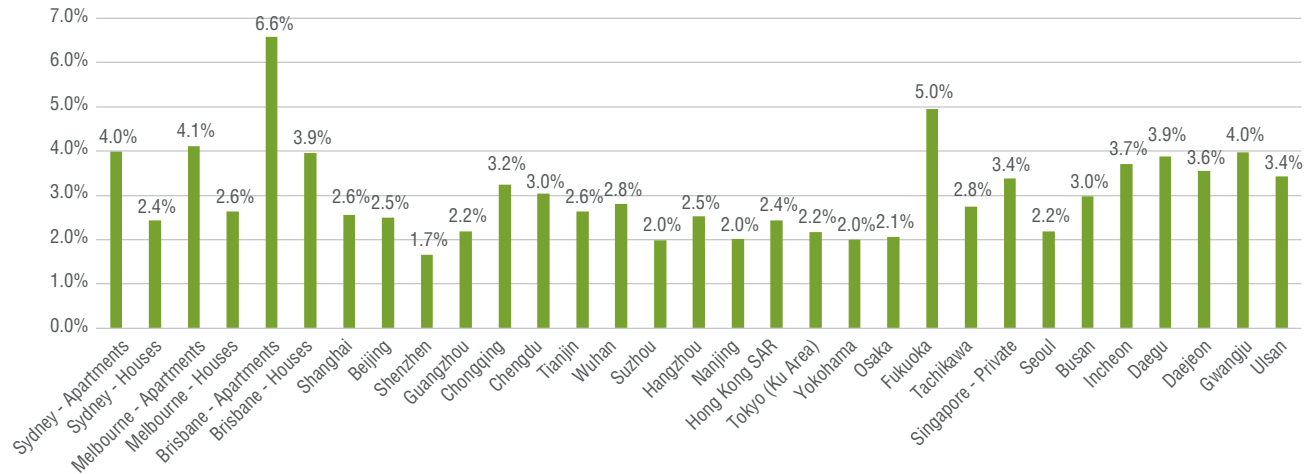
FIGURE 12 Median/Average Home Size, Rental



Notes:

1. We assume rental house and apartment sizes in Australian cities are 80% of owner-occupier home size
2. We assume the median rental housing size for Chinese cities is 43.2 sqm usable area, or 60% of 72 sqm usable area of owner-occupier home size
3. For Hong Kong, 2016 median home size of private rental housing
4. Rental housing size data in Japanese cities are from 2018 Land and Housing Survey
5. HDB rental flat size is not available
6. We assume rental housing size in South Korean cities are 80% of the average residential area per household

FIGURE 13 Implied Housing Yield—Annual Rent to Home Purchase Price

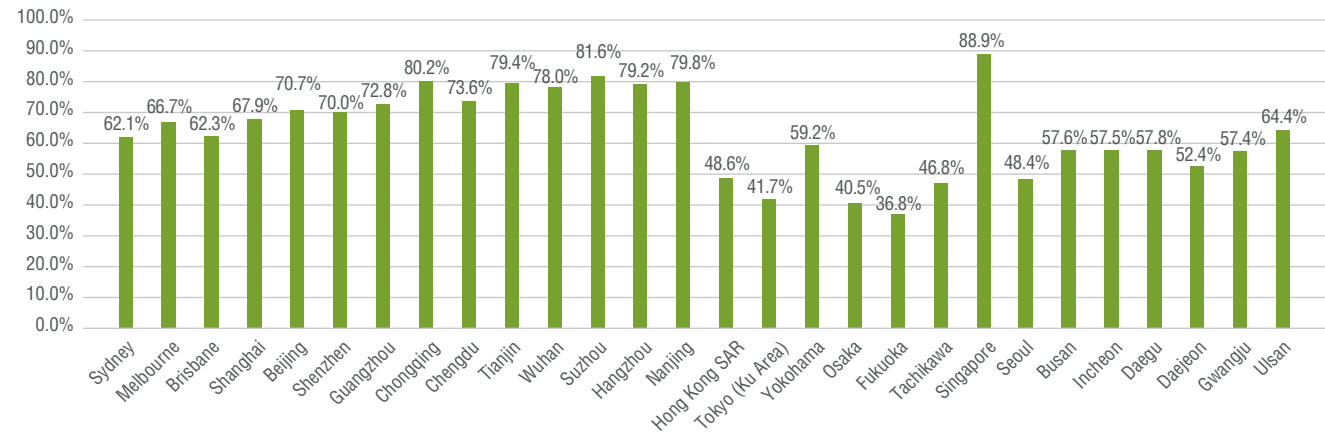


A combination of high home prices and relatively affordable rent means that rent yields, in general, are low. Yield is lowest in Shenzhen at 1.7 percent (see figure 13). Most other cities have yields ranging from 2 percent to 4 percent. Apartment units in Brisbane have the highest yield at 6.6 percent, followed by units in Fukuoka at 5 percent and apartment units in Melbourne at 4.1 percent.

Homeownership

Homeownership varies significantly across the region. Singapore has the highest homeownership rate (nearly 90 percent), followed by Chinese cities with rates ranging from 70 to 80 percent (see figure 14). Australian cities have a homeownership rate of about 65 percent. In Korea, Seoul has the lowest homeownership rate at 48 percent; the other Korean cities in the study have homeownership rates of about 55 to 65 percent.

FIGURE 14 Homeownership Rates



Notes:

1. Data for Sydney, Melbourne and Brisbane are for 2017-2018
2. The homeownership data for cities in mainland China are from a joint survey conducted by Tsinghua University and Zhejiang University in 2012. The People's Bank of China released a report in 2019 stating that homeownership in China reached 96%
3. Data for cities in Japan are for 2018 and calculated as ratios between the number of owner-occupied houses and the total number of houses in each city
4. Data for Singapore and Hong Kong are for 2021
5. Data for cities in South Korea are for 2020

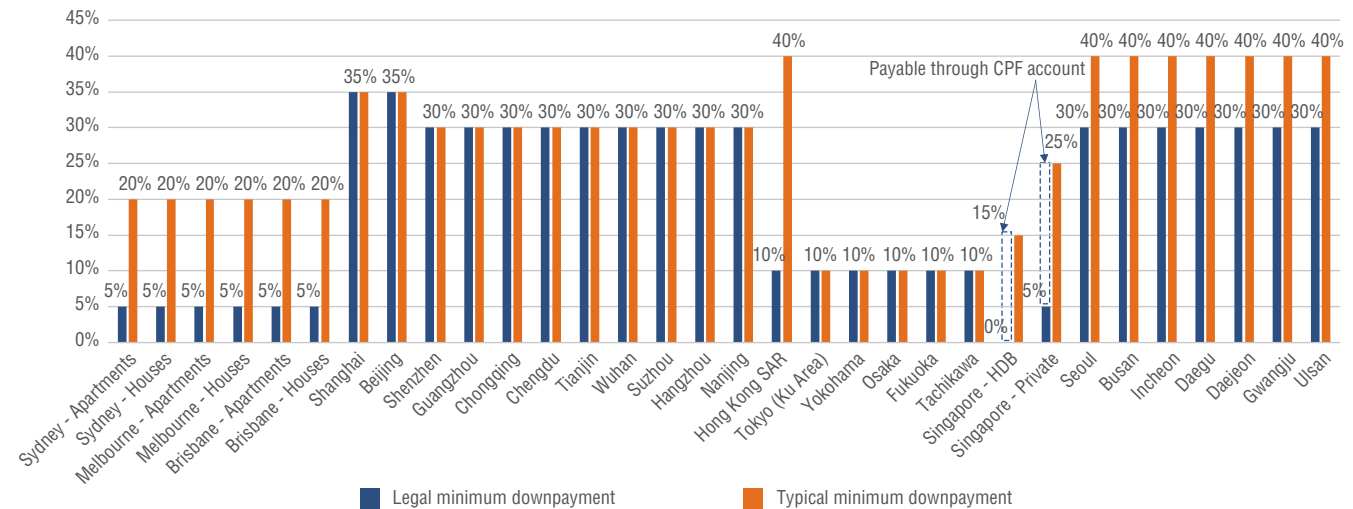
Overall, Japan has the lowest homeownership rate. Of the Japanese cities in the study, Fukuoka has the lowest homeownership rate of 37 percent despite a median home price of less than US\$170,000 and price-to-income ratio of 6. Osaka has the second lowest homeownership rate at 40.5 percent, followed by Tokyo at 41.7 percent. Yokohama stands out with a significantly higher homeownership rate of 59.2 percent.

Hong Kong's homeownership rate is at 48.6 percent, on par with Seoul's rate of 48.4 percent.

Ease of home purchase

For most people, mortgage financing is necessary when it comes to buying a home. Across the countries in the region, there are substantial differences in key terms and conditions for mortgage financing. The required minimum downpayment can be as low as 10 percent in Japan and as high as 35 percent in Beijing and Shanghai and in Seoul and the other Korean cities in the report (see figure 15). High downpayment ratios in China and Korea reflect the governments' policy goal of preventing home prices from rising.

FIGURE 15 Minimum Downpayment Requirement as Percentage of Home Purchase Price



Notes:

1. In Australia, home buyers can borrow as much as 95% of the home value. In the case that LTV is north of 80%, buyers are required to purchase the lenders mortgage insurance. In addition, local governments provided government-backed mortgage guarantees to bring forward homeownership access for young adults with moderate incomes but low savings. The low-deposit mortgage schemes enhance affordability through the avoidance of expensive lenders mortgage insurance
2. In Hong Kong, though the government requires 40% downpayment, first home buyers are allowed to borrow extra through the mortgage insurance program, up to 90%
3. In Japan, per the guidance of the government, the minimum downpayment is 10% of purchase price, however, commercial lenders are able to accommodate with 5% and even lower downpayment
4. In Singapore, buyers purchasing private housing units are required to put down 25% downpayment, in which at least 5% in cash and the rest 20% out of their Central Provident Fund (CPF) account
5. HDB flat buyers are required to put down 15% downpayment, which can be paid in full through their CPF account

High downpayment requirements coupled with high home prices mean that first-time buyers in their 20s and 30s with insufficient savings will need substantial financial help from parents or other family members.

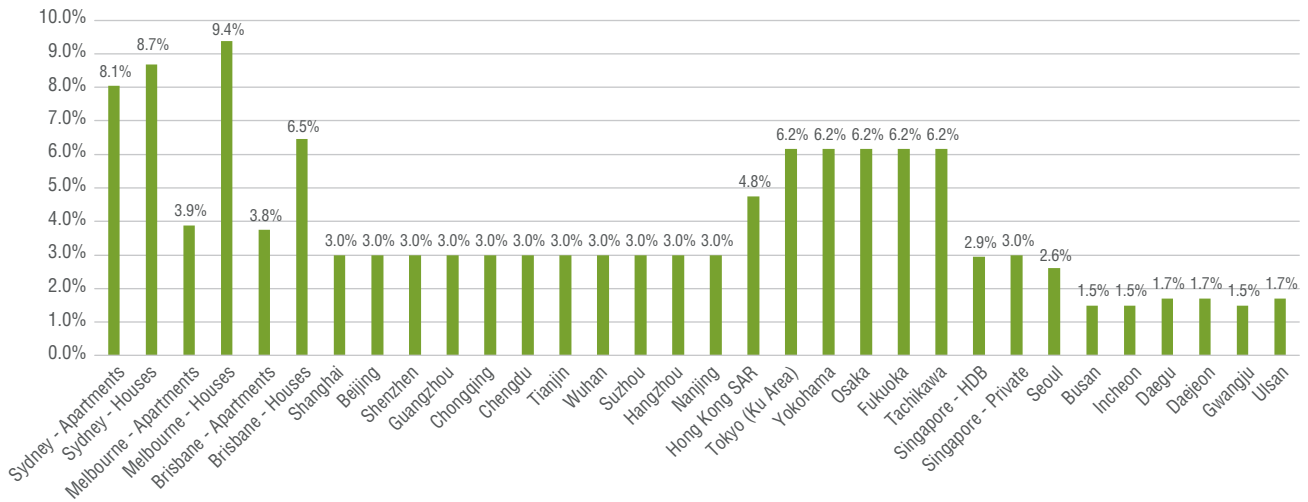
Singapore's high homeownership rate is very much tied to the government's policies that encourage homeownership. Most importantly, buyers of both HDB units and private homes can borrow against their retirement funds and in doing so, they need only pay 5 percent in cash for private homes and 0 percent for HDB units.

For cities in China, the relatively high homeownership rate is largely due to the housing privatization that started in 1998. Tenants in homes provided by government or state-owned enterprises were given the one-time option to purchase their homes at subsidized prices. With this one policy move, most families with residency permits became homeowners.

However, the homeownership rate for migrants is significantly low. To discourage speculation in real estate, many cities have adopted rules (such as requiring a minimum amount of residency) that make purchasing a home difficult for newcomers.

The study also evaluated other costs related to home purchase, such as purchase tax and brokerage fees. Australian cities have the highest one-time transaction costs due to a heavy purchase tax for single-family homes and apartments priced above a certain amount (see figure 16). In Melbourne and Brisbane, there is no purchase tax for apartment units at the median prices, but there is a purchase tax of 5.5 percent and 2.7 percent, respectively, for single-family homes.

FIGURE 16 Transactions Costs Borne by Homebuyers as Percentage of Purchase Price for Median-Priced Housing

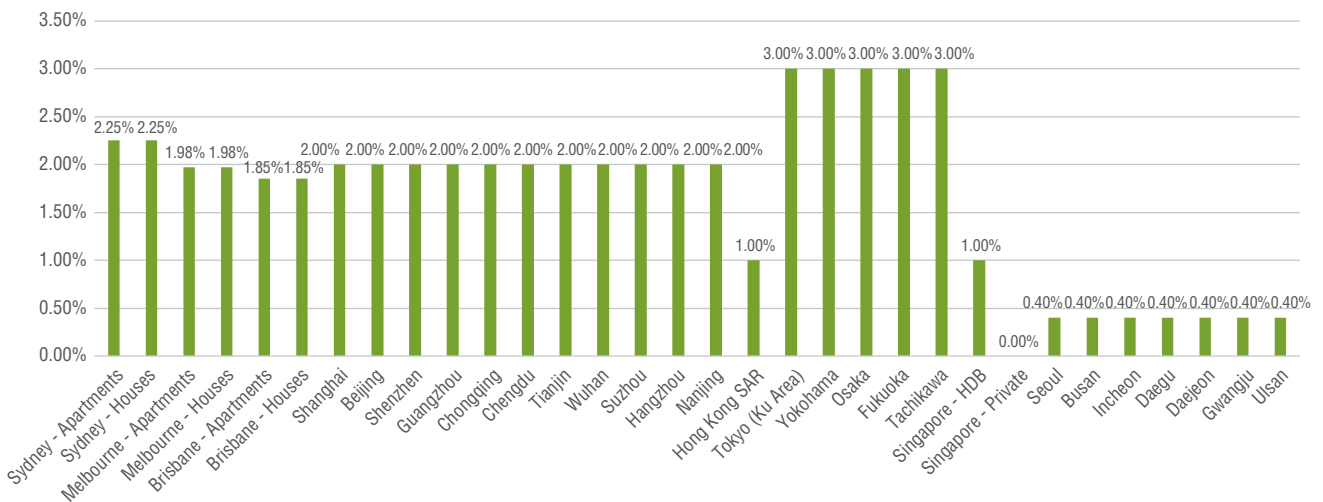


Notes:

1. Upfront transaction costs borne by buyers include purchase tax, lenders mortgage insurance, brokerage fees
2. Lenders mortgage insurance fees are currently missing except for Australia
3. In the case of Australian cities, if the LTV is less than 80%, the lenders mortgage insurance is not required, as such, the ratios here will drop by 2%

Japanese cities have high transaction costs of about 6 percent, and they consist of a 3 percent purchase tax and a 3 percent brokerage fee. In comparison, Seoul has a 3.3 percent purchase tax and other Korean cities have a 1.1 percent purchase tax. Korea's 0.4 percent brokerage fee is the lowest in the study (see figure 17).

FIGURE 17 Brokerage Fee as Percentage of Purchase Price for Median-Priced Housing

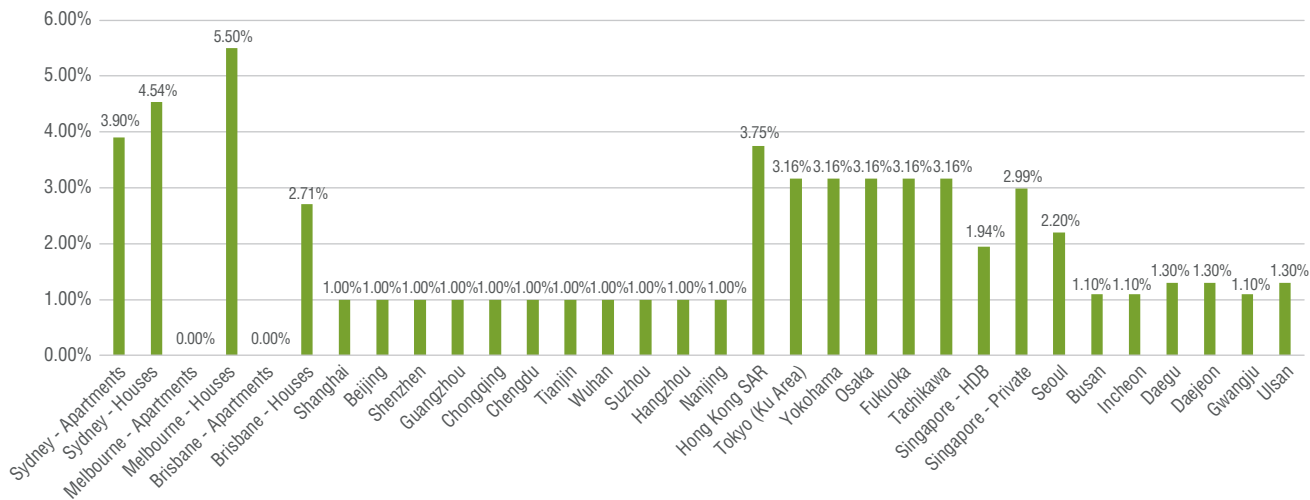


Notes :

1. In Japan, in addition to the standard 3% brokerage fee, buyers are required to pay 60,000 JPY (USD 450) of consumption tax for receiving brokerage services
2. In Singapore, buyers of private housing units usually don't pay brokerage fee

China's 1 percent purchase tax is the lowest (see figure 18) while its brokerage fee is 2 percent. Singapore has a low brokerage rate of 1 percent for HDB units and 0 percent for non-HDB units. As a result, anecdotally, Singaporean families frequently buy and sell homes as their housing needs change, which is in line with the government's intention.

FIGURE 18 Purchase Tax and Bank Fees as Percentage of Purchase Price for Median-Priced Housing



Notes:

1. Median apartment prices in Melbourne and Brisbane meet the local transaction duty exempt requirements
2. The rates for Japan include purchase tax and bank fees
3. Data on bank fees for other countries are not available

Looking Forward

High inflation rates around the world caused by COVID-induced stimulus spendings and expansive monetary policies prompted the United States and other countries to abruptly impose substantial hikes in interest rates. The U.S. Federal Reserve is expected to increase interest rates by as much as 2 to 3 percent to rein in the current inflation rate, which is the highest in the past four decades. Although it is unclear how much mortgage interest will increase for the countries in this study, it is expected to rise as Asian countries are also experiencing a high inflation rate.

A significant rise in mortgage interest rates will most likely cause home prices to decline. For existing homeowners with mortgage debt with a variable interest rate, the burden of a monthly mortgage payment will rise while the market value

of their home will likely decline. This turn of events will hit hard for recent homebuyers who have not experienced any substantial increase in home value. If housing prices decline as expected, housing affordability should improve in the region, which is good news for prospective homebuyers.

In growing economies, the housing sector has often been used as a lever to stimulate and slow down the economy. After overcoming the current inflation, governments may resort to stimulating the economy and housing sector by lowering borrowing rates and loosening restrictions that can restart the cycle of boom and bust. Perhaps, in the long run, the affordability of housing will depend on whether housing is treated as an essential good that governments should strive to provide at an affordable price for their citizens.



A residential area in downtown Shanghai.
Credit: Paixin

Key Markets

The cities and countries covered in the report are diverse in many aspects, including economic development, income level, demographics, lifestyle, types of housing, density, city planning, and housing policy. For each key market, we present statistics and analysis of these unique aspects that significantly affect housing attainability.

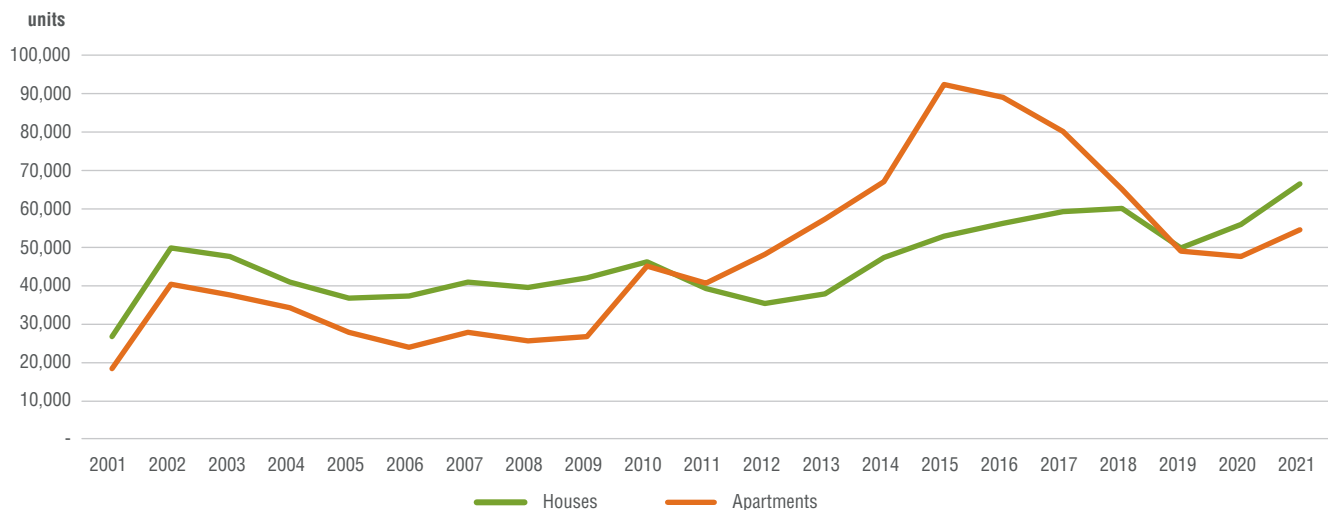
Australia

Australians consume the most housing in the Asia Pacific region, measured in terms of net floor area. In the metro areas of Sydney, Melbourne, and Brisbane, single-family homes are approximately 180 to 190 square metres and apartments are approximately 100 to 125 square metres.



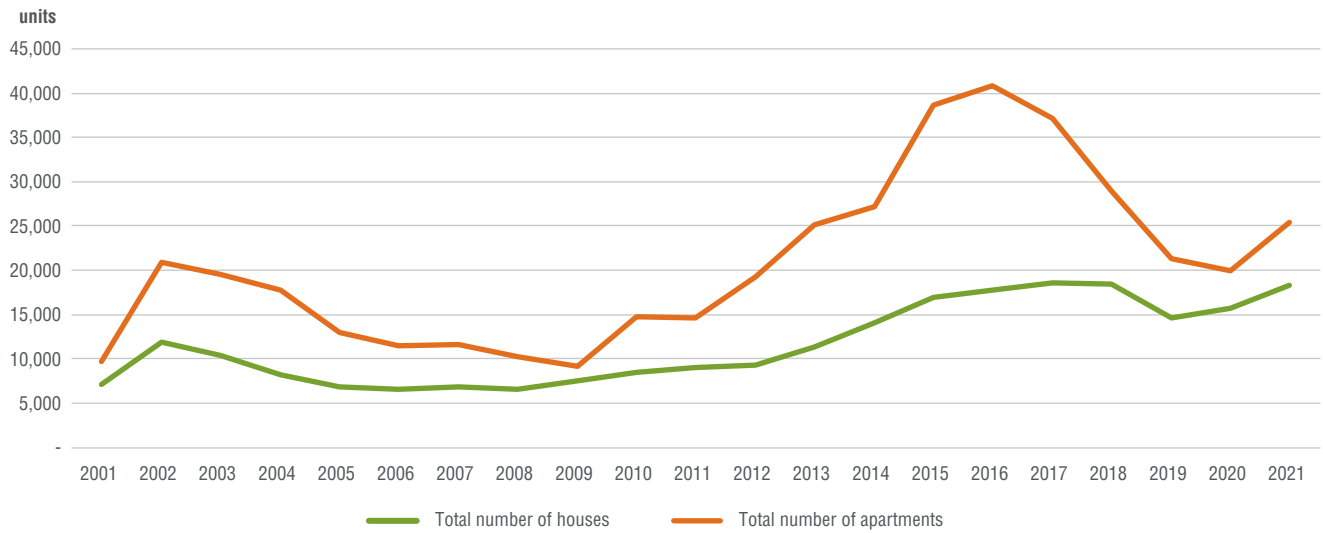
A neighbourhood of single-family homes in Sydney, Australia.
Credit: Paixin

FIGURE 19 Number of Dwelling Units Approved—Greater Sydney, Greater Melbourne, and Greater Brisbane



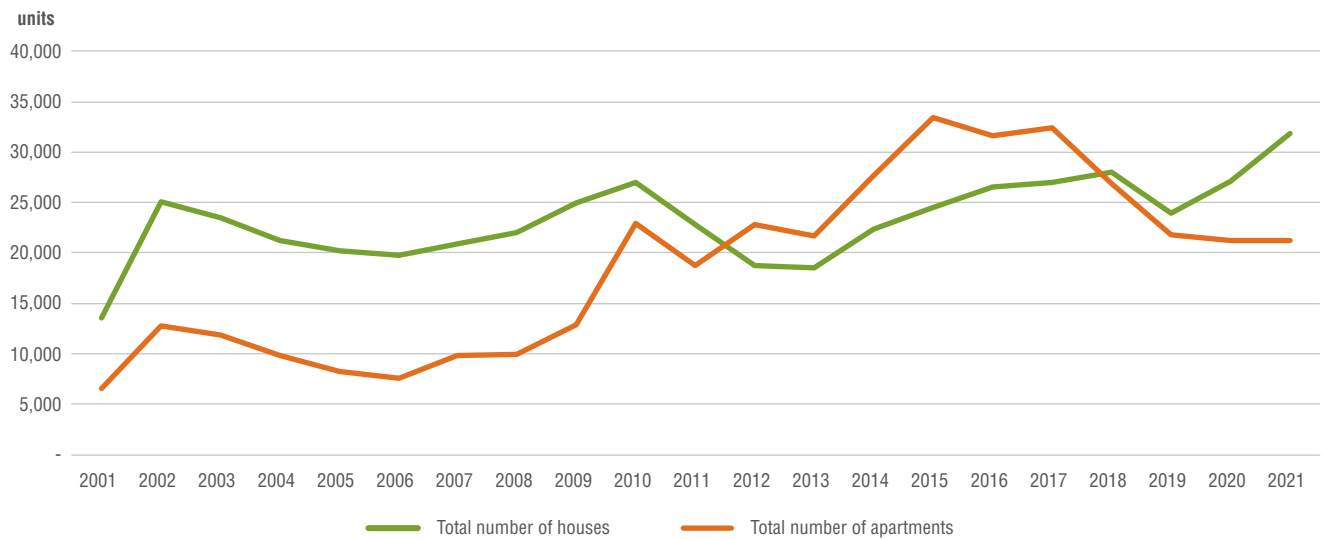
Source: Australian Bureau of Statistics.

FIGURE 20 Number of Dwelling Units Approved, Greater Sydney



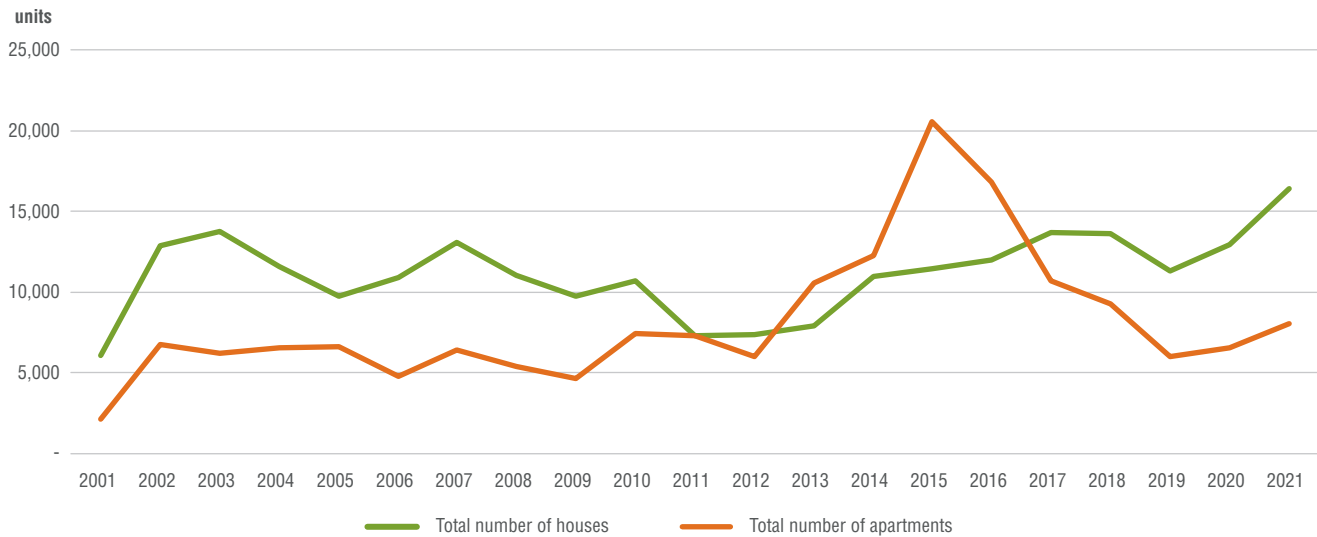
Source: Australian Bureau of Statistics.

FIGURE 21 Number of Dwelling Units Approved, Greater Melbourne



Source: Australian Bureau of Statistics.

FIGURE 22 Number of Dwelling Units Approved, Greater Brisbane



Source: Australian Bureau of Statistics.

During the past two decades, more apartment units have been built relative to single-family homes (see figure 20). Since 2001, in Greater Sydney, where this trend is most obvious, 436,587 apartment units have been approved, 79 percent more than the number of single-family homes approved (see figure 20).

However, in the past few years, more single-family homes than apartment units have been approved for the country's largest metropolitan areas, reversing the trend (figure 19).

Single-family homes are roughly double the price of apartment units. Moreover, single-family homes at the current median prices are subject to substantial purchase tax for buyers, while there is zero tax for apartment units in Melbourne and Brisbane.

Among the three cities, Sydney's housing prices are highest. Sydney has the highest price-to-income ratio of 15.1 for single-family homes and 7.5 for apartment units. Melbourne's housing prices are approximately 30 percent lower than Sydney's, and its price-to-income ratio is 11.0 and 5.9 for single-family homes and apartment units, respectively.

Monthly rent-to-income ratios for the three Australian cities range from 20 to 30 percent. When taking into consideration the large size of rental units (140 to 150 square metres for single-family homes and 80 to 100 square metres for apartment units), Australia has the lowest rent cost per square metre of all the countries in the study.

China

During the past three decades, cities in China have experienced a rapid increase in population, which has resulted in an unprecedented development of housing stock and urban infrastructure. The urbanization rate more than doubled from less than 30 percent in 1990 to approximately 65 percent in

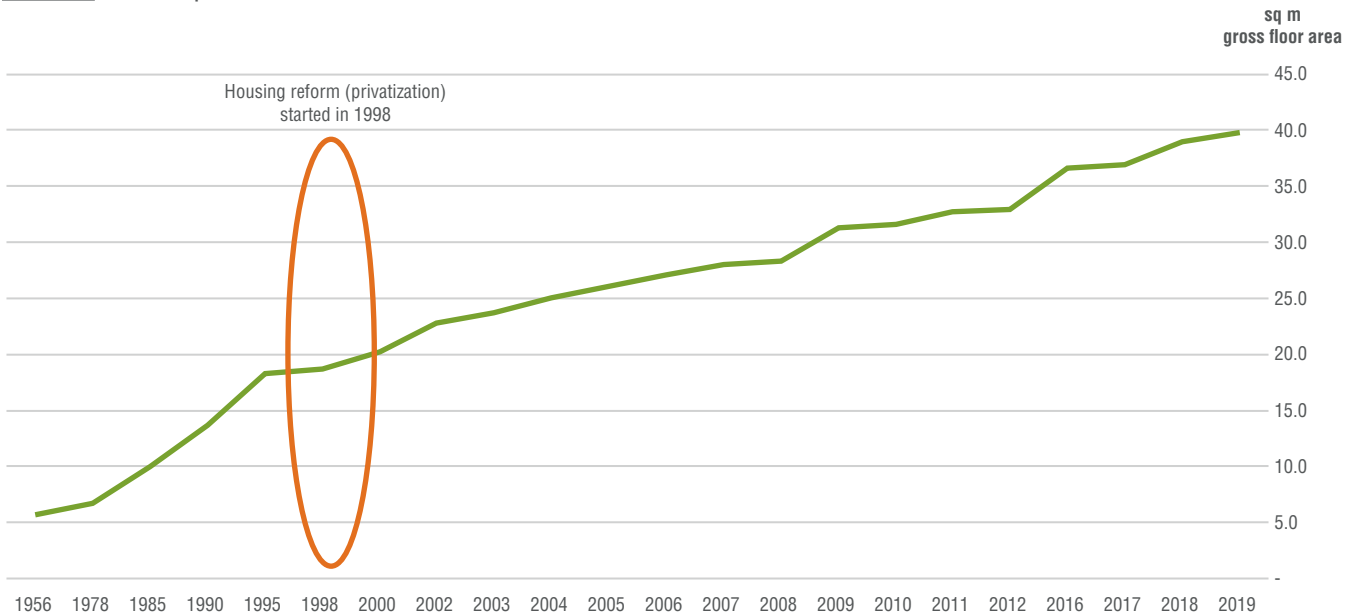
2021 and the total population grew by more than 200 million (see figure 23). Since the housing market privatization that started in 1998, per capita floor area for urban residents has more than doubled from less than 20 square metres of gross floor area to the current 40 square metres (or about 32 square metres in net floor area) (see figure 24).

FIGURE 23 Urban and Rural Population, and Urbanization Rate



Source: National Bureau of Statistics, China.

FIGURE 24 Per Capita Floor Area for China's Urban Residents

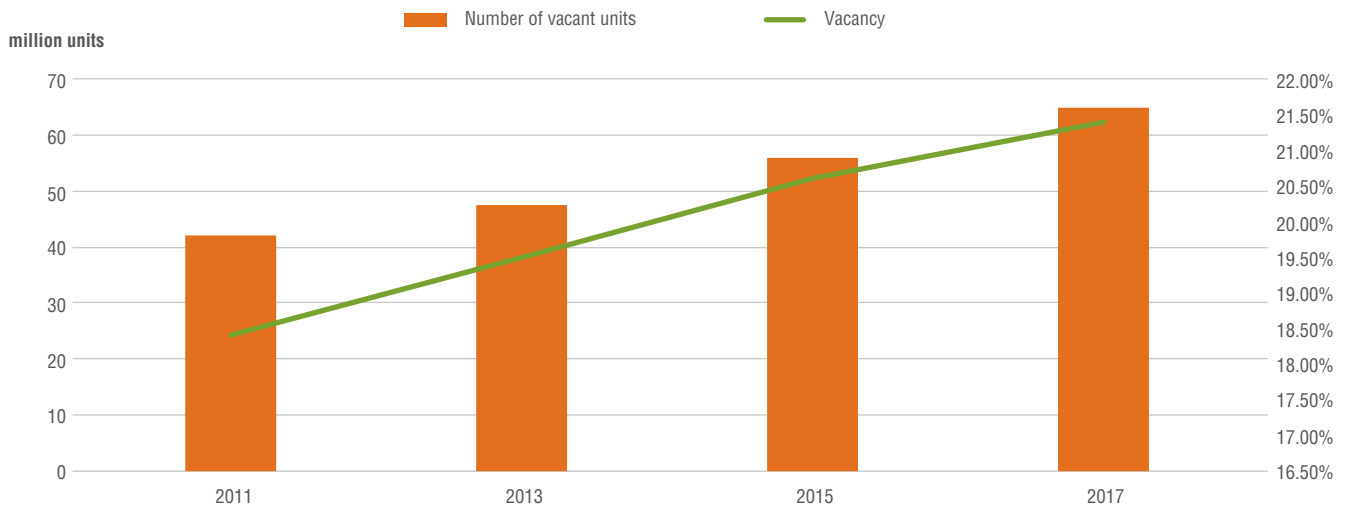


Source: National Bureau of Statistics, China.

As cities have continued to experience rapid expansion of housing stock, vacant urban homes have exceeded 60 million units, representing a vacancy rate of more than 20 percent, according to the China Household Finance Survey by Southwestern University of Finance and Economics (see figure 25). Many migrants who cannot afford to buy homes

in the cities where they work and live end up using their savings to buy homes in their hometown, where they plan to eventually return. Often such units are left vacant. Also, the bare-shell nature of many homes in China, coupled with no periodic property tax, make it easier for people to buy and leave units empty until they are ready to move in.

FIGURE 25 Vacant Housing Units and Vacancy in China's Urban Areas



Source: China Household Finance Survey, Southwestern University of Finance and Economics.

During the past decade, entrepreneurial startups have emerged to lease such vacant units for at least five years and to fit out the units and operate them as rental units. In Tier

1 cities of Shanghai and Beijing, real estate fund managers have started operating entire residential towers as rental units that cater to young local professionals.

Shanghai

A closer look at Shanghai's housing situation provides a more nuanced understanding of the housing affordability issue not only in China but also for other gateway cities suffering from limited housing affordability.

Longtime residents with hukou (family registry) likely own two or more units. One unit would be from the time of the

privatization in 1998 and any additional units would have been acquired after 1998 but before housing prices increased beyond these residents' financial capability. Therefore, during the past two decades, for most households with hukou, these households have benefitted financially from the increase in home prices, and the children of these households, who are often the only child in a family, are well provided for and unaffected by high home prices.

FIGURE 26 Shanghai Population Breakdown (2020)

| | Permanent residents (thousand ppl) | Registered permanent residents (thousand ppl) | External permanent residents (thousand ppl) |
|---|---------------------------------------|--|--|
| Total | 24,871 | 14,391 | 10,480 |
| 0–4 | 858 | 521 | 336 |
| 5–9 | 914 | 591 | 323 |
| 10–14 | 665 | 469 | 196 |
| 15–19 | 710 | 395 | 315 |
| 20–24 | 1,514 | 441 | 1,073 |
| 25–29 | 2,206 | 603 | 1,603 |
| 30–34 | 2,741 | 1,027 | 1,715 |
| 35–39 | 2,296 | 1,213 | 1,083 |
| 40–44 | 1,858 | 1,031 | 826 |
| 45–49 | 1,776 | 840 | 936 |
| 50–54 | 1,786 | 891 | 895 |
| 55–59 | 1,732 | 1,183 | 549 |
| 60–64 | 1,767 | 1,499 | 267 |
| 65–69 | 1,648 | 1,438 | 210 |
| 70–74 | 1,014 | 930 | 84 |
| 75–79 | 552 | 516 | 36 |
| Above 80 | 836 | 805 | 31 |
| Ageing population (65 and older) | 4,049 | 3,688 | 361 |
| % of total population | 16.3% | 25.6% | 3.4% |
| Young working population (20–39) | 8,757 | 3,283 | 5,474 |
| % of total population | 35.2% | 22.8% | 52.2% |

Source: Shanghai Statistics Bureau.

Clearly, limited housing affordability disproportionately affects newcomers. In Shanghai, of the total young working population of nearly 8.8 million (ages 20 to 39), new city dwellers without hukou account for 62.5 percent. New city dwellers without hukou face housing attainability challenges because they are negatively affected by the housing purchasing restrictions in Shanghai (new city dwellers without hukou must be married and prove that they have five years' working experience in the city to be eligible for home

purchase) and they usually do not have any legacy property in the city.

Shanghai's society is ageing—25.6 percent of its registered residents are 65 and older. Again, longtime residents with hukou, in general, have their own home with limited carrying costs for their retirement, while migrants without hukou in the city will most likely need to return to their hometown, where they likely own a home, for retirement.

Shenzhen

Among the four Tier 1 cities in China, Shenzhen has the smallest land area. Compared with the other Tier 1 cities, Shenzhen’s land size is about 33 percent of Shanghai’s land size and 27 percent of Guangzhou’s. Yet, its less than 2,000 square kilometres of land area is double that of Hong Kong’s and three times that of Singapore’s land size.

As mentioned earlier (see table 2), in the past two decades Shenzhen had the smallest amount of new “legal” home construction among the Chinese cities in the report. Between 2002 and 2020, Shenzhen had just 71 million square metres of newly completed housing, or over 4 square metres per capita of total resident population, compared with 9 square metres in Guangzhou and 14 square metres in Shanghai.

The gap in housing has been filled by informal housing, meaning homes without legal titles. In 2010, according to the most recent information released by the government, illegal housing accounted for approximately 48 percent of the total floor area of existing housing stock in Shenzhen. In 2010, up to 8 million people in Shenzhen, approximately 75 percent of the city’s total population, lived in illegal housing. About 44 percent of the existing illegal housing (residential use) had been sold to non-villagers, and commercial lenders played an important role in providing both development loans to land developers and villagers and “mortgage loans” to buyers with a pledge from the village co-ops.



A residential neighborhood in Shenzhen, China.
Credit: Paixin

According to the 2020 research report *Housing Affordability in Chinese Cities*, by Sun Li of University of Leeds, Shenzhen is the least expensive in terms of capital value and rental cost of informal housing. The report estimates about one-half of the housing stock in Shenzhen is informal housing. Likely, the huge supply of informal housing plus the relatively low quality of such housing makes informal housing inexpensive. Shenzhen’s informal housing is priced at 1.8 times annual household income, whereas most cities have price-to-income ratios of 4 to 6 times for informal housing units. For informal housing rental units, Shenzhen’s 16 percent rent-to-income ratio is the lowest of the cities in the study—for most cities the ratio ranges from 20 to 40 percent.

TABLE 5 Comparison of New York City and Shenzhen (2014–2015)

| | Population | Land (sq km) | Population in illegal housing |
|---------------|------------|--------------|-------------------------------|
| New York City | 8,491,079 | 783.8 | 300,000 to 500,000 |
| Shenzhen | 10,628,900 | 1,996.8 | Up to 8 million |

Sources: Qiao, Shitong, “Dealing with Illegal Housing: What Can New York City Learn from Shenzhen”, *Fordham Urb. L.J.* 43 (2016): 713, <https://ir.lawnet.fordham.edu/ulj/vol43/iss3/6/>.

Population of New York City: Department of City Planning of New York, Census Bureau Estimates for July 1, 2014, Population: Current Population Estimates, <https://www1.nyc.gov/site/planning/planning-level/nyc-population/current-future-populations.page>.

Land area of New York City: State & County QuickFacts: New York, U.S. Census Bureau (Dec. 2, 2015), <https://www.census.gov/quickfacts/NY>.

Population and Land Area of Shenzhen: Statistics Bureau of Shenzhen City & Shenzhen Survey Office of the State Statistics Bureau, Shenzhen Statistical Yearbook 2014, § 1.1.2 (2014), <http://www.szstj.gov.cn/nj2014/indexce.htm>.

Population in illegal housing in New York City: *New York’s Housing Underground: A Refuge and Resource*, <https://chhayacdc.org/wp-content/uploads/2019/11/New-Yorks-Housing-Underground.pdf>.

Population in illegal housing in Shenzhen: Shitong Qiao, “Small Property, Big Market: A Focal Point Explanation”, *AM. J. COMP. L.* 63, no. 197 (2015): 207–08.

Hong Kong SAR

Although it is well-known that Hong Kong is one of the most expensive places to live and its housing is extremely unaffordable, it is not well-known that approximately one-half of Hong Kong residents live in heavily subsidized public housing units.

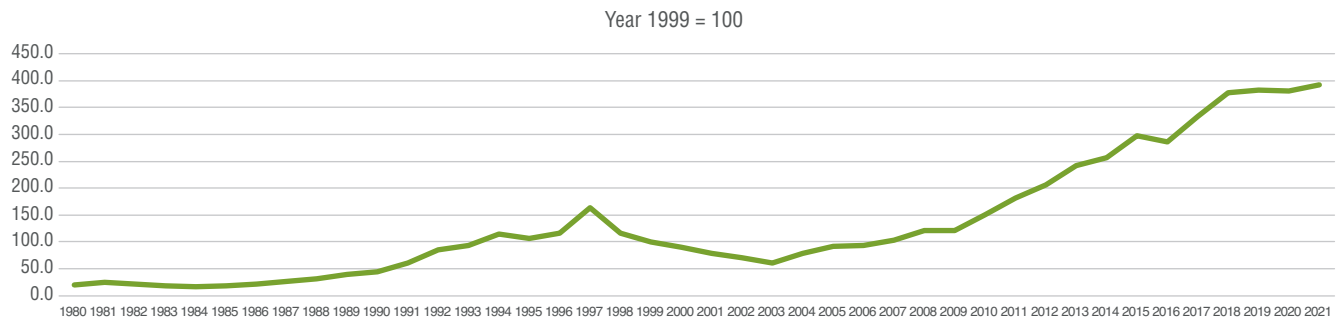
In stark contrast to Singapore, where most HDB units are owned by households, nearly 70 percent of public housing

units in Hong Kong are for rent. For public housing rental units, monthly rent can be less than 10 percent of tenants' income. The huge gap between nonpublic and public housing costs means there is a long queue for public housing units that can take as long as six years. So, for those lucky enough to be living in public housing units, the housing burden is among the lowest of all the cities in the study. In general, public housing units for sale are sold to qualified residents at deeply discounted prices compared to market prices.



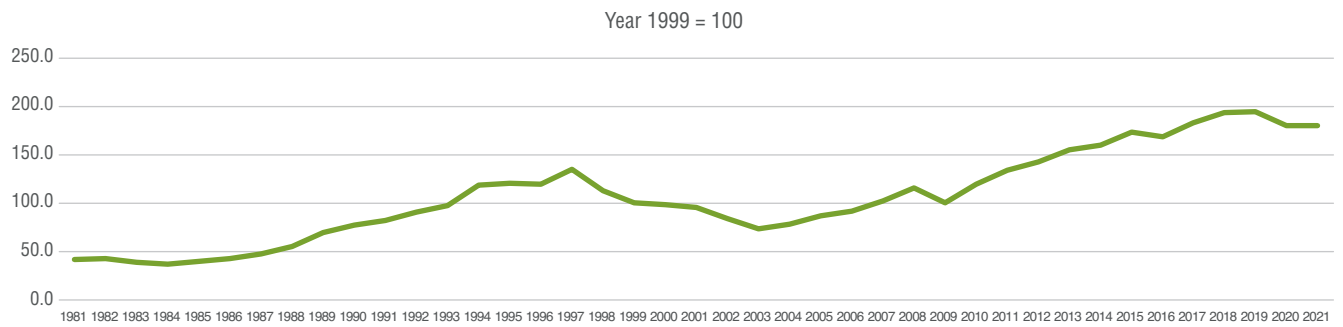
A residential area in Hong Kong.
Credit: Paixin

FIGURE 27 Private Residential Price Indices



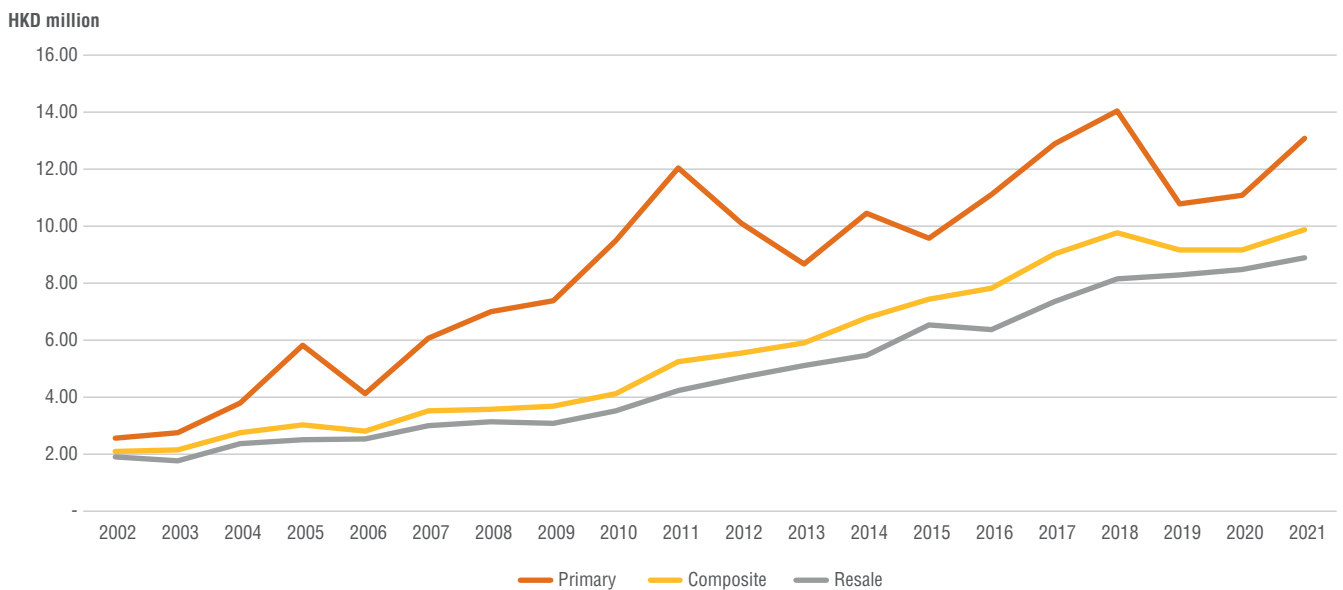
Source: Census and Statistics Department, Hong Kong SAR.

FIGURE 28 Private Residential Rent Indices



Source: Census and Statistics Department, Hong Kong SAR.

FIGURE 29 Average Transaction Price Per Unit



Source: Census and Statistics Department, Hong Kong SAR.

Since 2003, the price of private housing in Hong Kong has increased approximately six times (see figure 27) and rent has increased about 150 percent (see figure 28). In Hong Kong, a typical downpayment for home mortgage loans is about 40 percent, the highest in the Asia Pacific region. Based

on interviews with housing experts, the high downpayment provides sufficient protection for local lenders in the event of a substantial market-price correction. With the Hong Kong dollar pegged to the U.S. dollar, the interest rate in Hong Kong is likely to rise in line with the U.S. interest rate.

TABLE 6 Land-Use Breakdown, Hong Kong SAR (2020)

| Category | Area | Percent | Remarks |
|---|------|---------|---|
| Private Residential | 27 | 2.4 | Including residential area developed by private developers (excluding village houses, subsidised housing, and temporary housing area) |
| Public Residential | 17 | 1.5 | Including subsidised housing and temporary housing area |
| Rural Settlement | 35 | 3.1 | Including village houses and temporary structures |
| Commercial/Business and Office | 5 | 0.5 | |
| Industrial Land | 7 | 0.6 | |
| Industrial Estates/Science and Technology Parks | 3 | 0.3 | |
| Warehouse and Open Storage | 17 | 1.5 | |
| Government/Institutional and Community Facilities | 25 | 2.2 | |
| Open Space and Recreation | 28 | 2.5 | Including parks, stadiums, playgrounds, and recreational facilities |
| Roads and Transport Facilities | 47 | 4.2 | |
| Railways | 4 | 0.4 | |
| Airport | 13 | 1.2 | |
| Port Facilities | 4 | 0.4 | |
| Cemeteries/Funeral Facilities | 9 | 0.8 | |
| Utilities | 9 | 0.8 | |
| Vacant land/Construction in Progress | 18 | 1.6 | |
| Others | 12 | 1.1 | |
| Agricultural land | 49 | 4.4 | |
| Fish Ponds/Gei Wais | 16 | 1.4 | |
| Woodland | 289 | 25.9 | |
| Shrubland | 254 | 22.8 | |
| Grassland | 183 | 6.4 | |
| Mangrove/Swamp | 6 | 0.5 | Including about 4 sq km of mangrove and swamp below the high water mark |
| Badland | 2 | 0.2 | |
| Rocky Shore | 4 | 0.4 | |
| Reservoirs | 25 | 2.2 | |
| Streams and nullahs | 6 | 0.5 | |

Source: Land Planning Department, Hong Kong SAR.

Hong Kong's high home price is tied to the high cost of land and the relatively difficult and time-consuming nature of new project development. A significant portion of the territory is designated as green belt, which prevents development. Based on interviews, agricultural land in the New Territory, most of which serves as a tourist attraction area, provides the most potential for new home development. As for the redevelopment of existing buildings, only buildings that are 50 years or older are eligible, and a high percentage of homeowners in those buildings must consent to a redevelopment plan.

With an accelerating integration of the nearby cities in the Greater Bay Area, there appears to be significant potential to develop areas in the northern part of the city near the border with Shenzhen. For new, large-scale development projects, both public- and private-sector housing projects will need to coexist to succeed. Public housing projects can bring in a sufficiently large population to justify new urban infrastructure and public service amenities, and private housing units can help finance development costs for the government.

Tokyo and other Japanese cities

Overall, Japan's cities have relatively low homeownership rates compared with the other cities in the study. Fukuoka, Osaka, and Tokyo have the three lowest homeownership rates, which range from 37 to 42 percent. Only Yokohama has a homeownership rate of more than 50 percent.

In Tokyo-Ku, the average price of new condos is 16.6 times annual median household income; in Osaka, it is 13.2 times annual median household income; and in Yokohama, the average price of new and resale condos is 15.4 times annual median household income. In Tachikawa, a satellite city of Tokyo, the average price of new and resale condos is 10.1 times annual median household income. In Fukuoka, a city that is 880 kilometres east of Tokyo, the median resale condo price of US\$180,000 is 5.5 times median household income.

Monthly rents range from 17 to 22 percent of median household income for the Japanese cities in the report.

Clearly, low rent coupled with high home prices should disincentivize people from buying homes. To encourage home purchases, Japan has a low minimum required downpayment of 10 percent, and anecdotally, lenders extend mortgage loans that represent 95 percent of homes' value.

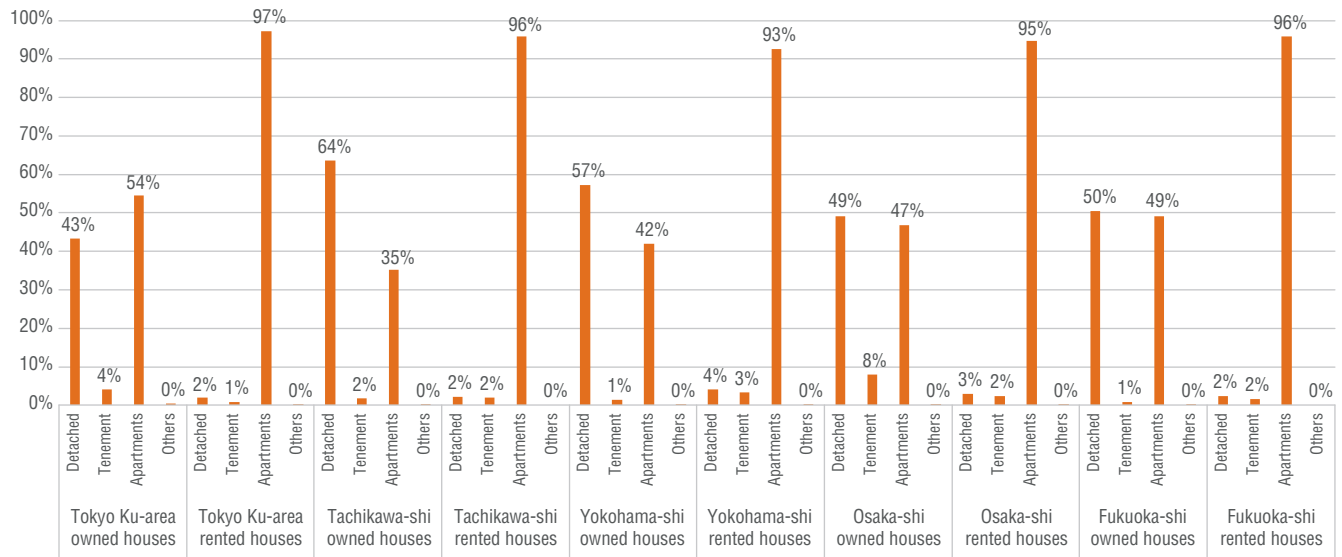
A low homeownership rate may partly be caused by high, one-time transaction fees (consisting of purchase tax and brokerage fees that can exceed 6 percent of home price) that buyers must bear. For young professionals who are more likely to switch jobs or relocate, a home purchase comes with high unrecoverable transaction costs.

Japan's urban housing stock for ownership is roughly split between single-family homes and apartment units. In Tokyo-Ku, apartments represent 54 percent of owner-occupied homes and single-family homes represent 43 percent of owner-occupied homes (see figure 30). For rented units, approximately 97 percent are apartments.



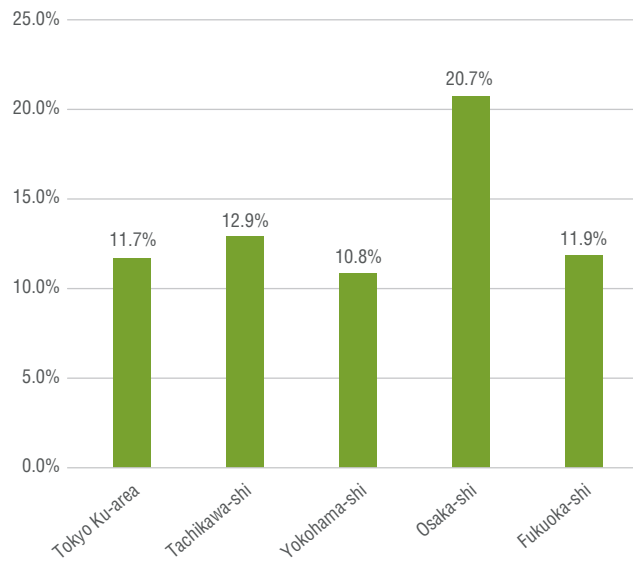
A bird's-eye view of a residential area in Tokyo.
Credit: Paixin

FIGURE 30 Housing Stock Breakdown by Housing Type (2018 Housing and Land Survey)



Source: Statistics Bureau of Japan.

FIGURE 31 Housing Vacancy (2018 Housing and Land Survey)



Source: Statistics Bureau of Japan.

Vacancies are relatively high in Tokyo, at 11.7 percent, and Osaka has the highest vacancy at 20.7 percent (see figure 31).

Since 2014, in Tokyo-Ku, prices of “condos” or high-rise apartments have risen substantially, whereas prices of detached, single-family homes have stayed nearly the same. Based on interviews, centrally located condos have gained in popularity among “power couples” who prefer the central locations because of their access to amenities including top schools and high-end shopping.

According to a housing expert from Japan, Japan’s urban housing market has been greatly affected by the burst of the housing bubble that occurred in 1990 and the 1995 earthquake near Kobe, known as the Great Hanshin earthquake. The housing bubble burst and the subsequent loss of wealth for most homeowners have led to a loss of confidence in housing as a reliable investment. On the other hand, the Great Hanshin earthquake led to more stringent building codes that require substantial building upgrades, especially for detached homes. Only 31 percent of the current housing stock in Tokyo was built in 1990 or earlier. According to available statistics, the median age of homes in Tokyo is approximately 25 years.

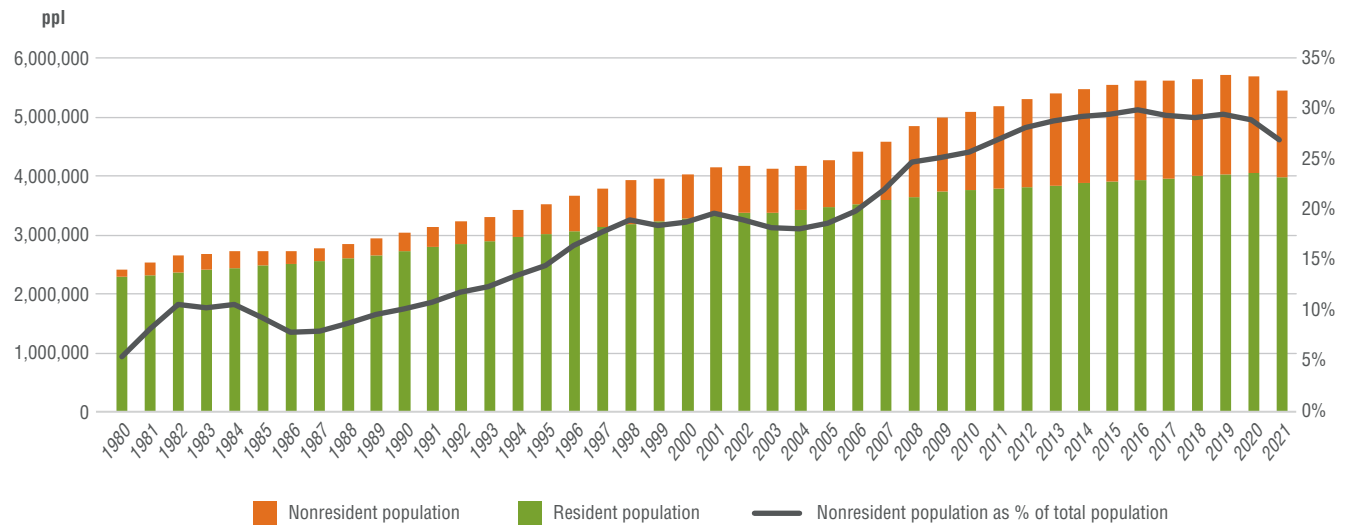
Singapore

Singapore's population of 5.3 million consists of Singaporeans (66 percent), foreign residents (9 percent), and foreign workers (domestic workers, construction workers, etc.; 25 percent) (see figure 32).



A residential neighbourhood in Singapore.
Credit: Paixin

FIGURE 32 Total Population Breakdown

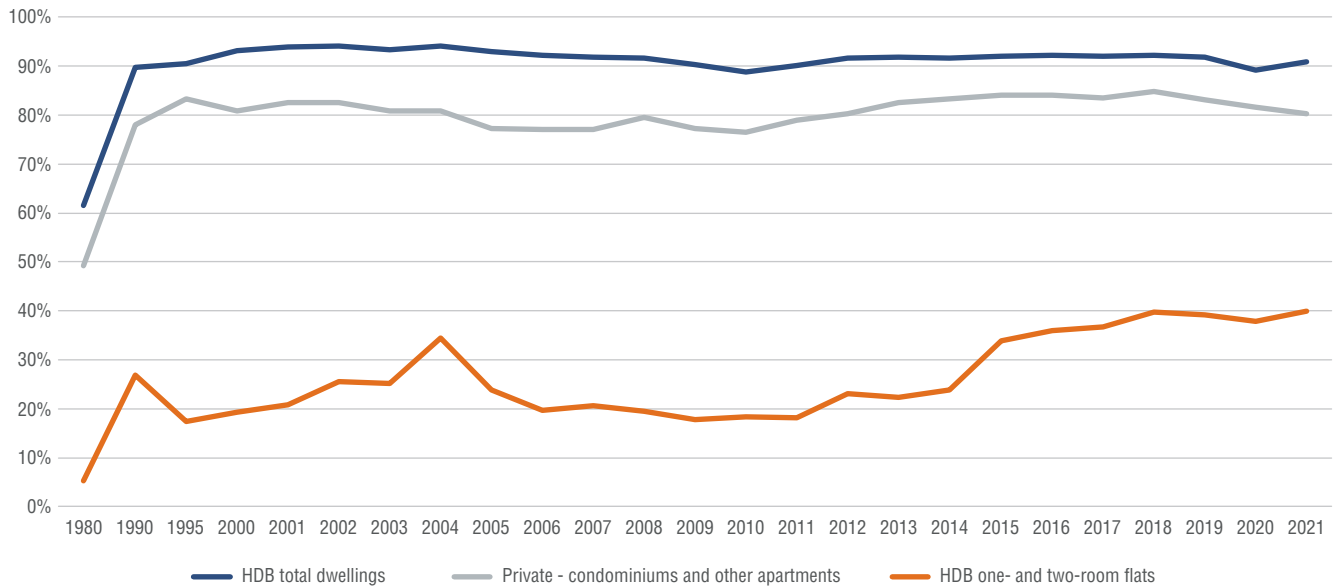


Source: Department of Statistics, Singapore.

Perhaps the most striking feature of Singapore’s housing sector is the government’s active participation and commitment to increase homeownership. More than 1 million units are HDB units, whereas less than 400,000 units are private residential properties, approximately 85 percent of

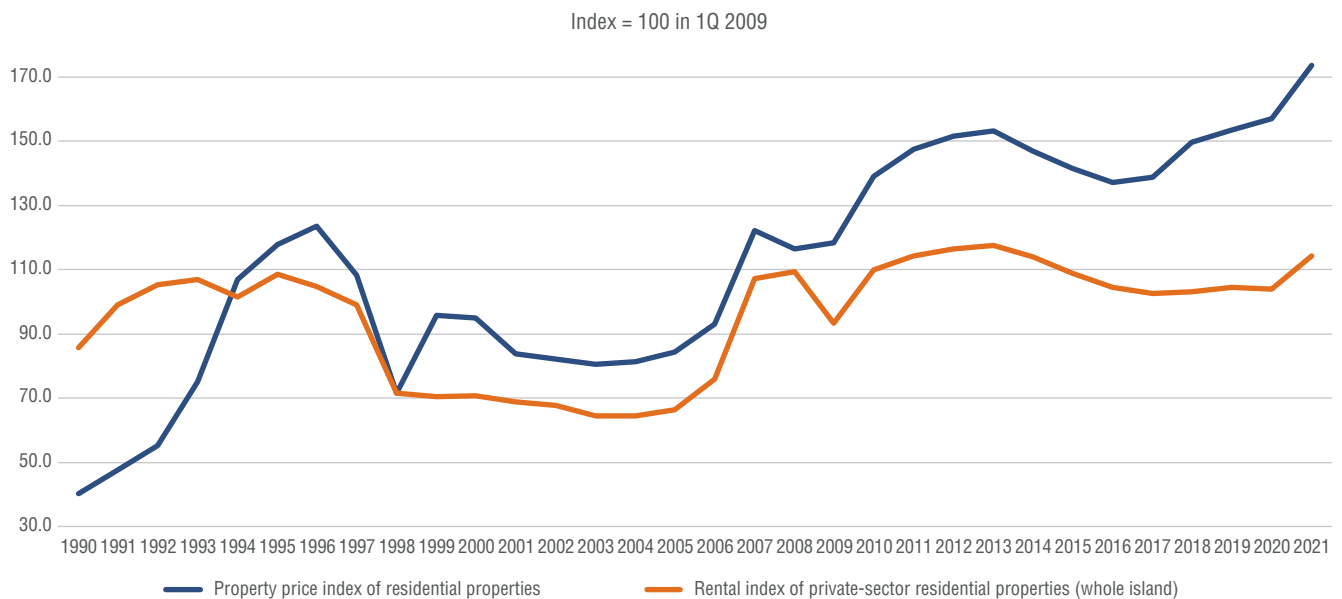
which are owned by Singaporeans (see figure 33). Compared with housing prices of gateway cities in the study, the price of housing in Singapore has remained relatively stable and affordable. During the past decade, the rent index for private residential properties has essentially stayed the same.

FIGURE 33 Homeownership by Type of Housing



Source: Department of Statistics, Singapore; Housing and Development Board, Singapore; Urban Redevelopment Authority, Singapore.

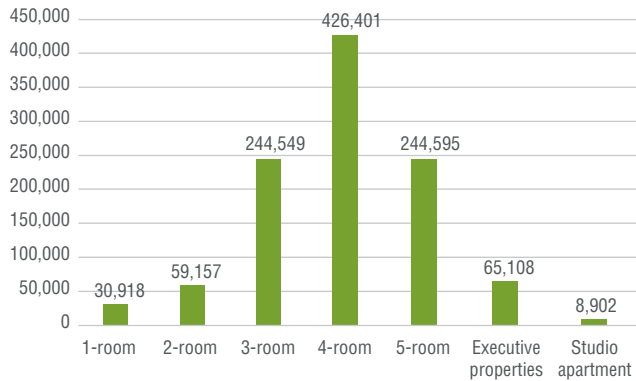
FIGURE 34 Private Residential Price and Rental Indices



Source: Urban Redevelopment Authority, Singapore.

HDB units in Singapore are considerably larger than units in other cities. More than 60 percent of HDB units have four or more rooms, and less than 10 percent are one- or two-room units (see figure 35). With an average size of 98 square metres, HDB units in Singapore are nearly twice the size of private housing units in Hong Kong and they are 44 percent larger than units in Seoul.

FIGURE 35 HDB Housing Stock Breakdown by Type (2020)



Source: Department of Statistics, Singapore; Housing and Development Board, Singapore.

Note: Room counts include a living room.

The low cost of HDB units is tied to the high priority the Singapore government has placed on providing affordable housing to its citizens. It is understood that the government owns approximately 90 percent of the country's land, having continued to accumulate land since the country's independence in 1965.

At about US\$10,000 per square metre, even private residential units that cater to wealthier households are priced substantially lower than comparable housing in Hong Kong and Tokyo. Singapore's policy on redevelopment of existing buildings is considerably lax when compared with the policies of other countries and cities. Ten years after construction is completed, buildings can be redeveloped if 80 percent or more of the homeowners agree to a redevelopment plan. In comparison, the same policy has a 50-year requirement in Hong Kong and more than 40 years in Korea.

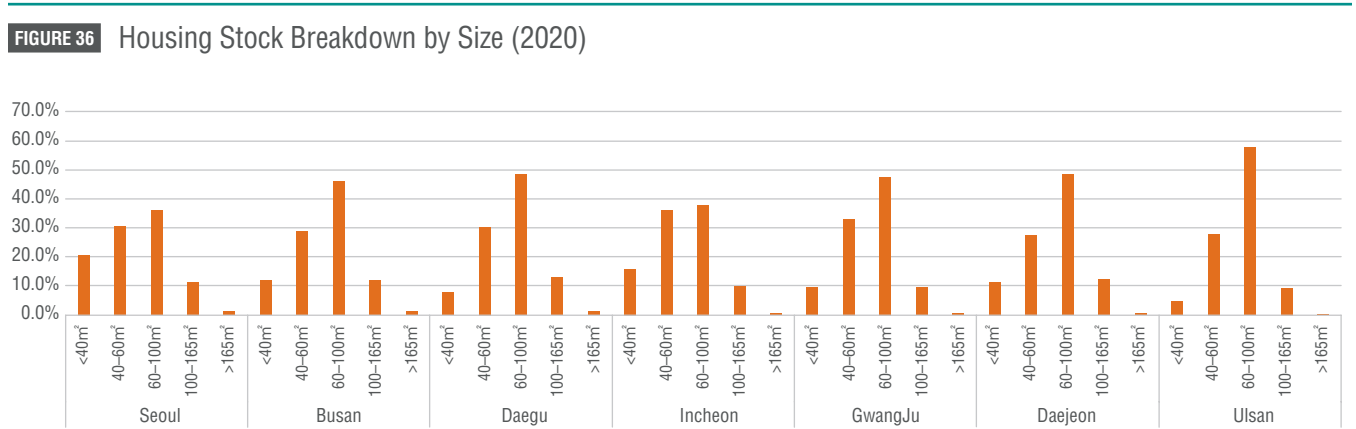
Regarding the housing stock for domestic workers and foreign workers in construction, no information was obtained. It is worth noting that a large percentage of Singaporean households have live-in domestic help. Most foreign construction workers and physical laborers live in workers' housing units where as many as 10 people live in one room in four- to five-story dormitory buildings. Anecdotally, there is an ongoing discussion between the government and businesses that employ foreign workers about raising the housing standards for foreign workers.

Seoul

As the political, cultural, educational, and commercial center of the country, Seoul is the most vibrant city in the country, attracting a disproportionately large number of young people from other parts of the country and even from abroad. Reflecting the city's large population of young migrants, units less than 20 square metres in size represent 20 percent of the housing stock (the highest in Korea) while in other cities the ratio is less than 10 percent (see figure 36).

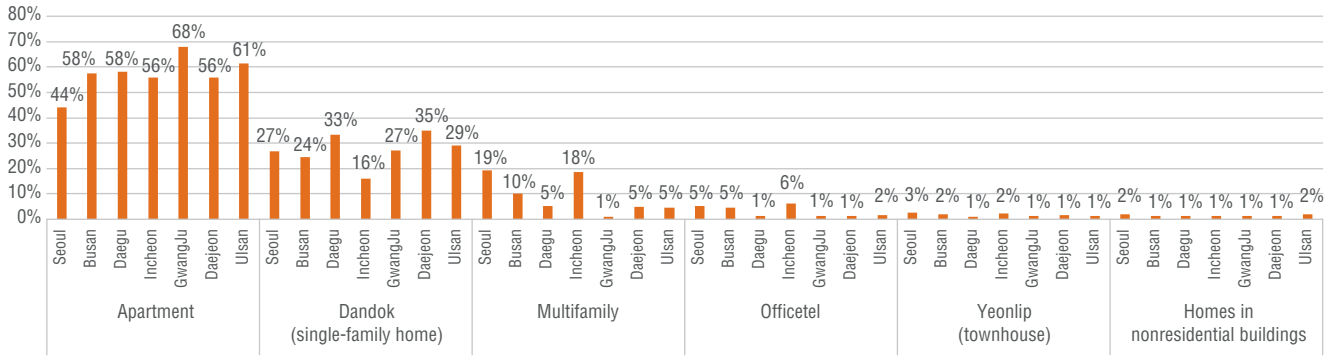


A residential neighbourhood in Seoul.
Credit: Paixin



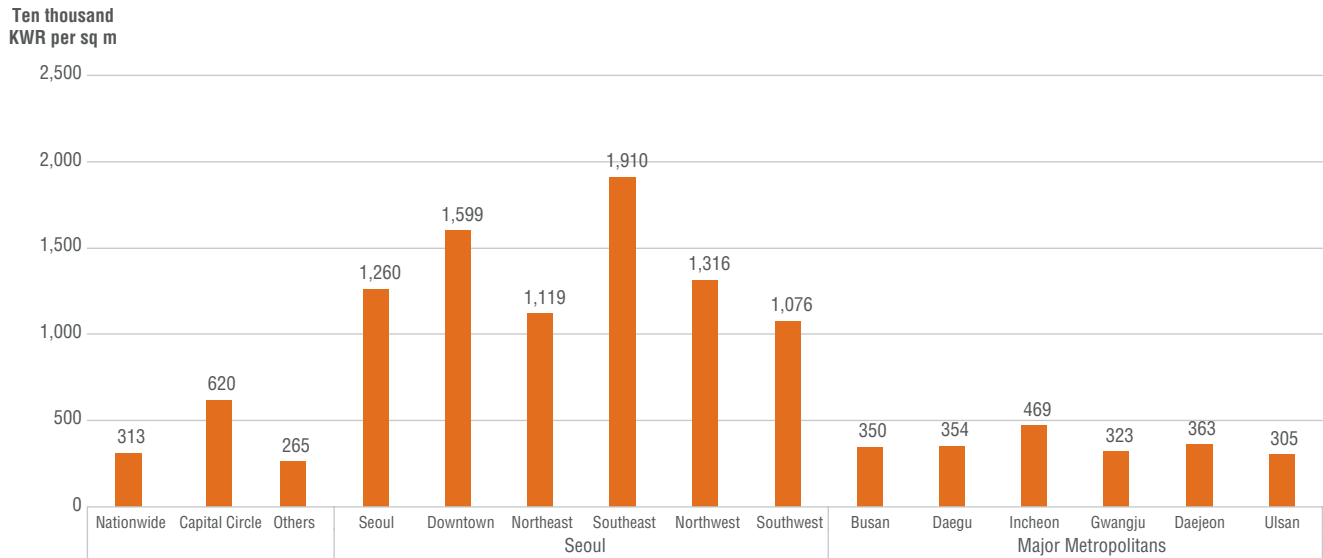
Source: Korean Statistical Information Service (KOSIS).

FIGURE 37 Housing Stock Breakdown by Type (2020)



Source: Korean Statistical Information Service (KOSIS).

FIGURE 38 Median Apartment Transaction Price (December 2021)



Source: Korea Real Estate Board.

Yet, when it comes to the types of housing available, Seoul has fewer apartments (44 percent of total housing stock) than the other cities, where apartments represent between 56 and 68 percent of total housing stock (figure 37). In Seoul, single-family homes represent 27 percent of total housing stock and villas (small-scale multifamily units) represent 19 percent, the highest in the country.

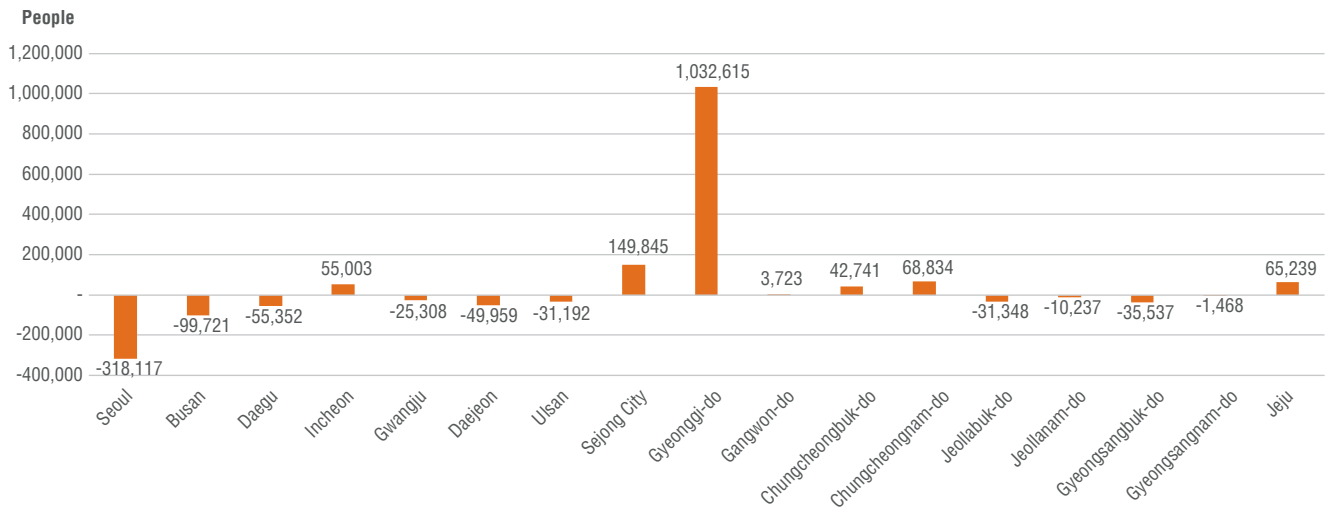
Within Seoul, there is a large variance in price by location. In the southeastern part of the city (popularly known as Gangnam), the average price is nearly KRW19 million per square metre or US\$14,700 per square metre, more than

70 percent higher than the average price in the northeastern part of the city on the northern side of the Han River (figure 38). The northern part of the city saw a rapid growth of low-rise buildings after the Korean War, especially during the 1960s and 1970s. Development in the southern part of the city began in the 1980s; this area has since become the most popular and expensive place to live, with high-rise apartments dominating the urban landscape. The northern part of the city, with its many palaces, funky neighborhoods, and K-Pop and movie studios, is undergoing steady urban regeneration.

Between 2015 and 2020, as a result of the slow pace of new housing development in Seoul and the fast growth of nearby cities in Gyeong-gi Province, Seoul's population decreased by nearly 320,000 while Gyeong-gi Province's population grew by more than 1 million (figure 39). The average housing price per square metre in Gyeong-gi Province is one-half the

average housing price in Seoul. With improved railway access to Seoul and other key metro areas in the country, satellite cities in Gyeong-gi Province are becoming increasingly popular and Korea's top companies continue to move their headquarters to these less expensive and well-connected cities.

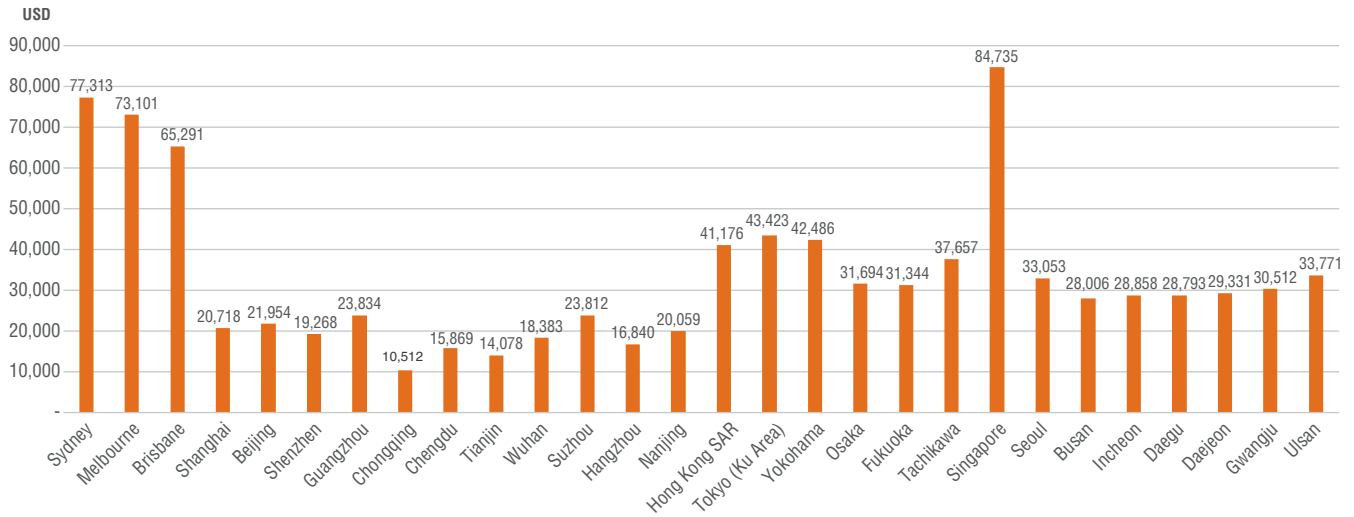
FIGURE 39 Population Change (2015–2020)



Source: Korean Statistical Information Service (KOSIS).

Appendix: Additional Graphs and Data Sources

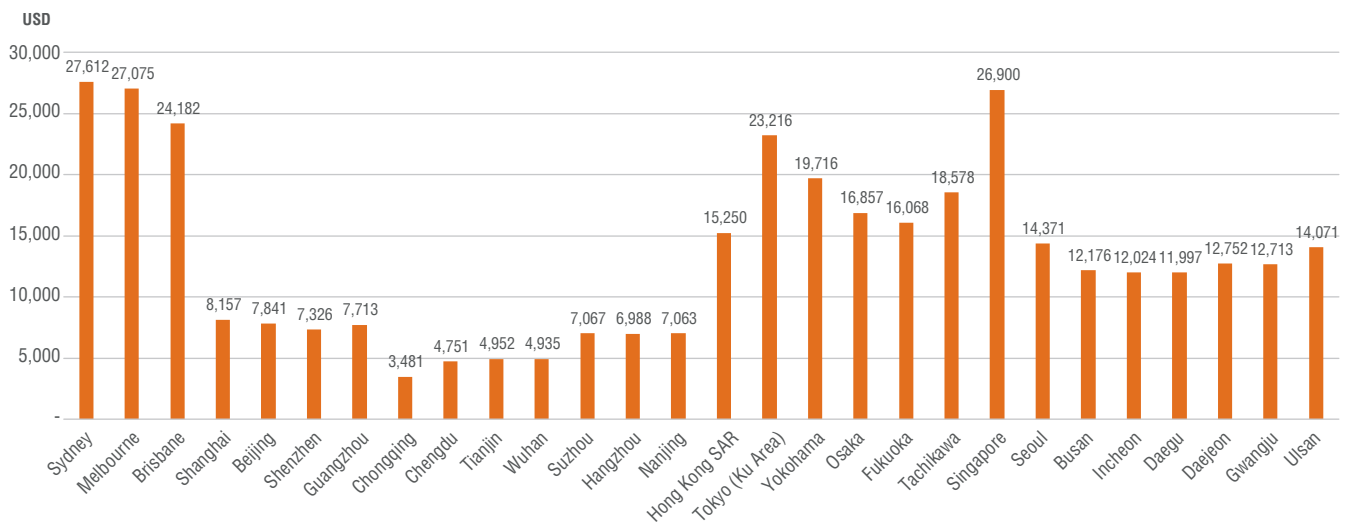
FIGURE A1 Median Annual Household Income



Notes:

1. Countries are arranged in alphabetic order. Cities within the same country are arranged by urban population size
2. Income data in Australia are in 2019-2020
3. Median household income data for China, Japan and South Korea are calculated using the average household income and GINI coefficients. In the case of Chinese cities, we are applying a factor of 1.3567, which is the average of the average household income to median income ratios of Singapore and Australia (China's GINI coefficient is between Singapore and Australia)
4. Income data in China and South Korea are in 2020
5. Income data in Japan are in 2019
6. Income data in Singapore and Hong Kong are in 2021

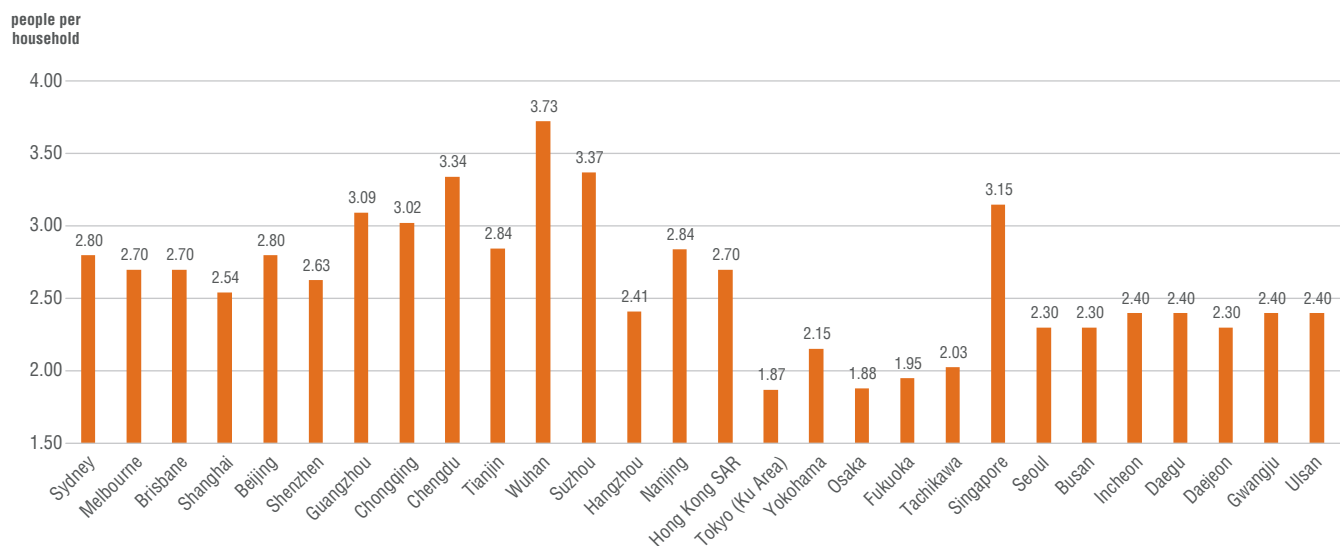
FIGURE A2 Median per Capita Income



Notes:

1. Median per capita income is median household income divided by average household size

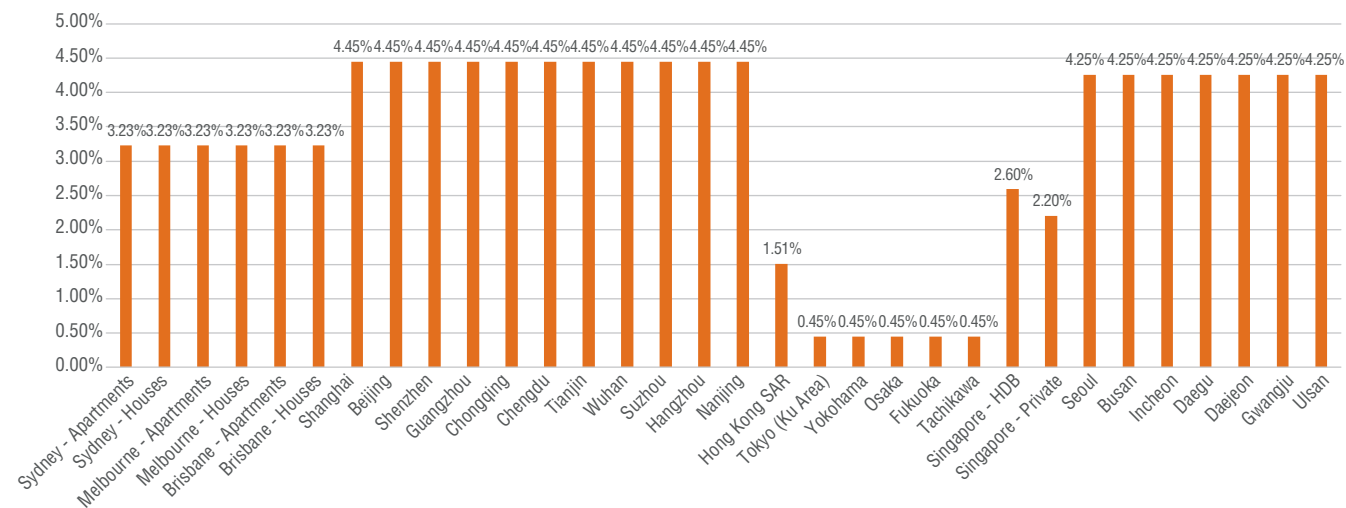
FIGURE A3 Average Household Size



Notes:

1. Australian cities are 2016 Census data
2. Singapore and Hong Kong are 2021 data
3. Other cities are 2020 data

FIGURE A4 Mortgage Interest Rate (Floating)



Notes:

1. For Singapore, the buyers of HDB flats usually opt to choose HDB loans, the interest rate of which is higher compared with commercial lenders, but is fixed and there is no penalty for early payment

FIGURE A5 Monthly Mortgage Payment for Median-Priced Home Assuming Legal Minimum Downpayment and 30-Year Mortgage

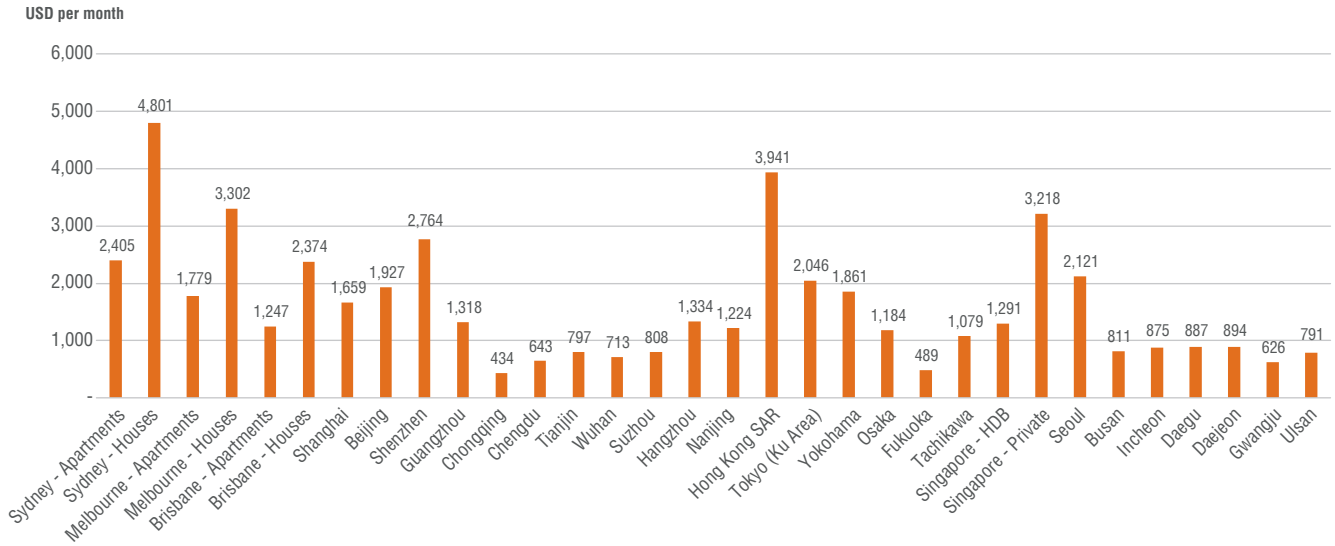


FIGURE A6 Monthly Mortgage Payment as Percentage of Median Monthly Household Income (Assuming Legal Minimum Downpayment and 30-Year Mortgage)

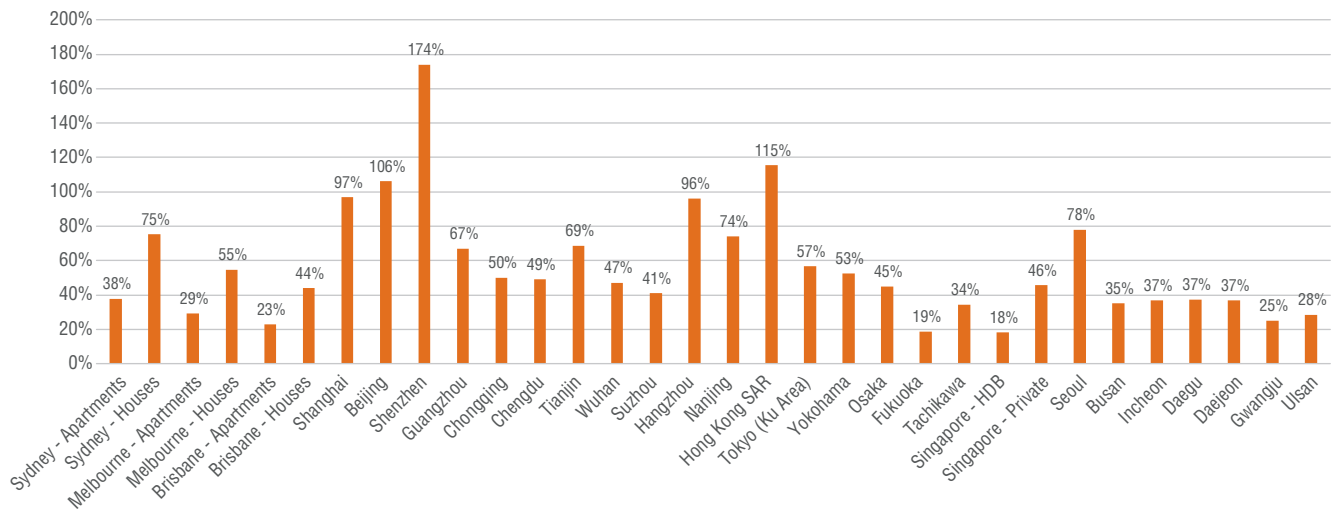
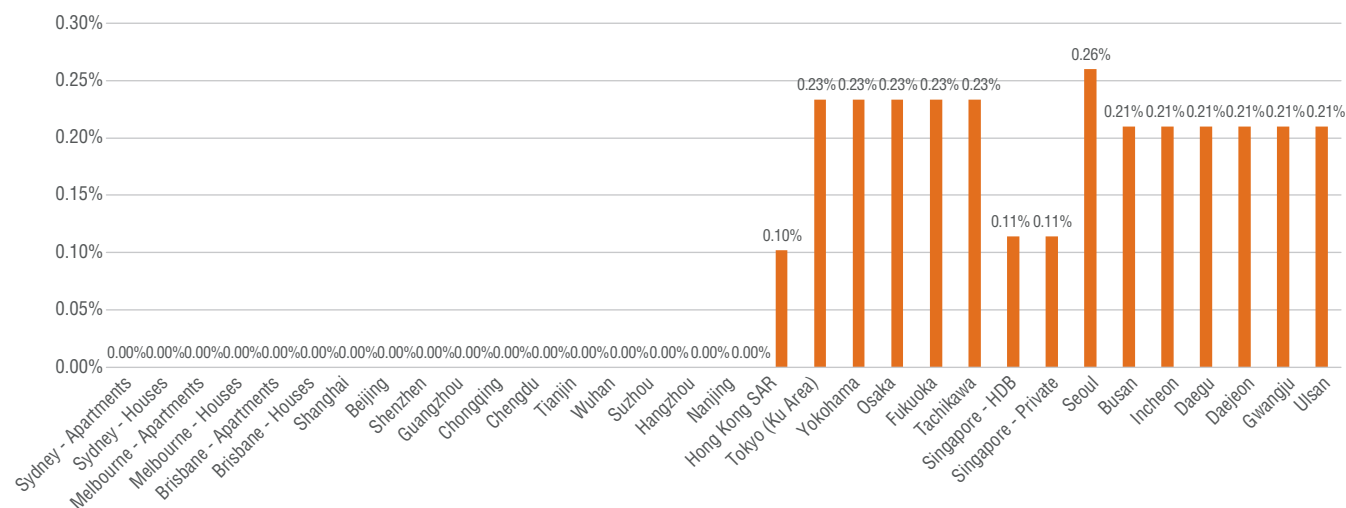


FIGURE A7 Annual Property Tax as Percentage of Property Value (Home Purchase Price)



Notes:

1. In Australia, there is no property tax. However, local governments charge land tax if the property owner owns investment properties, including residential rental properties, commercial properties, holiday homes and vacant land
2. Though Shanghai and Chongqing in mainland China has adopted property tax initiatives since 2011, the impact on first-home buyers is zero due to exempt programs.
3. In Hong Kong, property tax are charged for owner-occupiers (5% of the hypothetical annual rent)
4. In Japan, property tax is comprised of property tax and city urban planning tax, a total of 1.7% of assessed property value (about 70% of the market value). However, for home size below 200 sqm, both taxes get sharp discounts (home owners only pay 1/6 of property tax and 1/3 of city urban planning tax)
5. In Singapore, property tax for owner-occupiers are levied based on the hypothetical annual rent (0-16% depending on the annual rent amount)

FIGURE A8 Monthly Mortgage Paybacks and Property Tax as Percentage of Median Household Income (Assuming Legal Minimum Downpayment and 30-Year Mortgage)

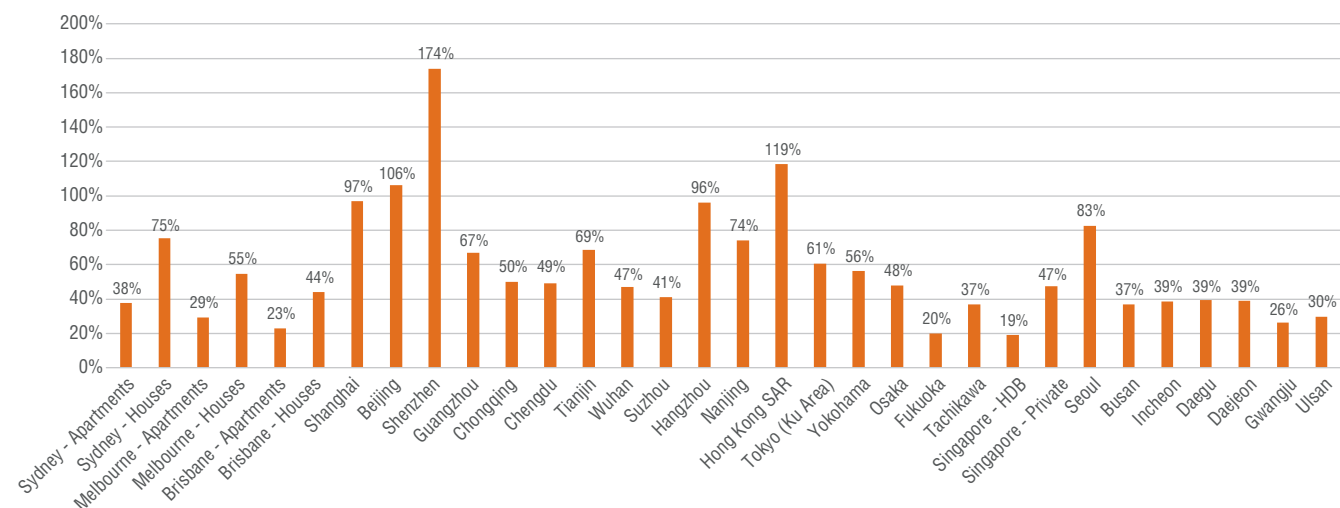
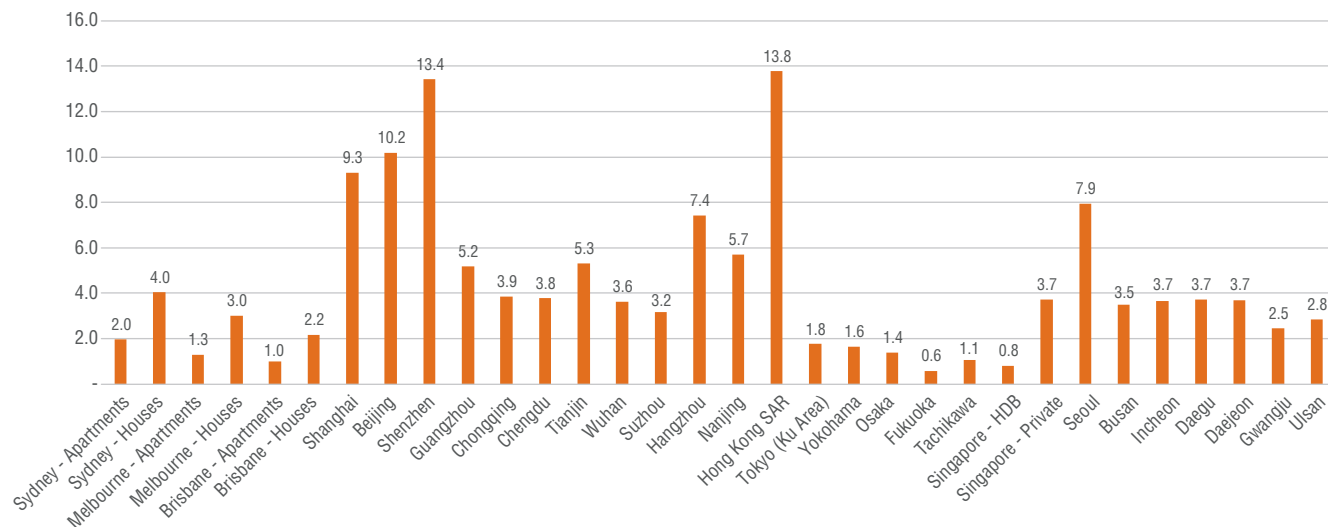


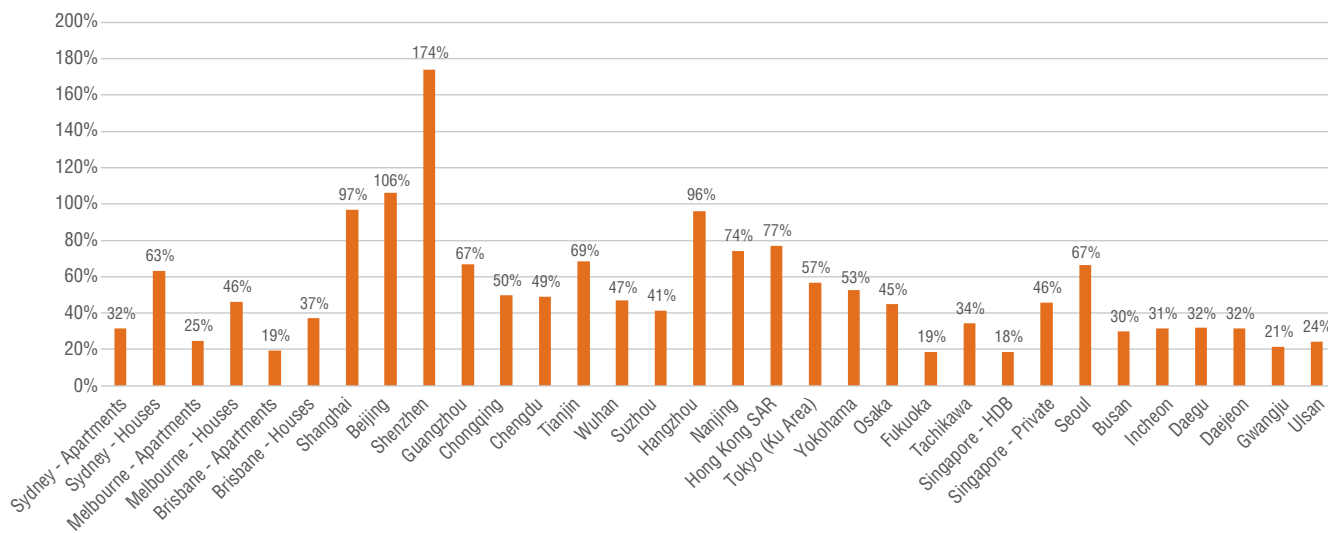
FIGURE A9 Years of Median Household Income to Save Typical Minimum Downpayment and Other Upfront Costs for Home Purchase



Notes:

1. Other upfront costs including transaction costs that are borne by buyers (purchase tax, lenders mortgage insurance, brokerage fees)
2. In Japan, transaction costs borne by buyers can also be financed from commercial lenders, as such, the upfront financial burden for owning housing is alleviated

FIGURE A10 Monthly Mortgage Payment as Percentage of Median Monthly Household Income (Assuming Typical Minimum Downpayment and 30-Year Mortgage)



Notes:

1. For Singapore, the buyers of HDB flats usually opt to choose HDB loans, the interest rate of which is higher compared with commercial lenders, but is fixed and there is no penalty for early payment

FIGURE A11 Monthly Mortgage Paybacks and Property Tax as Percentage of Median Household Income (Assuming Typical Minimum Downpayment and 30-Year Mortgage)

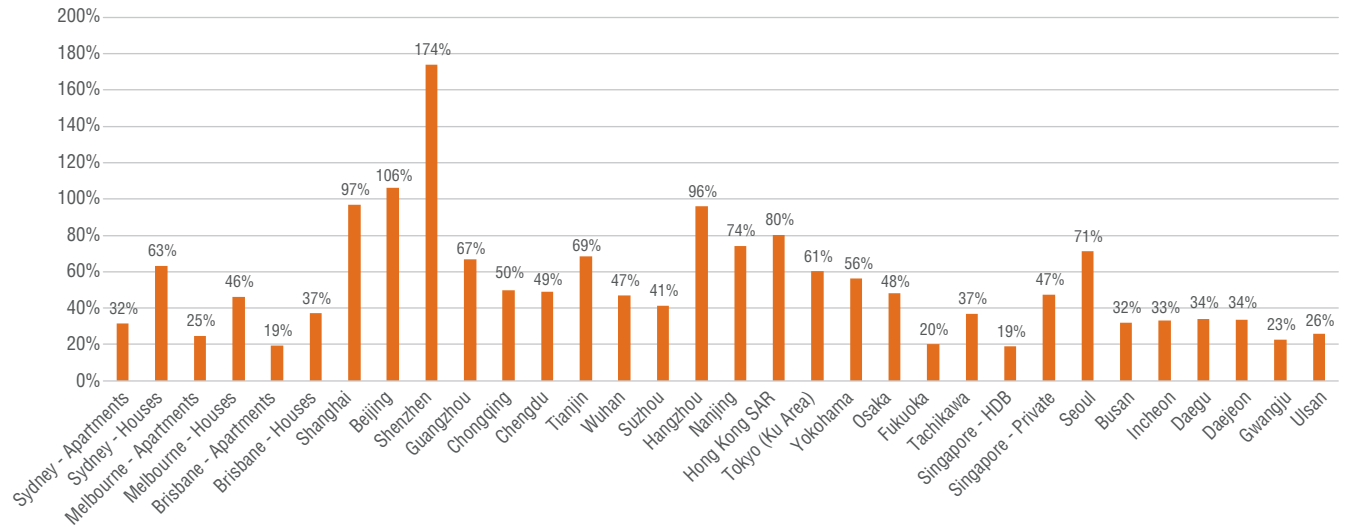
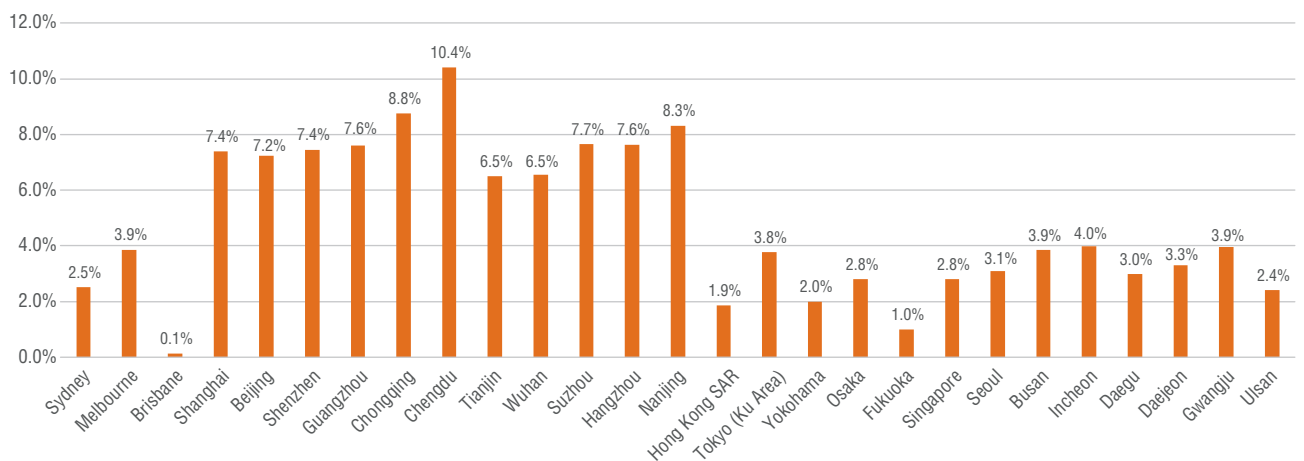


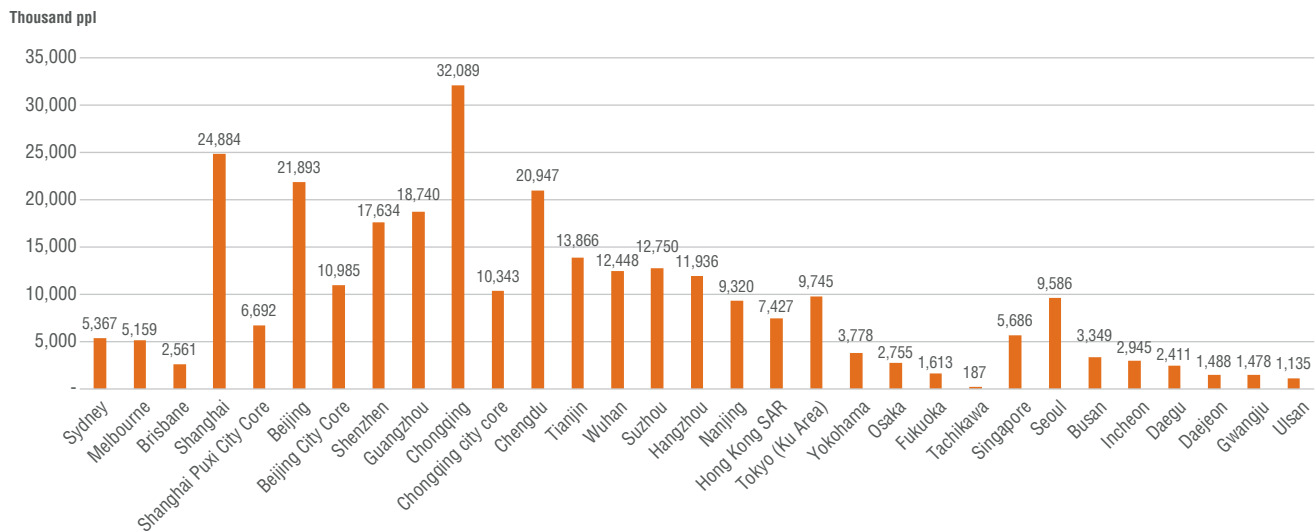
FIGURE A12 2016–2020 Median/Average Income CAGR



Notes:

1. Australian cities: median household gross income, 2015/2016 – 2019/2020 CAGR
2. Chinese cities: per capita disposable income
3. Hong Kong: annualized median household income
4. Japanese cities: real income data from annual sample family income and expenditure survey conducted by the Statistics Bureau of Japan. Tachikawa is not covered
5. Singapore: annualized household income from work per household member (including employer CPF contributions)
6. South Korea: per capita disposable income

FIGURE A13 Population at the End of 2020



Notes:

1. Chinese cities: permanent residents
2. Beijing City Core includes Dongchen District, Xicheng District, Chaoyang District, Haidian District, Shijingshan District and Fengtai District
3. Shanghai Puxi City Core includes Huangpu District, Xuhui District, JingAn District, Changning District, Yangpu District, Hongkou District and Putuo District
4. Chongqing City Core includes Yuzhong District, Dadukou District, Jiangbei District, Shapingba District, Jiulongpo District, NanAn District, Beibei District, Yubei District and BaNan District
5. Singapore: total population

FIGURE A14 Population CAGR (2015–2020)

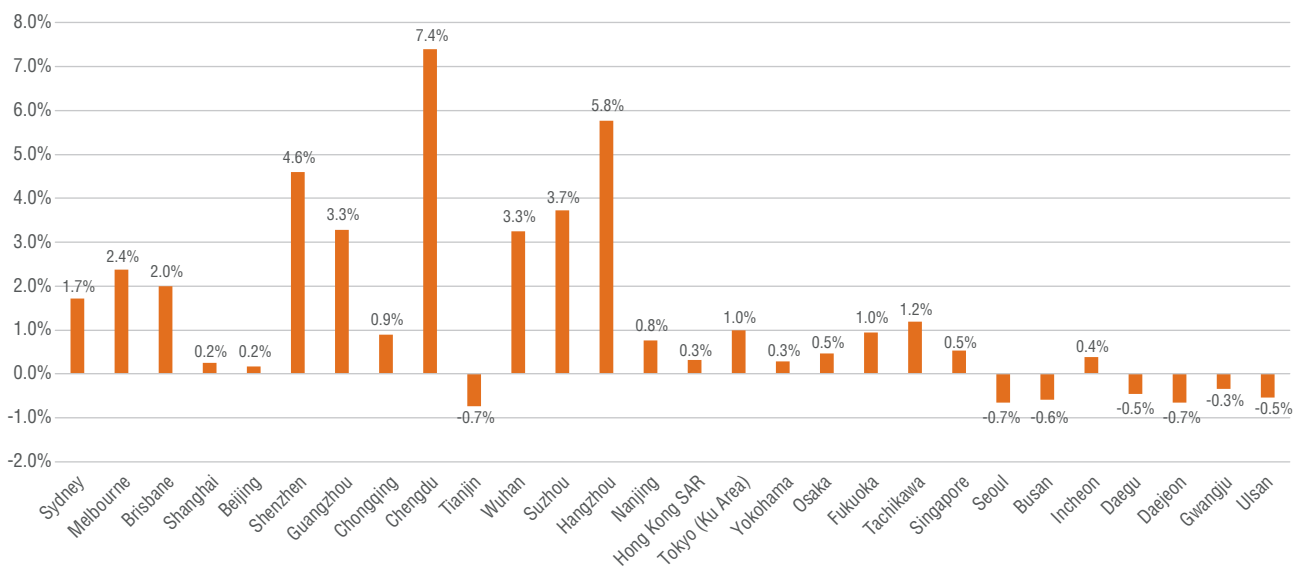
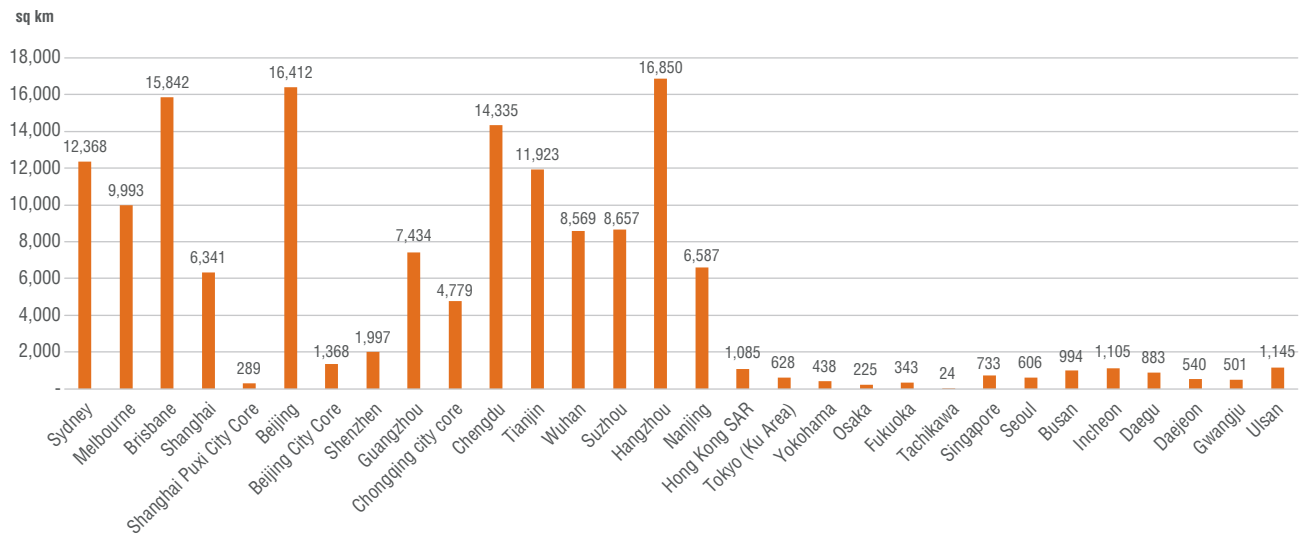


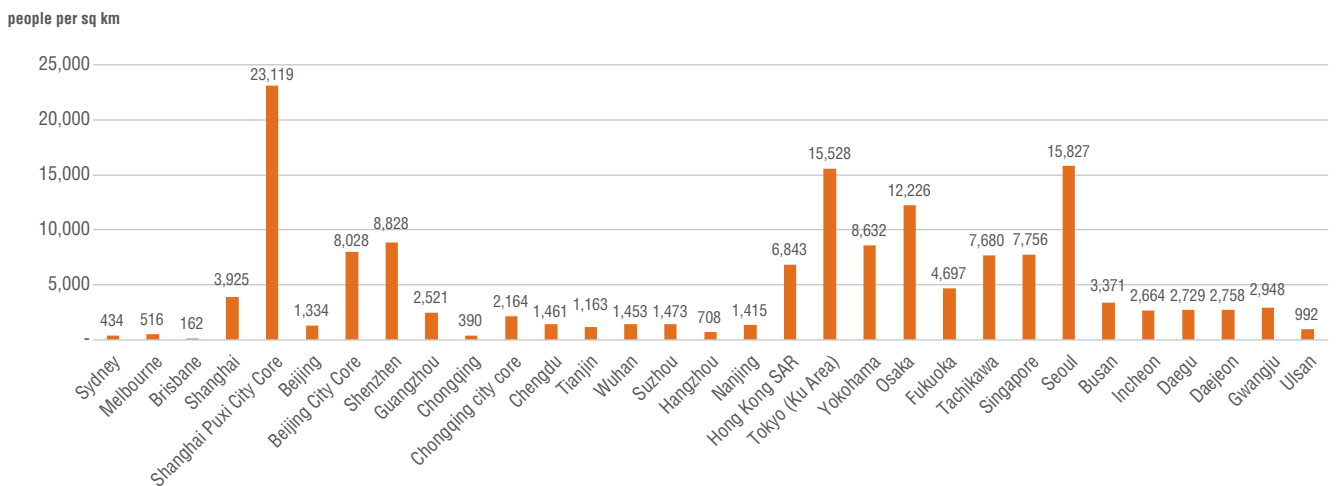
FIGURE A15 Land Area as of 2020



Notes:

1. Chongqing's land area is 82,370 square kilometer
2. Beijing City Core includes Dongchen District, Xicheng District, Chaoyang District, Haidian District, Shijingshan District and Fengtai District
3. Shanghai Puxi City Core includes Huangpu District, Xuhui District, JingAn District, Changning District, Yangpu District, Hongkou District and Putuo District
4. Chongqing City Core includes Yuzhong District, Dadukou District, Jiangbei District, Shapingba District, Jiulongpo District, NanAn District, Beibei District, Yubei District and BaNan District

FIGURE A16 Population Density in 2020 (Total Population Divided by Total Area of Jurisdiction)



Notes:

1. The population density data in this chart are calculated by dividing the total population by the total area of the corresponding jurisdictions
2. Beijing City Core includes Dongchen District, Xicheng District, Chaoyang District, Haidian District, Shijingshan District and Fengtai District
3. Shanghai Puxi City Core includes Huangpu District, Xuhui District, JingAn District, Changning District, Yangpu District, Hongkou District and Putuo District
4. Chongqing City Core includes Yuzhong District, Dadukou District, Jiangbei District, Shapingba District, Jiulongpo District, NanAn District, Beibei District, Yubei District and BaNan District

Data Sources

| | Population and land | Homeownership | Household income | GINI coefficient (income) | Housing price | Owner-occupier home size | Rent | Rental home size | Downpayment requirement | Mortgage rate | Purchase fees and property tax |
|--------------------|---|---|---|---------------------------|--|--|--|--|--|---|--|
| Australia | Australian Bureau of Statistics | Australian Bureau of Statistics | Median gross household weekly income for capital cities Australian Bureau of Statistics | n.a. | Median prices for houses and apartments Domain | 80% of average sizes of newly built houses and apartments in NSW, VIC, and QSL (2020/21) CommSec | Median weekly rents for houses and apartments Domain | 64% of average sizes of newly built houses and apartments in NSW, VIC, and QSL (2020/21) CommSec | ANZ Australian Housing and Urban Research Institute | Ratecity CommBank | Revenue NSW State Revenue Office Victoria Queensland Government whichrealestateagent.com.au |
| China | National Statistics Bureau; statistics bureau of each city | Joint study by Tsinghua University and Zhejiang University in 2012 | Per capita disposable income times average household size National Statistics Bureau | OECD | Average selling price (new commodity residential) National Statistics Bureau | 90 sq m gross floor area times 80% floor efficiency Academic papers | Average monthly rent per sq m CRTYRE DATA | 43.2 sq m (60% of 72 sq m usable area) | Housing and Urban-Rural Development Commission of each city | The People's Bank of China | Provincial Tax Service, State Taxation Administration Bendibao |
| Hong Kong | Census and Statistics Department | Census and Statistics Department | Median household income General Household Survey Census and Statistics Department | n.a. | Total considerations and total number of residential transactions (both primary and resale), housing price per sq m and housing stock by district and size Rating and Valuation Department The Land Registry | Median floor area of accommodation of domestic households, private owner-occupier housing 2016 Population By-census Census and Statistics Department | Average monthly rent and housing stock by district and size Rating and Valuation Department | Median floor area of accommodation of domestic households, private rental housing 2016 Population By-census Census and Statistics Department | Hong Kong Monetary Authority | Hong Kong Monetary Authority | PwC Hong Kong PlaceProperty |
| Japan | Ratios between the number of owner-occupied houses and the total number of houses Statistics Bureau of Japan | Ratios between the number of owner-occupied houses and the total number of houses Statistics Bureau of Japan | Per capita disposable income times average household size Statistics Bureau of Japan | OECD | Average selling price (condo) Real Estate Economic Institute Hitotsubashi University, Shimizu Laboratory | Average home size of condo transaction in 2021 (Tokyo-Ku and Osaka) Real Estate Economic Institute Area of floor space per owned dwelling (Yokohama, Fukuoka, and Tachikawa) Statistics Bureau of Japan | Monthly rent per dwelling Statistics Bureau of Japan | Area of floor area per rented dwelling Statistics Bureau of Japan | Hitotsubashi University, Shimizu Laboratory | Hitotsubashi University, Shimizu Laboratory | Hitotsubashi University, Shimizu Laboratory |
| Singapore | Singapore Department of Statistics | Singapore Department of Statistics | Median household income Singapore Department of Statistics | n.a. | Median selling price (private resale) Urban Redevelopment Authority Average selling price (HDB resale flat) Housing and Development Board | Median home size (private resale) Urban Redevelopment Authority Average home size (HDB resale flat) Housing and Development Board | Median monthly rent for 2-bedroom (private) Urban Redevelopment Authority | Assuming 72 sq m for 2-bedroom rental apartments | Urban Redevelopment Authority, Housing and Development Board | PropertyGuru, Housing and Development Board | Inland Revenue Authority of Singapore, PropertyGuru |
| South Korea | Statistical Information Service | Korean Statistical Information Service | Per capita disposable income times average household size Korean Statistical Information Service | OECD | Median housing price Korea Real Estate Board | Median home size Korea Real Estate Board | Median monthly rent price Korea Real Estate Board | 80% of residential size per household Korean Statistical Information Service | Financial Services Commission, Republic of Korea Korean Housing Finance Corporation | Bank of Korea <i>The Korean Times</i> | Taxwatch Prian.info |

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