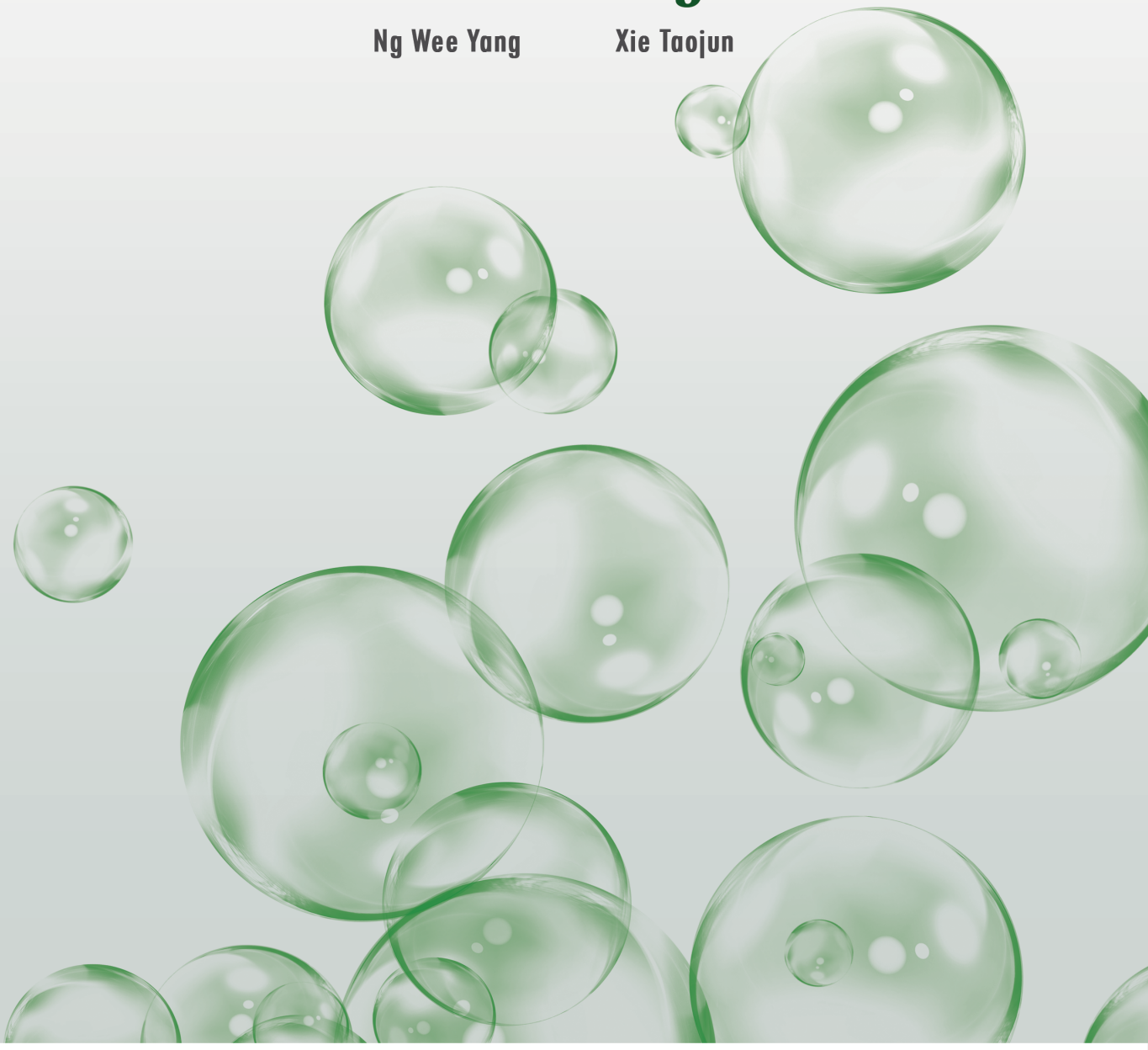
2022 Annual Indices for Expatriates and Ordinary Residents on

Cost of Living, Wages and Purchasing Power for World's Major Cities

Ng Wee Yang Xie Taojun



Lee Kuan Yew School of Public Policy
Asia Competitiveness Institute

NUS National University of Singapore

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About ACI

The Asia Competitiveness Institute (ACI) was established in August 2006 as a research centre at the Lee Kuan Yew School of Public Policy (LKYSPP), National University of Singapore (NUS). It aims to build intellectual leadership and network for understanding and developing competitiveness and sustainable growth in Asia. ACI seeks to contribute to the enhancement of inclusive growth, living standards, and institutional governance through competitiveness research on sub-national economies in Asia. It identifies mitigating issues and challenges for potential public policy interventions through close collaboration with regional governments, business corporations, policy think tanks, and academics. ACI's three key research pillars include (i) sub-national economies level competitiveness analysis, (ii) emerging sustainable development landscape in 16 Asia economies, and (iii) Asia's long-term growth strategies and public policy analysis.

ACI's value propositions may be encapsulated in its acronym:
Analytical inputs to initiate policies for policy-makers and business leaders in Asia
Capacity building to enable others through improvement in productivity and efficiency
Intellectual leadership to create pragmatic models of competitiveness and inclusive growth

Vision and Mission

- ACI's over-arching vision is to build up its research credibility with policy impact, contributing as a professional, world-class think-tank.
- ACI's mission is to establish our niche as a leading policy think-tank by identifying development trends, opportunities, and challenges among Asian economies and business corporations.
- ACI endeavours to articulate sound recommendations, promote discussion, and shape research agenda in the arena of public policy amongst Asian governments.
- ACI undertakes evidence-based analysis of public policy issues and decisions, in order to provide assessment of their effectiveness as well as economic and societal impact

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Foreword

The Annual Indices for Expatriates and Ordinary Residents on Cost of Living, Wages and Purchasing Power for World's Major Cities is one of the flagship projects conducted by ACI. First started in 2014, the institute has been constructing annual indices and rankings at the city level dating back to 2005. In this edition, we report the indices and rankings from 2005 to 2020.

As a result of urbanisation and globalisation, global competition among cities as economic growth centres has become progressively intense. The competition is likely to intensify as the world becomes increasingly interconnected. Consequently, international benchmarks of cities are vital for policy analysis. Specifically, cost of living, wages and purchasing power are fundamental indicators of interest as they track the living conditions of urban dwellers. Amid socio-economic uncertainties, policymakers need to obtain accurate and timely estimates of ordinary residents' cost of living and purchasing power to facilitate the design and implementation of appropriate policies. Against this background, this annual study analyses the cost of living, wages and purchasing power for expatriates and ordinary residents across 104 major cities in the world. In this edition, we find that New York, Zurich, Los Angeles, Geneva, and Hong Kong continue to be the top five cities in the ranking for expatriates' living costs. Whereas, for the ordinary residents' living costs, the top five cities are New York, Zurich, Los Angeles, Geneva, and Sydney.

This report is a useful reference for multinational corporations, human resources managers, as well as for policymakers, researchers and analysts, who are concerned with standards of living and quality of life of urban dwellers. I am confident that the insights shared in this publication will enable each city to better its urban conditions.

Professor Paul Cheung
Director, ACI
Lee Kuan Yew School of Public Policy
National University of Singapore

1 Introduction to Cost of Living, Wages and Purchasing Power for Expatriates and Ordinary Residents

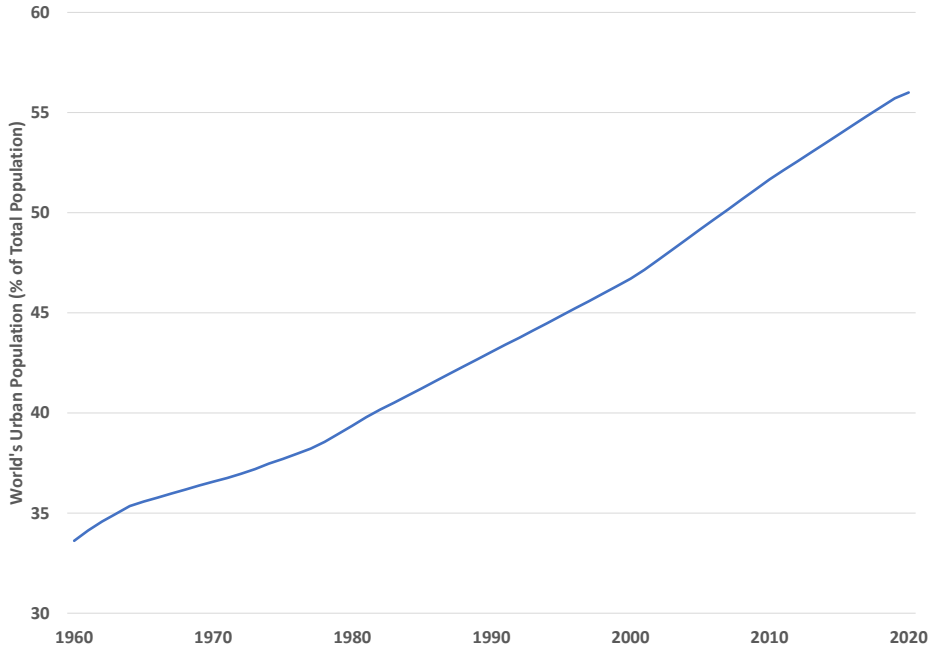
1.1 Background and Research Motivation

Urbanisation and globalisation are two major forces shaping the world economy. Data from the World Bank, as shown in Figure 1.1, exhibit an upward trend in the percentage of the world's urban population. Since 2007, more than half of the world's population has lived in urban areas. In addition, the World Bank predicts that by 2045, the number of people living in cities will increase to six billion, which is an increase of almost two billion from today. By 2050, the proportion of people living in cities will have increased to a staggering 68% of the world's population (World Bank, 2018).

Such a trend implies that more and more economic activities are now being shifted towards the cities. Cities have become the main drivers of economic growth; some megacities are now able to even rival whole countries in economic performance. In 2014, a study conducted by Oxford Economics, argued that the world's 750 biggest cities accounted for approximately 57% of global Gross Domestic Product (GDP). They predict that by the year 2030, this number will further increase to more than 60% of the total world GDP (Oxford Economics, 2014).

Although globalisation has existed for centuries, the rapid advancement of technology in recent decades has amplified its effects. Technological advancements, particularly in areas such as communication and transportation, have brought economies around the world closer together by facilitating greater mobility for both businesses and people. Economies are now increasingly interconnected and interdependent. While businesses have traditionally had to manufacture entire products in one country or city, they are now able to optimise their profits by decentralising and dispersing their production network to various parts of the world and building Global Value Chains (GVCs), a phenomenon unprecedented in human history.

The increasing urban population translates into opportunities for Multinational Corporations (MNCs). At the same time, countries and cities that can be part of the global value chain will be able to reap the potential economic benefits it brings. In the



Source: World Bank
Figure 1.1: Share of the World's Urban Population With Respect to Total Population (1960 - 2020).

hope of attracting and retaining these MNCs, cities, the primary driver for economic growth, will now have to compete with each other both nationally and internationally. This competition among cities is likely to intensify as MNCs seek to shorten their GVCs production length in response to the rising tide of protectionism (World Bank, 2018) and in the aftermath of the ongoing global COVID-19 pandemic.

Against the backdrop of urbanisation and globalisation, studies on cities, particularly the cost of living, wages and purchasing power, have garnered attention in recent years. Cost of living, which measures the level of expenses required to sustain a certain level of living, is often an important consideration for MNCs and expatriates looking to relocate. Beyond the cost of living, purchasing power, which is a combination of both the cost of living and wages, also provides a form of measurement for residents' well-being and standard of living. High cost of living and low purchasing power could bring about widespread social and economic problems. Hong Kong and various cities in Western Europe are great examples as the recent violent protests and social unrest can be attributed partly to their consistently high cost of living and declining purchasing power (Tan et al., 2019, 2020). Studying the cost of living, wages and purchasing power is therefore essential for policymakers, MNCs and academics around the world.

For policymakers, such studies will provide an accurate overview of the current

living conditions of ordinary residents and of the areas for improvement going forward. Ordinary residents are often concerned whether their wages can keep pace with the rising cost of living, especially in areas such as housing, transport, education and healthcare. A study of cities, will provide policymakers with an indicator whether such concerns are met.

MNCs will benefit as such studies help them optimise their profits by forecasting the potential costs required to set up an operation in a particular city. In addition, the study of the cost of living for expatriates, together with the study on the cost of living, wages and purchasing power for ordinary residents in a particular city, will provide MNCs with the information required to decide how best to deploy their human resources around the world. Meanwhile, policymakers will also be able to observe their city's competitiveness relative to other cities and tailor their policies accordingly.

For academics, a separate and comprehensive study for both expatriates and ordinary residents will open up more options for their research. Among the many studies on the cost of living for expatriates, this study aims to provide a more rigorous approach. The commercial cost of living surveys such as those published by Economist Intelligence Unit (EIU), Mercer and the Union Bank of Switzerland (UBS) are useful only as references to calculate compensation packages for expatriates and are, therefore, inadequate for guiding policy analysis. On the other hand, this study aims to conduct a comprehensive study for the cost of living, wages and purchasing power of ordinary residents, the first of its kind.

Consumption patterns of expatriates are likely to differ from those of ordinary residents. Therefore, policy analysis with regards to the general cost of living, using findings and data solely for expatriates, will not be appropriate or accurate. Similarly, while the consumer price index (CPI) may serve as a measure of the cost of living at the national level, there is no reliable index which tracks the cost of living at the city level. More details with regards to this will be discussed in our literature review in Section 1.2.

1.2 Literature Review

The theoretical basis of the cost of living index goes back as far as Konus (1939). Pollak (1989); Diewert and Nakamura (1993) and Triplett (2001) also provided useful reviews of the methodological issues surrounding cost of living indices. As defined by Triplett (2001), the cost of living index is a price index that measures the change in consumption costs required to maintain a constant standard of living. The index may include the costs of all variables that affect the standard of living, or it may be conditional on some variables that are kept constant for the construction of the index. Economists may substitute "standard of living" in the above definition for other terms such as "constant utility", or as in Blackorby and Russell (1978), the same "indifference surface".

At the national level, national statistical agencies may construct the CPI as a cost of living index though interestingly, this is not always the case. Triplett (2001) told us that while certain countries such as the United States conceptualised the CPI as an indicator reflecting households' cost of living, others drew a sharp distinction between the two. The second position follows from Hill (1998) who argued that the CPI, as an index for measuring inflation, was only designed to capture changes in the value of a fixed basket of goods and services of fixed weightage over time.

Hill (1998) distinguished this from a cost of living index, which measures differences in value between baskets of goods and services necessary for the consumer to maintain constant utility over time. These baskets might be different from one another, with different weights for the items in the baskets. However, despite the conceptual debate among segments of academia, the public, the media, and politicians and even academics have long taken to using CPI as a summary measure for the cost of living at the national level.

On the other hand, internationally comparable indices on the cost of living and purchasing power at the city level are often published by commercial research houses. These surveys receive much public attention and often generate emotional reactions, especially in cities ranked among the most expensive. Major commercial studies include the following:

- The UBS Prices and Earnings report, which is published once every three years by the Wealth Management Department of UBS. The report offers indices on the price level for expatriates. Gross hourly wages data and purchasing power index and ranking are also available. The basket of goods and services used to calculate the price indices reflects the consumption patterns of a European family of three and the basket is assumed to be shared across all cities.

- The EIU Worldwide Cost of Living study, which is updated annually and provides cost of living indices and rankings for expatriates. The study is based on a single set of international weights for goods and services typically used by international businessmen. New York is the base city in this study, and the cost of living in other cities is benchmarked against it.

- The Mercer annual Cost of Living Survey, which is now in its 28^{th} edition. Mercer publishes only the ranking of cities according to the cost of living for expatriates and does not provide any index value.

These commercial reports are designed to aid human resources managers at MNCs in formulating appropriate compensation policies for expatriate employees on international assignments. Thus, they cannot be used for policy analysis concerning ordinary urban dwellers. This is because expatriates tend to have Western consumption patterns geared towards high-end and lifestyle products and it is unlikely that ordinary residents would have the same consumption preferences.

Furthermore, in the case of expatriates, it is sensible to assume, as all the commercial reports reviewed above tend to do, a common consumption pattern due to the social settings associated with the nature of expatriates' work as foreign white-collar experts. However, this assumption does not hold for ordinary residents, whose consumption patterns vary according to their geographical location, social values and cultural affiliations. As a result, drawing a conclusion about a "general" cost of living level based on commercial research risks significantly overstating the actual cost of living for ordinary residents.

Commercial studies may also suffer from serious methodological weaknesses and data inaccuracies. For instance, as pointed out by Tan and Luu (2016), there were considerable discrepancies in the data used in the 2009 UBS *Prices and Earnings* report which overstated the cost of living in Singapore, even for expatriates. In that report, the prices for home electronics and household appliances in Singapore were above that in Mumbai, which was counterintuitive, as Indian visitors tend to spend twice as much on electronics as the average tourist in Singapore (Singapore Tourism Board, 2013). As regards to dining out, the 2009 UBS report put Singapore's price level slightly above that of many Western European cities, including Paris, even though the latter are known for their expensive restaurant meals.

More importantly, the same study made some simplistic assumptions in calculating its reported indices and rankings. These assumptions can be problematic. UBS, for instance, used a common occupation profile, based on global averages, to derive the average wage in each city.

This occupation profile severely understated the percentage of Professionals, Managers, Executives and Technicians (PMETs) and overstated the share of Productions,Transportation Operators and General Labours (PTOGLs) and Clericals, Sales and Service Workers (CSRWs) in Singapore. The percentage of PMETs assumed by UBS in the 2009 report, which was made available upon request, was 9%. This was much lower than Singapore's actual percentage of 52% as reported by Singapore's Ministry of Manpower. Meanwhile, Singapore residents' share of PTOGLs and CSRWs in 2009 were both at 24%, lower than UBS' assumed figures of 58% and 33% respectively. Due to these mismatches, the 2009 UBS report understated the average wage levels in Singapore.[1] The net result is that, When divided by the UBS' cost of living index, which overstated the true cost of living in Singapore, purchasing power in the city-state was severely understated.[2]

The UBS research is not the only commercial study fraught with methodological problems. We also suspect that the cost of living ranking reported in the annual EIU

[1]The UBS also appeared to have excluded contributions to the Central Provident Fund (CPF)– Singapore's defined contribution social security system – from their calculation of wages. This exacerbated the understatement of wages in Singapore because CPF contributions are also used extensively for housing, medical and educational expenses prior to retirement. Hence, they should be treated as part of wages. See Tan and Luu (2016) for a detailed discussion.

[2]Tan and Vu (2011) revised the 2009 UBS estimates for Singapore using appropriate methodologies and data. They found significant differences from the original results.

Worldwide Cost of Living survey is sensitive to the choice of the base city. This means that the ranking results would change if EIU used Tokyo or London instead of New York as the benchmark city to compute their cost of living index. The sensitivity of the ranking results to the choice of the base city means that the research results are not consistent. This fact calls into question the rigour of the research.

The discussion above serves to highlight that it is not advisable to use commercial research reports for purposes other than their intended role as references to design expatriates' compensation packages. In fact, given the prevalence of methodological and data problems in these studies, one should exercise caution even when using them for making inferences about expatriates' cost of living. Meanwhile, the existing academic literature has not adequately addressed the issue of measuring the cost of living at city level. This is a gap that the Asia Competitiveness Institute (ACI) aims to fill with our research.

1.3 Factors which Affect the Cost of Living, Wages and Purchasing Power for Expatriates and Ordinary Residents

Obtaining reliable international benchmarks on the cost of living, wages and purchasing power is necessary as they facilitate meaningful analysis into issues affecting expatriates and ordinary urban dwellers. With this objective, the ACI at the Lee Kuan Yew School of Public Policy (LKYSPP), National University of Singapore (NUS) has developed comprehensive indices which systematically track cost of living for expatriates as well as cost of living, wages and purchasing power for ordinary residents across the world's major cities since 2005. Previous editions of the study published in 2014 and 2016 covered 103 global cities (see Tan et al. (2016) and Tan et al. (2017)). From the 2017 edition onwards, the sample was extended to include two Vietnamese cities, namely Hanoi and Ho Chi Minh City, bringing the total cities studied to 105 (Tan et al., 2018). We estimated the ranking results for Hanoi and Ho Chi Minh City from 2013 onwards. However, we have dropped Caracas from our annual analysis since 2019, due to its ongoing hyperinflation.

This section summarises some important insights which can be gained from examining our indices. These include the geographical distribution of cities according to their cost of living for ordinary residents and cost of living for expatriates; the sensitivity of the cost of living ranking to exchange rate fluctuations and the relationships between the cost of living, purchasing power and liveability of cities.

1.3.1 Geographical Distribution of Cities based on the Cost of Living for Expatriates, Cost of Living for Ordinary Residents and Purchasing Power for Ordinary Residents

From our research, we observed that cities in developed regions tend to have a higher cost of living for ordinary residents than cities in developing regions. On the other hand, there is no consistent pattern in the geographical distribution of the cities according to their cost of living for expatriates. This means that ordinary residents of an Asian city like Seoul are likely to face a lower cost of living than their counterparts in a Western European city like Paris. However, it is not possible to make any *a priori* conjecture about how the cost of living for expatriates in the former may compare with that in the latter.

Figures 1.2 and 1.3 illustrate the geographical distribution of the 104 cities we have studied according to their cost of living for ordinary residents and expatriates, respectively. The figures reflect the latest index results, which are based on 2020 data. In both figures, the longer the bar, the higher the cost of living index value and hence the more expensive the city for ordinary residents and expatriates, respectively.

We found that cities in Western Europe, Australasia and North America were relatively expensive for ordinary residents in 2020. In contrast, African, Asian, Eastern European and South American cities were cheaper for ordinary residents (see Figure 1.2). However, there are exceptions. Tel Aviv's cost of living is more expensive than Washington DC; Tokyo is more expensive than Brisbane and Osaka-Kobe had a higher cost of living than Lexington.

In contrast, Figure 1.3 shows no discernible pattern in the distribution of cities according to the cost of living for expatriates.

Cities in developed regions are more expensive for ordinary residents than cities in the developing region due to differences in the cost structure of non-traded goods and services among these cities. In particular, locally provided services which are non-traded either form an integral part of ordinary residents' consumption baskets or go into the local production and provision of other goods consumed by ordinary residents. These services, by nature, are labour-intensive and labour cost in Western Europe, Australasia and North America is significantly higher than in Africa, Asia, Eastern Europe and South America.

For instance, the average gross hourly wage in all Western European cities in our study in 2020 was 26.60 USD as compared to 7.70 USD for Asian cities. Such wage differentials lead to higher prices for products and services, which in turn result in a higher overall cost of living for ordinary residents in developed cities. It should be noted, however, that owing to higher wages, ordinary residents' purchasing power in the developed region is also generally higher than their counterparts elsewhere in the world.

However, as can be seen from Figure 1.2, Tel Aviv, Tokyo, Osaka-Kobe, Hong Kong, and Singapore are outliers in their respective regions, as their labour costs are

more reflective of cities in more developed regions. The reason is that these cities are at a similar development stage as the developed cities and therefore have similar levels of labour productivity.

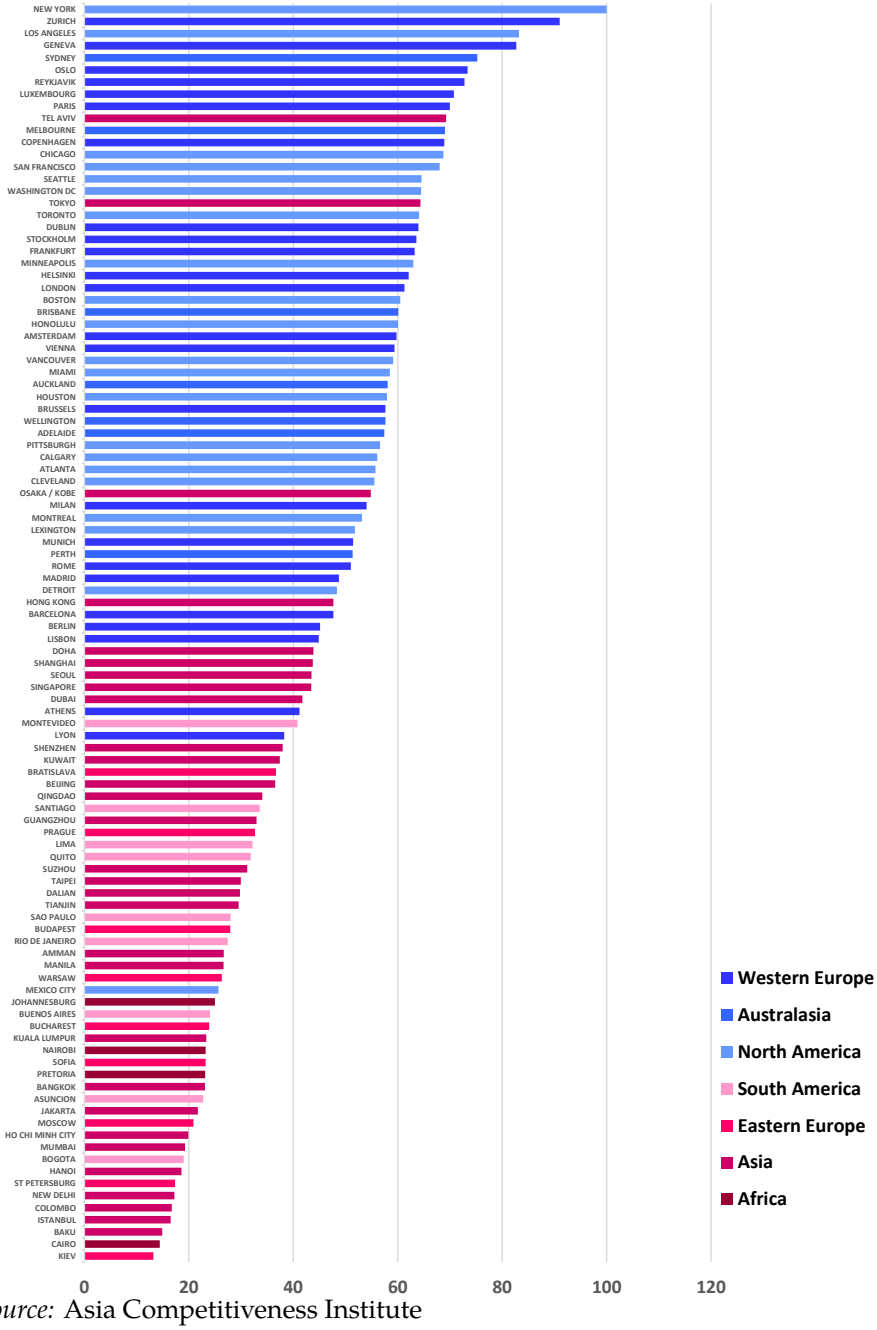
At the same time, expatriates everywhere are geared towards high-end imports and lifestyle products. As such, their cost of living is mainly affected by exchange rate fluctuations and other factors driving the costs of trade rather than local factors. This explains the lack of pattern in the geographical distribution of cities, according to the cost of living for expatriates.

These findings again underscore the importance of distinguishing the analysis on expatriates and ordinary residents; conflating the latter with the former risks overstating ordinary residents' cost of living in developing countries, especially in Asia. In addition, the findings imply that Western expatriates posted to Asia and other regions outside the Western world will benefit, if they adopt the consumption patterns of ordinary residents in the cities.

From our research, we have also observed that cities in developed regions tend to have higher purchasing power than cities in developing regions, despite a higher cost of living for ordinary residents as higher wages more than compensate.

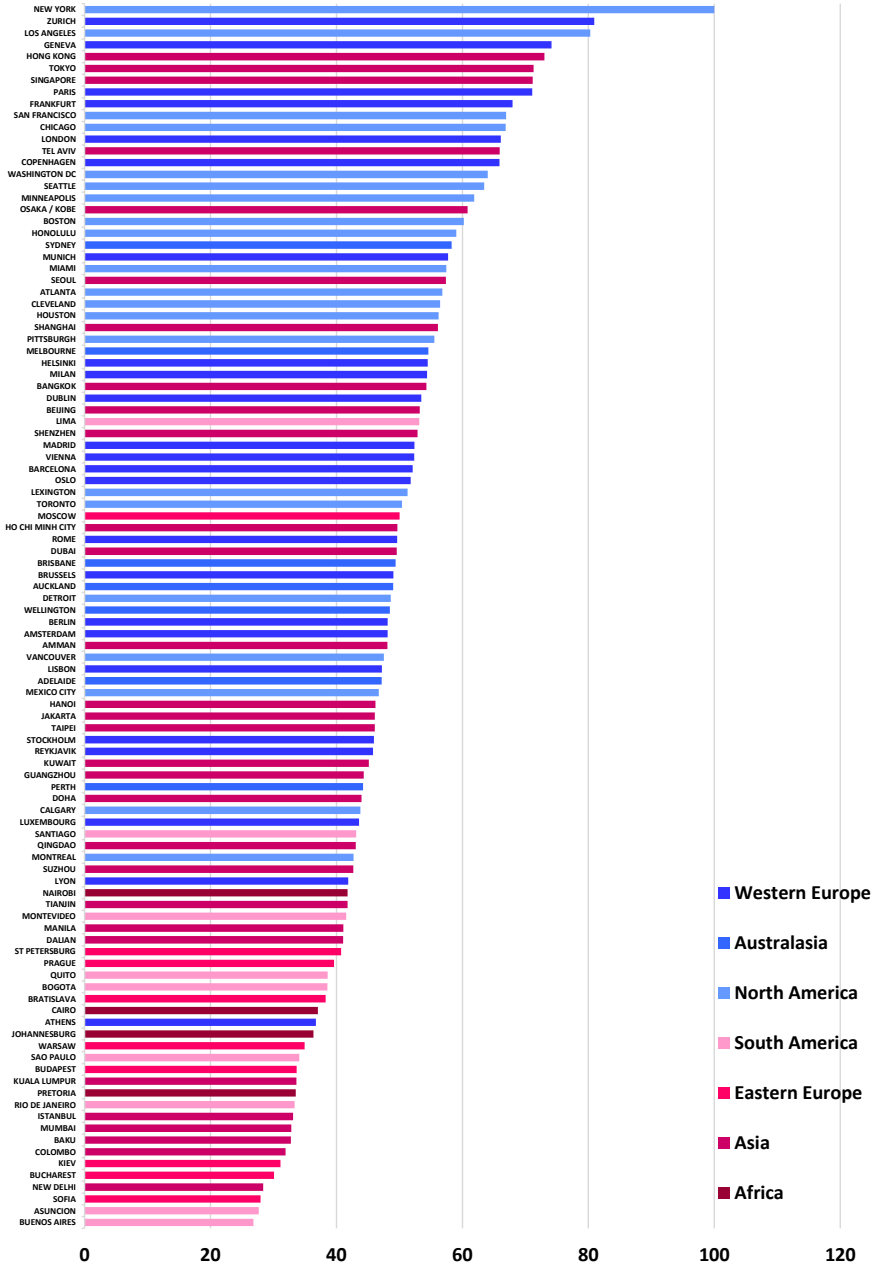
Figure 1.4 illustrates the geographical distribution of the 104 cities we have studied, according to their purchasing power for ordinary residents: the longer a city's bar, the higher its purchasing power index value and the more goods and services their ordinary residents can afford. As observed, Mexico City is the only city from the developed regions ranked in the bottom-25, while Singapore is only city from the developing regions ranked in the top-25. The relatively lower wages in Mexico City and the relatively higher wages in Singapore help to account for these exceptions.

This study highlights the importance of our study on purchasing power for ordinary citizens. Cost of living by itself is not enough to measure affordability. Ordinary residents living in a country with a high cost of living may still be able to afford more goods and services compared to ordinary residents who live in a country with a low cost of living because of their relatively higher wages. The introduction of purchasing power, therefore, facilitates a more comprehensive analysis.



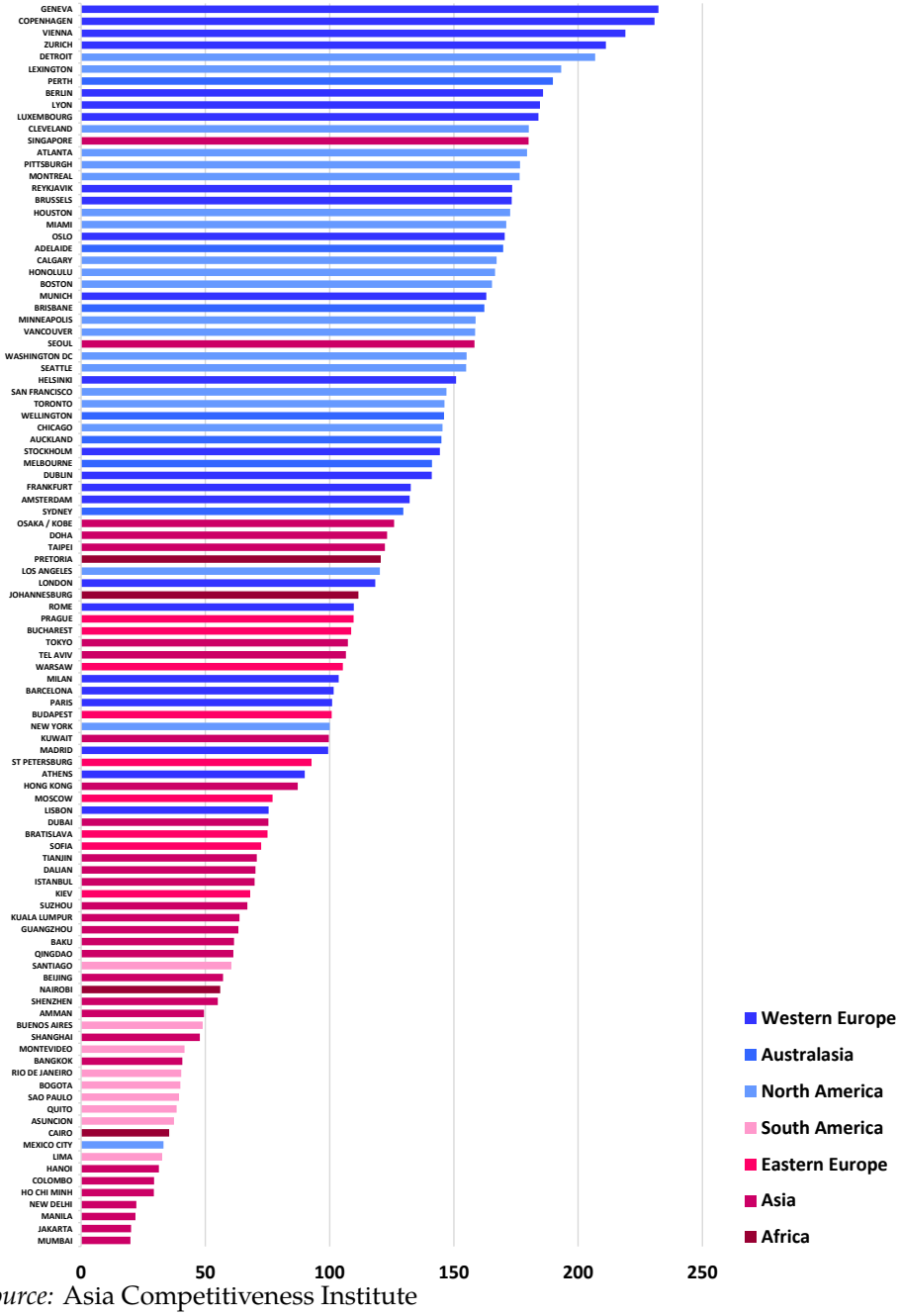
Source: Asia Competitiveness Institute

Figure 1.2: ACI's Cost of Living Index for Ordinary Residents across 104 Major Cities in the World in 2020 by Geographical Regions.



Source: Asia Competitiveness Institute

Figure 1.3: ACI's Cost of Living Index for Expatriates across 104 Major Cities in the World in 2020 by Geographical Regions.



Source: Asia Competitiveness Institute

Figure 1.4: ACI's Purchasing Power Index for Ordinary Residents across 104 Major Cities in the World in 2020 by Geographical Regions.

1.3.2 Sensitivity of Cost of Living Rankings to Exchange Rate Fluctuations

Next, we consider a more technical issue: the sensitivity of the cost of living rankings to exchange rate fluctuations. In any study that endeavours to make an international comparison of the cost of living across different cities, the price data used must always be converted to a common unit of measurement. ACI's study, as with most other studies, uses the USD as the common currency for conversion. However, the side effect of conversion is that the exchange rates of various currencies are integrated into the calculations of the cost of living indices.

As a result, the index value and, by extension, the ranking of a city, reflects not only the relative expensiveness of that city with respect to its peers but also the relative strength of its currency vis-à-vis the common currency. Exchange rate fluctuations therefore influence the cost-of-living rankings. For example, currency appreciation may help to push the ranking of a city upwards, as an overall increase in local prices over the study period will be magnified during currency conversion.

In Tan et al. (2017), we have provided a methodology and conducted a simulation for Singapore and Hong Kong to illustrate this effect. The baseline scenario of the simulation was one where the exchange rates against the USD in all cities followed their actual trajectories throughout the period 2005-2020. On the other hand, in the simulation scenario, exchange rates of all other cities still followed their actual fluctuations but the exchange rate in the city of interest, that is either Singapore or Hong Kong, was kept at its 2005 levels. The simulated cost of living rankings for expatriates and ordinary residents in these two cities were then compared with their actual rankings. Tables 1.1 and 1.2 provide an update of this simulation, incorporating the latest results based on 2020 data.

Between 2005 and 2020, the SGD appreciated by about 17.13% against the USD as the exchange rate went from 1.664 SGD per USD in 2005 to 1.379 SGD per USD in 2020. Concurrently, Singapore's position in ACI's Cost of Living Ranking for Expatriates rose from 15^{th} to 7^{th} while its position in the Cost of Living Ranking for Ordinary Residents climbed from 58^{th} in 2005 to 53^{rd} in 2010. It then moved up from 55^{th} to 54^{th} between 2011 and 2016 and from 56^{th} to 57^{th} between 2017 and 2020.[3]

However, as Table 1.1 demonstrates, if the SGD had maintained its 2005 exchange rate against the USD throughout the study period, Singapore's place in ACI's Cost of Living Ranking for Expatriates would have fallen from 15^{th} in 2005 to 18^{th} in 2020. At the same time, as shown in Table 1.2, Singapore's place in the Cost of Living Ranking for Ordinary Residents would have dropped from 58^{th} in 2005 to 64^{th} in 2010 and risen modestly from 69^{th} in 2011 to 61^{st} in 2016. Finally, it fell from 61^{st} to 65^{th} between 2017 and 2020. Furthermore, Singapore's simulated cost of living rankings, for both

[3]The ACI Cost of Living Index and Ranking for Ordinary Residents were constructed using data from three different rounds of World Bank's International Comparison Programme survey in 2005, 2011, and 2017. Thus, for a more precise analysis of the ranking, we need to split the study period into three subperiods: 2005-2010, 2011-2016 and 2017-2020. See Section 3.1.3 in Chapter 3 for a more detailed discussion.

Table 1.1: Actual and Simulated Cost of Living Rankings for Expatriates in Singapore and Hong Kong, 2005-2020.

	2005	2006	2007	2008	2009	2010	2011	2012	2013*	2014*	2015*	2016*	2017*	2018*	2019*	2020*
Singapore (Actual)	15th	13th	12th	12th	12th	10th	8th	7th	4th	4th	4th	4th	5th	6th	6th	7th
Singapore (Simulated)	-	15th	21st	31st	25th	24th	33rd	22nd	24th	16th	8th	9th	13th	20th	19th	18th
Hong Kong (Actual)	5th	6th	10th	17th	13th	12th	12th	9th	11th	10th	7th	7th	6th	4th	4th	5th
Hong Kong (Simulated)	-	7th	10th	17th	13th	12th	12th	9th	11th	10th	7th	7th	6th	4th	4th	5th
SGD/USD†	1.664	1.589	1.507	1.415	1.454	1.363	1.257	1.249	1.251	1.267	1.375	1.381	1.381	1.349	1.364	1.379
HKD/USD†	7.777	7.768	7.802	7.786	7.752	7.769	7.784	7.757	7.757	7.755	7.752	7.762	7.793	7.837	7.835	7.756

Sources: Asia Competitiveness Institute and Bank for International Settlement (BIS)
* The analysis covers 103 cities for the 2005-2012 period, 105 cities for the 2013-2016 period and 104 cities for the 2017-2020 period. Both actual and simulated rankings for Singapore and Hong Kong are not affected by the inclusion of Ho Chi Minh City and Hanoi as Singapore and Hong Kong ranked above the two Vietnamese cities. However, both actual and simulated ranking for Singapore and Hong Kong are affected by the exclusion of Caracas as they both ranked lower than the Venezuela city in 2015 and 2016.
† Average exchange rate calculated from daily exchange rate with data from BIS.

Table 1.2: Actual and Simulated Cost of Living Rankings for Ordinary Residents in Singapore and Hong Kong, 2005-2020.

	2005	2006	2007	2008	2009	2010	2011	2012	2013*	2014*	2015*	2016*	2017*	2018*	2019*	2020*
Singapore (Actual)	58th	60th	59th	56th	59th	53rd	55th	48th	48th	49th	52nd	54th	56th	57th	54th	57th
Singapore (Simulated)	-	60th	62nd	65th	62nd	64th	69th	66th	67th	64th	62nd	61st	61st	67th	64th	65th
Hong Kong (Actual)	56th	58th	60th	62nd	60th	62nd	63rd	62nd	59th	59th	51st	50th	51st	54th	50th	50th
Hong Kong (Simulated)	-	58th	60th	62nd	60th	62nd	63rd	62nd	59th	59th	51st	50th	51st	53rd	50th	51st
SGD/USD†	1.664	1.589	1.507	1.415	1.454	1.363	1.257	1.249	1.251	1.267	1.375	1.381	1.381	1.349	1.364	1.379
HKD/USD†	7.777	7.768	7.802	7.786	7.752	7.769	7.784	7.757	7.757	7.755	7.752	7.762	7.793	7.837	7.835	7.756

Sources: Asia Competitiveness Institute and Bank for International Settlement (BIS)
* The analysis covers 103 cities for the 2005-2012 period, 105 cities for the 2013-2016 period and 104 cities for the 2017-2020 period. Both actual and simulated rankings for Singapore and Hong Kong are not affected by the inclusion of Ho Chi Minh City and Hanoi as Singapore and Hong Kong ranked above the two Vietnamese cities. However, both actual and simulated ranking for Singapore and Hong Kong are affected by the exclusion of Caracas as they both ranked lower than the Venezuela city in 2015 and 2016.
† Average exchange rate calculated from daily exchange rate with data from BIS.

expatriates and ordinary residents, are always lower than its actual ranking positions, illustrating how the strong SGD has helped to push its rankings upward.

In contrast, Hong Kong's simulated rankings for both expatriates and ordinary residents are almost always identical to its actual rankings. There is no difference between the simulated and actual cost of living rankings for ordinary residents in Hong Kong between 2005 and 2020 except for 2018 and 2020 when there is a one-place difference. For expatriates, Hong Kong's simulated and original rankings are also the same for all years except for 2006 when the two differ by only one place. This is hardly surprising. The HKD is pegged against the USD, which means that there were few fluctuations in Hong Kong's exchange rate with the USD to significantly affect its actual ranking results in the first place.

This simple simulation exercise demonstrates the effect that exchange rate movements in a particular city may have on its cost of living rankings. However, exchange rate fluctuations in other cities may also influence the rankings of the city of interest. Consider, for example, the case of Singapore for the period 2011-2020. Over this period, ACI's Cost of Living Ranking for Ordinary Residents for Singapore rose by one place from 56th in 2017 to 57th in 2020, overtaking cities such as Berlin and Seoul.

The reason for this could be due to exchange rate fluctuations. Over the same period, the exchange rate of the SGD against the USD appreciated by 1.18%. In contrast, the Euro, which is the local currency of Berlin, depreciated by 0.74% against the USD;

the Won, local currency for Seoul, also depreciated by 3.17%. Thus, when local prices were converted to USD to construct the Cost of Living index for Ordinary Residents, increases in local prices in Berlin and Seoul were dampened to a greater extent than in Singapore. This disparity contributed to the rise of Singapore's ranking over these cities.

A similar observation can be made for the Cost of Living Ranking for Expatriates. Between 2005 and 2020, Singapore's place in ACI's Cost of Living Ranking for Expatriates rose from 15th to 7th. In the process, it overtook Oslo, Frankfurt, Osaka-Kobe, and Tokyo. Again, this was partly the result of exchange rate movements in these cities. From 2005 to 2020, the SGD appreciated by about 17% against the USD. In contrast, the Norwegian krone, which is the local currency for Oslo, depreciated by 45.91% against the USD and the Euro, the local currency for Frankfurt, depreciated by 9%. Meanwhile, the Japanese yen, which is the local currency for Osaka-Kobe and Tokyo, appreciated by 3.12%.

However, there are exceptions: Singapore rose above Geneva in ACI's Cost of Living Ranking for Expatriates between 2005 and 2019, even though the Swiss franc appreciated at 20.27% against the USD, a slower rate than the SGD's appreciation. These exceptions serve to remind us that while important, exchange rate fluctuations are only one among many factors contributing to changes in the cost of living rankings. The significance of exchange rate fluctuations depends on the extent to which exchange rate movements affect the actual dynamics of local prices.

1.3.3 The Effects of Currency Appreciation on Expatriates and Ordinary Residents

Technicalities about the cost of living rankings aside, exchange rate fluctuations have real effects on the welfare of expatriates and ordinary residents. To make the discussion practical, we examine a specific scenario whereby the Singapore dollar appreciates in a sustained manner against the currencies of its trading partners.

As the SGD strengthens against other currencies, it requires fewer SGD to buy one unit of the foreign currencies' worth of imports. Consequently, there is downward pressure on local, SGD-denominated prices of imports. Consumption items which are imported may, therefore, become cheaper in Singapore. This is beneficial to both expatriates and ordinary residents, especially the former, because expatriates are geared towards consuming high-end imported products. At the same time, prices of locally produced goods, which have imports as close substitutes, are also likely to decrease because of competitive pressure. Goods which use imports as intermediate inputs in their production may also decrease in price, further resulting in gains for expatriate and local consumers.

However, the transmission of exchange rate shocks to retail prices of imported goods is not a one-to-one correspondence. In other words, a 1% appreciation in the SGD may only result in less than 1% decrease in import prices. There are at least

two reasons for this. Firstly, the linkages between exchange rate fluctuations and local prices of imports as set by importers also depend on the structure of the market for imports, government's exchange rate policy, and the vagaries of the business cycles. Tan et al. (2011), for example, have shown that importers exhibited asymmetric behaviour in passing on cost-savings resulting from a stronger exchange rate over the business cycle: given an appreciation of the SGD, importers are likely to reduce local import prices by a lesser degree amidst robust economic growth than during a downturn. Secondly, imported goods also contain value added from locally-provided services, such as transport, logistics, wholesaling and retailing as they are delivered to the consumers. These services are non-traded and, as such, their costs are not sensitive to exchange rate movements. Therefore, the effect of the exchange rate on the final retail price of imports is further weakened.

On the other hand, a strong SGD makes the prices of Singapore's exports less competitive. Thus, international demand for Singapore's exports is likely to be reduced. The precise magnitude of the effect, of course, depends on the rate of appreciation that is transmitted to local retail prices of Singapore's exports overseas. More importantly, it also depends on the price elasticity of overseas demand for Singapore's exports. If demand is relatively inelastic, the decrease in quantities demanded will be marginal. However, if the reverse is true, the slump in exports will be great, and this may have severe repercussions on the employment prospects of ordinary residents working in export sectors in Singapore.

Notwithstanding the arguments above, a strong SGD does not have a direct bearing on the income and wealth of ordinary residents. Most ordinary residents are remunerated in SGD, so fluctuations in the currency do not affect the value of their income. Furthermore, since ordinary residents tend to save and invest in local assets, such as SGD-denominated time deposits or savings in CPF, the value of their wealth remains unaffected by exchange rate movements. Only the upper strata of the population may be affected as the value of any foreign assets they hold will decrease in SGD terms, as the currency appreciates.

However, a strong SGD has an income effect on expatriates, although the exact nature of the effect depends on their remuneration arrangements. If an expatriate is paid in his home currency or USD, the value of his income in terms of SGD may decrease. On the other hand, if the expatriate is compensated in SGD, the value of his income is not reduced. The appreciation of the SGD may even be beneficial for expatriates who are paid in Singapore's currency. This is because expatriates often remit a portion of their income back home, either to support dependants or to meet outstanding financial commitments such as mortgages. A strong SGD reduces the burden of remittances, as the same amount of foreign currency can be sent using fewer SGD. Therefore, more income is made available for consumption.

These conclusions are important as grounds for reinforcing, justifying or fine-tuning existing exchange rate policies in economies, like Singapore, which maintain a managed float exchange rate regime. Letting the currency appreciate may help to

mitigate imported inflation, but such a policy can be properly implemented only if there are accurate estimations of pass-through effects of exchange rate fluctuations to domestic prices. At the same time, the need to manage inflation must be balanced against other objectives as a strong currency may hamper export activities. Finally, the income effect of exchange rate fluctuations on expatriates means that exchange rate policies also affect a city's ability to attract global talent.

1.3.4 Relationships between Cost of Living, Purchasing Power, Liveability and Economic Competitiveness

Reliable indices also allow us to examine the relationships between the cost of living, purchasing power, liveability and economic competitiveness, which are interrelated dimensions that contribute to urban dwellers' quality of life. Following the influential contributions of Florida (2005), a strand of urbanisation literature has emerged which recognises the role of cities as hubs for creativity and innovation, which drive economic growth for the entire country. ACI has similarly explored the relationship between affordability and economic competitiveness in Tan et al. (2011).

In this context, the literature emphasises the need for cities to attract and retain human capital of high calibre, especially those who Florida (2005) referred to as the "creative class", by providing them with a good quality of life. While there is no consensus on what defines "quality of life", several studies have attempted to identify its different characteristics.[4] Beyond conventional academic research, the idea of quality of life has also caught on among private and consulting organisations, which often produce quality of life rankings for global cities. At the same time, improving ordinary residents' quality of life has become the "rallying cry of many big-city mayors" around the globe (see Hasan (2008)).

In Tan et al. (2017), we have examined the nexus between the cost of living, purchasing power and liveability, whereby the latter is measured by the Global Liveable City Index (GLCI) as presented in Tan et al. (2017). We found that liveability does not explain the cost of living, despite a generally positive association. A city may be highly liveable, but its cost of living for ordinary residents can remain relatively low. Berlin, Singapore, Taipei and Hong Kong are examples of such cities.

1.4 Contributions and Chapter Organisation

This book provides a valuable compendium of annual indices and rankings of cost of living for expatriates and cost of living, wages and purchasing power for ordinary residents in 104 major cities in the world from 2005 to 2020. Now in its eighth edition, ACI's study reflects salient differences in costs of living for expatriates and ordinary urban dwellers which arise from variations in their lifestyles and consumption pref-

[4] See Rogerson (1999) and Hasan (2008) for an overview of this literature.

erences. This is of critical significance as the cost of living for the former is usually conflated with that of the general public. We believe that ACI's pioneering attempt is the first comprehensive study of ordinary residents available today. As for expatriates, cost of living research is widely available, but as reviewed in Section 1.2, these are conducted in a much less rigorous manner than the ACI study.

The publication of this book represents a monumental undertaking combining leading-edge research with rigorous methodology and datasets, which are disclosed openly. Weights employed for consumption baskets are justified across different continents and stated explicitly. Moreover, all assumptions are laid out transparently. It is our belief that unless assumptions, methodology and data sources are disclosed publicly for open scrutiny, non-rigorous studies will mushroom and spreading spurious and misleading results.

This book is of interest to various parties. The findings in this book allow MNC employers to review and adjust compensation packages for expatriates, based on differences between expatriates' and ordinary residents' costs of living, to make them more competitive. For academics, the ACI research provides more accurate depictions of the cost of living at the city level. The distinction made between ordinary residents and expatriates opens up more tools for social research. Finally, for policymakers, who aim to make city life better for ordinary residents, our indices provide a reliable way to track ordinary residents' cost of living, and, more importantly, to find out whether ordinary residents' purchasing power has increased over time. Poverty statistics can also be measured differently by taking into account the cost of living of ordinary residents. Finally, the analysis presented through our case studies can yield important policy implications.

The 104 major cities in the world covered by the ACI's study are located all over the globe, including cities in Africa, Asia, Australasia, Western and Eastern Europe, North and South America. The list of cities is shown in Table 1.3 below.

Table 1.3: List of Cities Covered in the 2022 ACI Annual Indices on Cost of Living, Wages and Purchasing Power.

No.	City	Country	Region
1	Adelaide	Australia	Australasia
2	Amman	Jordan	Asia
3	Amsterdam	Netherlands	Western Europe
4	Asuncion	Paraguay	South America
5	Athens	Greece	Western Europe
6	Atlanta	United States	North America
7	Auckland	New Zealand	Australasia
8	Baku	Azerbaijan	Asia
9	Bangkok	Thailand	Asia
10	Barcelona	Spain	Western Europe
11	Beijing	China	Asia
12	Berlin	Germany	Western Europe
13	Bogota	Colombia	South America
14	Boston	United States	North America
15	Bratislava	Slovakia	Eastern Europe
16	Brisbane	Australia	Australasia
17	Brussels	Belgium	Western Europe
18	Bucharest	Romania	Eastern Europe
19	Budapest	Hungary	Eastern Europe
20	Buenos Aires	Argentina	South America
21	Cairo	Egypt	Africa
22	Calgary	Canada	North America
23	Chicago	United States	North America
24	Cleveland	United States	North America
25	Colombo	Sri Lanka	Asia
26	Copenhagen	Denmark	Western Europe
27	Dalian	China	Asia
28	Detroit	United States	North America
29	Doha	Qatar	Asia
30	Dubai	United Arab Emirates	Asia
31	Dublin	Ireland	Western Europe
32	Frankfurt	Germany	Western Europe
33	Geneva	Switzerland	Western Europe
34	Guangzhou	China	Asia
35	Hanoi	Vietnam	Asia
36	Helsinki	Finland	Western Europe
37	Ho Chi Minh City	Vietnam	Asia
38	Hong Kong	Hong Kong, China	Asia
39	Honolulu	United States	North America
40	Houston	United States	North America

Table 1.3 continued from previous page.

No.	City	Country	Region
41	Istanbul	Turkey	Asia
42	Jakarta	Indonesia	Asia
43	Johannesburg	South Africa	Africa
44	Kiev	Ukraine	Eastern Europe
45	Kuala Lumpur	Malaysia	Asia
46	Kuwait City	Kuwait	Asia
47	Lexington	United States	North America
48	Lima	Peru	South America
49	Lisbon	Portugal	Western Europe
50	London	Great Britain	Western Europe
51	Los Angeles	United States	North America
52	Luxembourg	Luxembourg	Western Europe
53	Lyon	France	Western Europe
54	Madrid	Spain	Western Europe
55	Manila	Philippines	Asia
56	Melbourne	Australia	Australasia
57	Mexico City	Mexico	North America
58	Miami	United States	North America
59	Milan	Italy	Western Europe
60	Minneapolis	United States	North America
61	Montevideo	Uruguay	South America
62	Montreal	Canada	North America
63	Moscow	Russia	Eastern Europe
64	Mumbai	India	Asia
65	Munich	Germany	Western Europe
66	Nairobi	Kenya	Africa
67	New Delhi	India	Asia
68	New York	United States	North America
69	Osaka-Kobe	Japan	Asia
70	Oslo	Norway	Western Europe
71	Paris	France	Western Europe
72	Perth	Australia	Australasia
73	Pittsburgh	United States	North America
74	Prague	Czech Republic	Eastern Europe
75	Pretoria	South Africa	Africa
76	Qingdao	China	Asia
77	Quito	Ecuador	South America
78	Reykjavik	Iceland	Western Europe
79	Rio de Janeiro	Brazil	South America
80	Rome	Italy	Western Europe
81	San Francisco	United States	North America
82	Santiago	Chile	South America

Table 1.3 continued from previous page.

No.	City	Country	Region
83	Sao Paulo	Brazil	South America
84	Seattle	United States	North America
85	Seoul	South Korea	Asia
86	Shanghai	China	Asia
87	Shenzhen	China	Asia
88	Singapore	Singapore	Asia
89	Sofia	Bulgaria	Eastern Europe
90	St Petersburg	Russia	Eastern Europe
91	Stockholm	Sweden	Western Europe
92	Suzhou	China	Asia
93	Sydney	Australia	Australasia
94	Taipei	Taiwan, China	Asia
95	Tel Aviv	Israel	Asia
96	Tianjin	China	Asia
97	Tokyo	Japan	Asia
98	Toronto	Canada	North America
99	Vancouver	Canada	North America
100	Vienna	Austria	Western Europe
101	Warsaw	Poland	Eastern Europe
102	Washington DC	United States	North America
103	Wellington	New Zealand	Australasia
104	Zurich	Switzerland	Western Europe

Source: Asia Competitiveness Institute

The rest of the book is organised as follows. Chapter 2 discusses at length the methodology on the cost of living of expatriates, presenting data sources including prices and weights used where assumptions made are also explicitly stated. The method to construct the overall Cost of Living Index and Ranking for Expatriates, as well as for each ACI Consumption Category is spelt out in detail. The chapter will also present the results and findings pertaining to the Cost of Living Ranking for Expatriates in the 104 cities. It first highlights the latest ranking positions for the top- and bottom-25 cities, based on data for 2020. Next, it describes some notable observations regarding the rankings for expatriates for each region covered in the study before zooming in to the major global financial centres, which include New York, London, Hong Kong, Singapore, Shanghai and Tokyo. Finally, the chapter presents the results of the Cost of Living Index and Ranking for Expatriates in each of the 104 cities between 2005 and 2020.

Chapter 3 describes the methodology for cost of living, wages and purchasing power for ordinary residents where components of adjustment factors, such as inflation rates, nominal expenditure and real expenditure per capita, are highlighted. The construction of the overall Cost of Living Index and Ranking for Ordinary Residents,

together with category-specific cost indices and rankings, is elaborated upon in this chapter. The computation of the Wage Index and Ranking for Ordinary Residents, involving gross average nominal monthly wages and mean weekly hours actually worked, is also illustrated step by step. The chapter then describes the methodology used to construct the Purchasing Power Index and Ranking for Ordinary Residents from the cost of living and wage indices. Following this, the chapter provides the corresponding analysis for the cost of living, wages and purchasing power indices and rankings for ordinary residents. The latest results based on 2020 data for the top- and bottom-25 cities are reported first. Region-specific observations about the rankings are followed by a discussion on the trends for the cost of living, wages and purchasing power for ordinary residents in each of the 104 cities between 2005 and 2020. When conducting the trend analysis, we split the study period into three sub-periods: from 2005 to 2010, from 2011 to 2018 and from 2018 to 2020. This is because the Cost of Living Index for Ordinary Residents, which is also used in the computation of the Purchasing Power Index for Ordinary Residents, is constructed using data from three different rounds of the World Bank's International Comparison Program (ICP) survey in 2005, 2011 and 2017.