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Introduction: Motivations of the Study

1.1 The first comparative study of housing dynamics across East Asian countries

The Global Financial Crisis (GFC) of 2007–2009 and its aftermath have demonstrated the large impact that housing volatility can have on the stability of the national economy in highly urbanized, high-income countries, where housing has become the most important class of real assets and is often larger than financial assets. This study explores the two-way interactions between housing and the macroeconomy in six East Asian economies: China, Hong Kong, Japan, South Korea, Singapore and Taiwan. The analysis focuses on the risks that real estate price and output volatility might create for the stability and performance of the national economy.

The study focuses on three main questions. First, how have the growth models followed by East Asian economies shaped the organization and dynamics of the housing sectors that we observe today? Second, has housing volatility in East Asian economies differed from Western experiences in recent decades? And, do sources of risks for the wider economy as well as transmissions channels differ in East Asia?

We draw upon leading current frameworks in development economics, real estate finance, real estate cycles and urban economics to understand the common features that these six economies share. We also identify the factors that make the performance of their housing systems different at times, including during the 1997 Asian Financial Crisis (AFC) and during the Global Financial Crisis (GFC) a decade later. To complement usual econometric analyses of housing cycle analyses, we shall also consider

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how the structure of the incentives embedded in the institutions of these countries has been shaping the behavior of the six key players who actually drive housing and real estate cycles everywhere, usually in different ways in each case.

What distinguishes this study from previous studies of East Asian real estate is its genuinely comparative nature. Previous international books on national housing systems have presented country-specific information in collections of individual chapters, whose contents and quality are determined by the ability of the book's editors to recruit leading national experts to write them. These books do not provide readers with a common analytical framework that can deepen their understanding and increase their own analytical independence of judgment about the performance of the countries covered. Usually, the contributors are leading specialists in their own countries, yet the best use we can make of such work is to consult each country's chapter for its factual content, and for the individual authors' insights into the dynamics of their national housing markets, usually during the latest decade. Implicit analytical frameworks differ, and so does the internal organization of each case study. One ambition of the present study is to offer its readers the opportunity to develop their own views on the similarities and contrasts between the drivers of these six housing systems.

1.1.1 Why East Asia?

Since the GFC and the Great Recession of 2008–2009, international research and policy discussions have focused intensely on the Western countries that have been highly impacted by the GFC. However, East Asian housing systems are also worth studying on their own merits, because these economies have been among the most dynamic ones in the world for decades, and also they produce a major share of global housing output.

By now, East Asian housing systems represent about one third of the world's housing output. The East Asian share of global GDP (measured in PPP terms in the IMF's *World Outlook*) rose from 12.8% of world GDP in 1980, to 23.8% in 2010, and it was approaching 25% in 2015, as seen in Figure 1.1. In the absence of global estimates of the total value of housing, we can infer from national GDP data that the six East Asian housing systems make up at least 30% of global housing output – probably more. The reason why the East Asian share of global housing is considerably larger than their share of global GDP is because, in highly urbanized countries, the *values* of annual housing output and of total existing housing assets are much higher than in low-income and middle-income economies, where household incomes are lower by multiples and the housing sector remains a much smaller part of the economy.

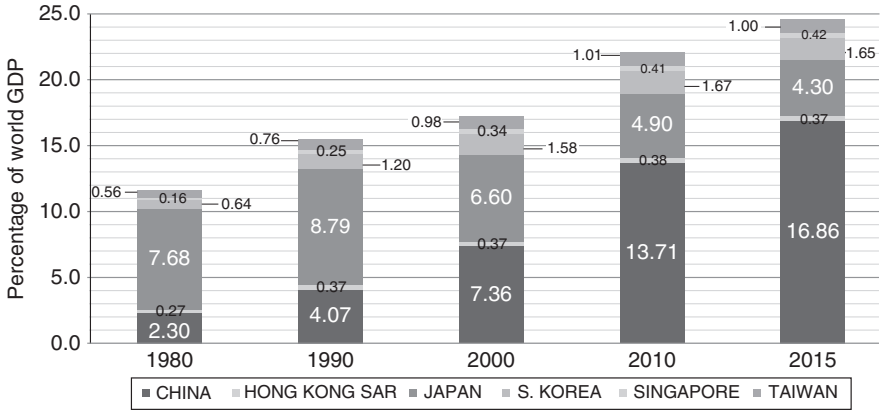

Figure 1.1 East Asian shares of world GDP, 1980–2015.

1.1.2 Why focus on housing and not on every type of real estate in the economy?

Real estate is the quintessential non-traded sector of an economy. Providing services to local business and consumers, the sector's performance in terms of prices, levels of output and volatility is woven into the structure and performance of the overall economy. The real estate industry is composed of different residential and non-residential sectors, each with its own distinct cyclical behavior. We focus on housing because, together with financial assets, housing is one of the two largest asset classes in every high-income economy. Moreover, between these two major classes of assets, housing volatility has had by far the largest and longest lasting impact on macroeconomic stability in high-income economies, due to the leveraged nature of housing investment.

The focus on housing is also motivated by the GFC. During the three decades of the Great Moderation from the early 1980s to 2007, the variability of total output in the US economy fell by more than 50%, and inflation declined by two-thirds (Bernanke, 2004). During that period, many macroeconomists found it convenient to lump together all forms of asset price changes in highly aggregated conceptual models, whether these assets were financial assets, like stock market securities, or tangible assets, such as residential or non-residential real estate assets. The GFC and the Great Recession of 2008–2009 have drastically altered perceptions of the capacity of property markets to influence developments in the macroeconomy, in the banking system, and in labor markets.

The main types of non-residential real estate assets are: offices, retail, warehousing and industrial. Except for warehousing and industrial real

estate, these are closely linked to local urban employment. Commercial real estate is the second largest RE asset class after housing, but it is considerably smaller. A rare estimation of the composition of US urban real estate assets in 1989 was that housing represented 79% of all real estate assets, offices 8.5%, retail 7%, and warehousing and industrial 5.5% (Hartzell *et al.*, 1994). In spite of the much greater role that land plays in the value of real estate assets in East Asia than in the US, there is no obvious reason why the composition of urban real estate assets in East Asia would differ greatly from the basic US mix of 80% residential and 15% non-residential offices and retail real estate assets, with 5% going to the rest of real estate.

The various types of real estate assets have different cyclical properties. The volatility of each type depends crucially on the interactions between the rationality of investors' expectations and the structural characteristics of each real estate type, which are asset durability, investment lags behind shifts in demand and supply, and demand elasticity. Typically, in the US, office cycles and multi-family housing cycles are more volatile, and have shorter peak-to-trough duration than the dominant detached housing sector. Is that also true in East Asia, given that multi-family housing units prevail in high-density EA cities? Should we expect the cyclical characteristics of housing and commercial RE to be behaving more similarly in East Asia than in Western countries? If the supply of housing in East Asia is inelastic for institutional and physical reasons, existing analytical models of real estate cycles lead us to expect more price volatility than in Western economies as a consequence (Wheaton, 1999).

1.2 Distinguishing features of East Asian economies

There is a genuine unity of analysis in focusing on East Asia. The six economies share three important characteristics that justify calling them East Asian (EA) economies, to differentiate them from Western economies or from South-East Asian and South Asian groupings. First, they have very high rural and national population densities, which are multiples of most Western economies.

Second, in spite of significant differences in local cultures, these societies share a deep Sinitic heritage, especially from Confucianism, that has had a lasting impact on the governance of their public and private institutions as well as on prevailing norms of public and private behavior. Vietnam is the only other East Asian society left out of the study, for lack of suitable information.

Third, during the second half of the 20th century, the governments of these societies have successfully pursued development strategies and implemented industrial policies that have resulted in the highest sustained economic growth rates in the world over several decades, together with the

fastest rates of urbanization on record. In spite of its detached geographic location at the crossroad of South-East Asia, Singapore belongs to the group of East Asian economies, because of its dominant cultural heritage, institutions and economic performance.[1]

1.2.1 Impact of high East Asian population densities on economic growth and urbanization

The high population densities of East Asian economies have played a major role in their urbanization. Urbanization is central to economic development, in which it has three basic functions. First, the concentration of population allows an economy to carry out a greater variety of manufacturing and service activities, with more efficient economies of scale.

Second, transportation systems are more efficient within cities and metropolitan regions, compared to the high costs of transportation over longer distances in rural areas. In fact, the economic and spatial size of a city is usefully defined by the size of its internal labor market and the maximum feasible travel distance for the daily journey to work in that city.

Third, many cities play a strategic role in meeting the physical services and institutional requirements of international trade, and the important share of export-oriented industrialization has accentuated the concentration of population in major metropolitan areas during East Asian economic growth take-offs. The modern economic geography of trade developed by Krugman, Fujita, Venables and others has significantly deepened and refined our understanding of these three drivers of urban change (Duranton, 2009).

The evolution of the national population densities in China, Japan, Korea and Taiwan is graphically presented in Figure 1.1. These gross national densities under-represent their urban reality by very large margins. Both Japan and Korea are mountainous countries, where only about a fifth of the land is flat enough for agriculture or for cities with slopes of less than 15°. Similarly, the gross national density misrepresents the distribution of population in China. The "380-millimeter isohyet line" (or 15-inch isohyet) of annual rainfalls permitting agriculture is of major significance for understanding the geography and history of China. Only 43% of China's territory lies east and south of this isohyet line, but 90% of China's population was concentrated there in 2000. Excluding the city economies of Hong Kong and Singapore, Taiwan has the highest gross densities of the four EA economies, but it is somewhat less mountainous than Japan or Korea, and 45% of its land can be cultivated or used for cities. Figure 1.2 also shows how these

[1] The case of Singapore illustrates the general finding that civilizations and cultures, through the institutions that they foster, have a greater impact than geography in explaining a country's rate of economic development. See Rodrik *et al.*, 2002.

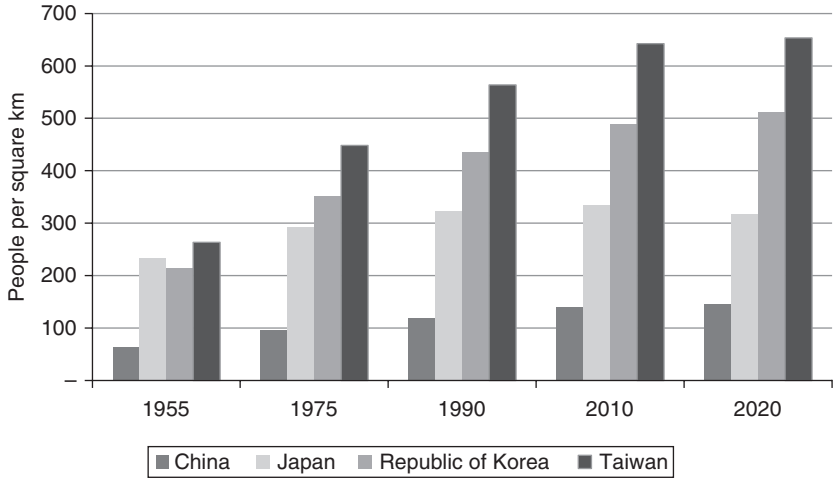

Figure 1.2 East Asia: high and rising gross population densities, 1950–2020.

high national population densities have risen further in every EA economy until 2010, but these densities are projected to stabilize by year 2020.

The most conspicuous trait of East Asian economies is very high *rural* population densities. EA rural densities have been multiples of the rural densities found in Western economies and other regions of the world. National statistics differ significantly across countries in their criteria of what constitutes a town or a city, but everywhere they define urban areas explicitly or implicitly by their density. In East Asia, concentrations of rural population reach high densities that would be called urban elsewhere. On the other hand, urban population densities in the (administratively defined) cities of East Asia are closer in magnitude to the urban densities found in Western cities. Yet East Asian urban densities remain higher which, among its variety of impacts, contributes to the higher relative cost of floor space, everything else being equal. The successful EA growth strategies that followed from the 1950s have built on these high rural densities and the economies of scale that they permit, even in the early stages of development of labor intensive industrialization.

In contrast with the consistently high EA densities, population densities vary greatly across Western countries. Figure 1.3 shows the level and increase over time of gross densities in six Western countries in 70 years. Among Western countries, only the Netherlands has gross densities comparable to those of Korea or Taiwan, but a favorable qualifier is that there are no mountains in the Netherlands, and that it is a very flat country. Somewhat similarly to East Asia, high and rising Dutch densities, and the need to maintain the system of polders in rural areas, have led to strong communal practices towards land in both rural and urban areas and public value recapture in urban

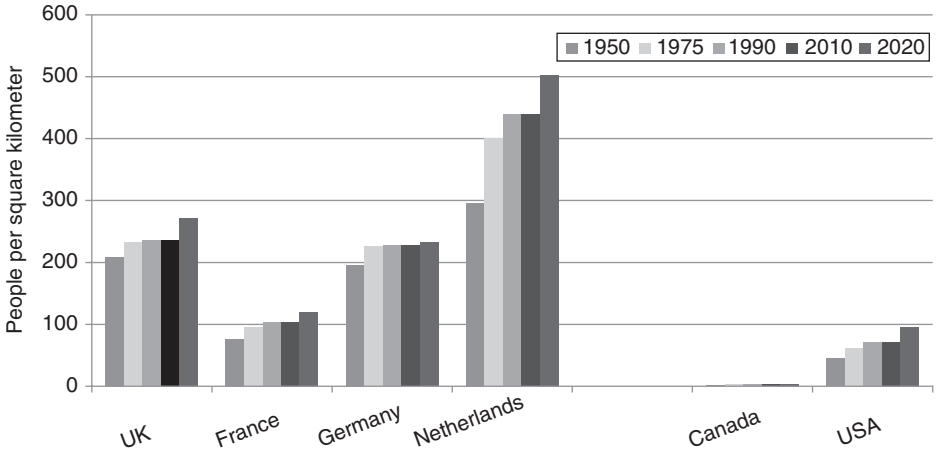

Figure 1.3 Gross population densities in six Western countries, 1950–2020.

development (Needham, 2007). At the other end of the Western spectrum, Canadian gross densities are so low that they do not even show in Figure 1.3. In 2010, the size of the total population of Canada, with 33.4 million people living on 9.09 million km^2, was of the same magnitude as that of the special municipality of Chongqing in Sichuan, China, with its 28.8 million people living on 82 000 km^2, which is 110 times less land.

Increases in urban densities have important impacts on housing, yet the economic consequences of high densities remains to be analyzed across countries, or even over time within one country. One pressing question is whether real housing prices follow a non-linear trajectory that becomes *steeper* as high population densities continue to rise. This issue faces every East Asian country, and several Western countries with high densities, such as the UK, the Netherlands and Germany. For the UK, Miles (2012) argues that the 'impact of further rises in *per capita* income and in population is non-linear and will be increasingly on price[2].'' As levels of population densities, sizes of cities and household incomes keep rising, so also do concerns for the environmental sustainability of cities and the demand for green development. We cannot ignore that, between 1950 and 2010, the total population of the six EA countries increased 2.33 times from 665 million in 1950, to 1,553 million in 2010 (UN Population Division, 2012).

[2] Suggestive of the rising non-linearity of land prices in East Asia, Hyundai Corporation paid 10.55 trillion Won (US $10bn) for a 79 000 m^2 plot in the Gangnam district of Seoul. ''Investor dismay over land purchase for HQ'' *Financial Times*, p. 15, Friday 19, September 2014.

1.2.2 Significance of the Confucian cultural legacy for East Asian institutions and policies

From the 1950s to the 1980s, East Asian cultural and political legacies have shaped the emergence of national real estate systems through the balance between public and private property rights in land use, policies followed toward the development of the financial system and housing finance, and other economic and urban choices. The social and political thoughts and beliefs behind these choices become clearer by considering the impacts of the Sinitic cultural legacy on these societies, compared with Western and other societies.

East Asia, as a civilization, "*comprises countries which in the past have embraced the classical Chinese language and script as a principal medium for their high culture, and which in some significant degree have embraced both Mahayana Buddhism and neo-Confucianism. Four countries meet all these conditions*: *China*, *Korea*, *Japan and Vietnam*. *This, no more and no less is East Asia. […] This high culture provided the cultural norms of the educational systems […]. It is the network that provides common ground for the diverse ethnic groups of China, Japan, Korea, and Vietnam, and unites these extremely diverse individual cultures*" (Ramsey, 2013).

The ideals of the Confucian tradition have had deep and lasting impacts on both the public and the private spheres. Their influence remains present today, even after decades of very rapid economic development, so compressed in time.

Contrasting political and social traditions in East and West, a leading Western scholar points to, "*a specific and distinctive commitment to public service and humanistic scholarship in ways not typically associated with traditions deriving from Semitic religions. […] For Confucians the applicable criterion was the greater good of the commonalty. […] and since the model for the commonalty was the family, the essential criterion has been whether economic activity, including capitalist activity, served the long-term interests and values of the family or, by extension, the state as a whole*" (de Bary, 1988, p. 118).

Included in these values, views of the law in traditional East Asia have differed from those in the West.

Confucian legacies that have played an immediate role in the very rapid economic growth of East Asia are a very strong emphasis on education, lifelong learning and personal diligence, which has resulted in a level of human capital that was considerably higher than would be predicted based on the level of *per capita* GDP alone. Respect of family, social hierarchies, and an emphasis on proper social interactions and group loyalty, have also meant a strong emphasis on the common good. Civil service systems have recruited

the best students on merit through competition, which means that the civil service has enjoyed a high degree of prestige, and also that social mobility has been high, especially during the economic take-off. The Confucian concept of the "benevolent ruler" has also been used in support of authoritarian governments during the economic take-off. Long traditions of detailed record-keeping has meant that the quality of economic and social information has also been high, considering the *per capita* GDP level. Given these conditions favorable to development, the critical factor has become the choice of economic strategies and the quality of their implementation over time.

1.2.3 The "Developmental State" and its role in East Asian economic growth take-offs

A major impact of the Sinitic tradition in the economic sphere has been the emergence of the "developmental state", which gained strength first in Japan in the pre-World War II period, and then spread across the emerging East Asian economies during the post-war decades. One concise description is that, "*the secret of development in our world seems to lie in the combination of the rationality of the market in allocating scarce resources, and the strategic guidance of the state in charting the development course in a comprehensive way, while keeping the state's relative autonomy over the interests of specific groups*" (Castells *et al.*, 1990). The concept of the "developmental state" was first articulated by Johnson (1982) in his influential study of the political economy of Japan's industrialization between 1925 and 1975. Chalmers Johnson has summed up the main features of the developmental state across East Asia as follows:

"*My contention is that the Japanese, Koreans and Taiwanese have put together the political economy of capitalism in ways unprecedented in the West…[These are]: (1) financial control over the economy; (2) labor relations; (3) the degree of autonomy of the economic bureaucracy; (4) the degree to which the state has been captured by its main economic clients; (5) balance between incentive and command in economic guidance; (6) special private sector organizations… and (7) the role of foreign capital*" (Johnson, 1982).

Expanding upon Johnson's analyses, Wade (2004) found that the East Asian success in "governing the market" had three main outcomes: very high levels of productive investment, relatively more investment in certain key industries, and exposure of many industries to international competition. These outcomes resulted from economic policies, incentives, controls and risk-spreading mechanisms that came from a strong and proactive government.

Public interventions, which we shall revisit later from an urban and housing sector perspective, included:

- redistribution of agricultural land in the early post-WWII period;
- controlling the financial system and making financial capital subordinate to industrial capital;
- maintaining stability in the key economic parameters that affect long term investment – exchange rate, interest rate and the general price level;
- managing the impact of foreign competition and prioritizing the use of scarce foreign exchange;
- promoting exports;
- promoting technology acquisition;
- providing assistance to specific industries.

The developmental state achieved different production and investment outcomes from that which would have resulted under free market policies. Critically, such public actions would not have been possible without a specific organization of the state *and* of the private sector during the economic take-off. East Asian success combined a strong public administration and a strong private sector, in contrast with other developing countries that either have had a weak state or a weak private sector, or both (Lindblom, 1977; Riggs, 1964).

1.3 Organization of the book

To better understand the interactions between housing and the wider economy in East Asia, the study goes deeper than econometric studies comparing housing cycles, financial cycles and business cycles, which take the underlying institutions shaping these cycles as given and focus on measurable and testable quantitative outcomes (Igan *et al.*, 2011). We proceed in three complementary ways.

First, we look back at the emergence of modern mass housing markets across East Asia during the growth take-off period, to learn how these decades have laid the foundations of current EA housing markets, because understanding the origins of these housing systems throws considerable light on how they work today.

Then, within the constraints imposed by data limitations across countries, we use established econometric techniques for the study of cycles to investigate the secular and cyclical components of East Asian housing prices, as well as their volatility in comparison with Western housing systems.

Finally, to investigate the specific source and channels of interactions between housing and the macroeconomy, a third level of analysis investigates the distinct behavioral incentives of the six key players that shape housing cycles in different ways in different economies. These six players are the central bank, the central government, local governments, households, banks, and developers. The interactions over time between these six players determine the risks of a boom-bust cycle. These interactions are best understood at the country level and we focus on China given the widespread interest in the implications for the wider economy of a housing downturn in this new market system. We also focus on S. Korea as a comparator to China in terms of extremely rapid development, except for scale.

1.3.1 Part I: Foundations and emergence of modern East Asian housing systems

Part I shows how the foundations of present EA housing systems were laid during the decades of fastest industrialization and urbanization of these countries, known as the "economic growth take-off stage", and then proceeds to analyses of the individual dynamics of present housing systems in Japan, Taiwan, Hong and Singapore. Part I shows the validity of the observation that "knowing how something originated often is the best clue to how it works" (Deacon, 1997).

The comparison of the emergence of organized mass housing systems in other East Asia several decades ago, during their growth take-offs, throws considerable light on the recent emergence of a new housing system during China's own growth take-off stage, which has just come to an end. Clearly, this "growth take-off stage" holds a central place in Part I – but what is it? Development economics finds it significant to distinguish two main stages in the long-term economic growth and development of a country (Rodrik, 2005). First, there is a rather rapid growth take-off stage, until the economy reaches a *per capita* GDP of around $10 000 PPP dollars (Brülhart and Sbergami, 2009; Eichengreen *et al.*, 2013).

The second stage of development is marked by a shift in growth regimes to a slower, sustained long-term growth, during which a country reaches a high income level and becomes fully urbanized. Between these two stages lies a critical "growth transition", often called by development economists the "middle-income trap", because it is economically and politically a risky transition that many countries have failed to manage successfully. China is currently going through this uncertain and risky growth transition. The other five EA economies did not fall into their own middle-income traps, and they are now advanced economies. The ratio of their urban population is between 80% and 100%, which also means that their housing assets now constitute the largest class of assets in the economy, above financial assets.

The impact of economic growth regimes on the organization of housing systems in East Asia has been very significant throughout the development of these housing systems. Chapter 2 presents the urban and housing dimensions of the development policies that drove urban growth take-offs that were exceptionally rapid and powerful across East Asia. Chapter 3 then discusses the transition of traditional East Asian vernacular housing system into modern mass housing urban systems, driven by the spatial transition from a historical "Von Thünen urban dynamics" to the modern "Krugman urban dynamics" of industrialization and the growth take-off. Far from leading to identical housing systems, the differences in the growth strategies adopted by individual East Asian governments at the start of the growth take-off resulted in four very distinct types of housing strategies, whose effects are still being felt today. One benefit of looking back at the emergence of modern housing systems across East Asia in Part II is to show that, far from being unique to China today, the peak rates of urban concentration that characterize the earlier EA growth take-offs also led to skyrocketing land and housing prices which, in turn, induced strong and lasting public policy responses, especially in Japan and South Korea.

When discussing the transition from pre-industrial vernacular housing to the organized urban mass housing markets of today, Part I highlights characteristics of EA housing systems that differentiate them from western housing systems in four areas:

- the regulation of land use and urban planning;
- financial sector policies and housing finance;
- housing taxation and subsidies; and
- the direct provision of public housing.

1.3.2 Part II: Current East Asian housing systems

Five of the six East Asian economies are today high-income, advanced societies with large, deep and internally differentiated housing systems. Only China remains a middle-income, only partially urban economy that expects a considerable increase in its urban population over two decades. Chapter 4 first provides a regional overview of the six housing systems. It then compares and contrasts the impact of the 1997 Asia Financial Crisis, and then that of the Global Financial Crisis a decade later. The severity of the impacts of these crises, two decades apart, was clearly different for the six EA housing systems taken as a group. These impacts differed significantly between countries, as well as during each crisis. Three country groupings emerge for both crises. Korea, Hong Kong and Singapore were the most impacted each time, in terms of housing prices and GDP, but the AFC resulted in bigger

downturns in housing prices than during the GFC. China and Taiwan were essentially unaffected. The behavior of Japan's housing and other real estate stands apart, because the two crises occurred when Japanese housing markets were still in decline in the prolonged aftermath of the burst of Japan's multiple asset price bubbles in 1990. Remarkably, Taiwan is the only EA country to come out virtually unaffected by either crisis.

To understand better how each country reacted differently to the two crises, Chapter 5 analyses the institutional structure and contrasts the behavior and dynamics of the Japanese and the Taiwanese housing systems, where the capital region in Taiwan and the six largest cities in Japan behave differently and are more volatile than the rest of the national system in these two countries. Chapter 6 then compares and contrasts the city-states of Hong Kong and Singapore.

The case studies of China and Korea are postponed until Part IV, to avoid covering these two housing systems in detail twice. The rationale for this decision is to complement the quantitative analyses of the drivers of East Asian housing cycles that is carried out in Part III, based on mainstream econometric analysis of cycles, with a less common approach to investigating drivers of cycles in the remaining two cases of China and Korea from an institutional perspective. This less common approach focuses on the incentives and behavior of the six key players already mentioned that are actively shaping any housing cycle.

We expect this complementary approach to be especially useful for our understanding of China's new housing system, where housing prices data are limited in time and space, because the Chinese housing system has changed fundamentally with the housing privatizations of 1998. This far-reaching historical reform has transformed the dynamics, not only of housing, but of the entire Chinese economy. It also led to the great housing boom of 1998–2012. Given its very rapid transformation and the structure of its housing system, Korea is a useful conceptual comparator for China. Another reason is our better access to, and familiarity with, the needed information about the behavior of these six players in Korea over a much longer period of five decades.

1.3.3 Part III: Drivers of East Asian housing cycles: evidence and analysis

Using established econometric techniques for the study of cycles, Part III investigates quantitatively the trend and cyclical component of East Asian housing prices, as well as their volatility in comparison with selected Western housing systems, at the national level, in capital cities and selected other large cities (which, taken together, will also be described as "primate" cities).

Due to data constraints that are only too frequent, the analysis focuses on price movements and does not cover housing output volatility. Even then,

housing prices are not measured in a consistent manner across countries. Moreover, the periods of time for which consistent housing price index series (HPI) exist vary from country to country. These time series can even differ in length from city to city. Part III is, therefore, divided into two complementary parts.

Chapter 7 describes the quantitative evidence available on the six EA housing systems, and makes basic comparisons with the cyclical behavior and volatility of selected major Western housing systems. First, it provides an overview of the magnitudes of the housing price cycles that were observed across East Asia over four decades, and presents basic comparative statistics of the difference in the volatility of housing prices across East Asian capital cities during the decades of the 1990s and 2000s. The chapter discusses the limitations of recent statistical methods of defining an asset price cycle, its peak, trough and duration. It uses a heuristic approach to identify 11 cycles in housing prices across major EA cities. It also compares these cycles with selected Western countries and cities, and shows that, while EA cycles are of similar amplitude to Western cycles, they tend to be of shorter duration.

Based on national statistics, house prices have been relatively stable for the EA countries during the last decade of the global housing boom, compared with those of the US and European countries, which have often been significantly volatile. This finding is confirmed by comparing price movements along their long-term trends for the capital cities of EA countries with selected US cities (Los Angeles, Las Vegas, and Washington DC) using the Hodrick-Prescott filtering method.

In a revealing comparative graphical analysis, Chapter 7 then examines the individuality of national housing cycles and the specific dynamics of housing prices in each East Asian capital. Using the same methodology and a uniform format of presentation, this section identifies separately for each market housing price boom-bust episodes and changes in housing prices for periods as long as the housing price indices (HPI) of each country allow. Particular attention is given to the impact of the 1997–98 AFC and the 2007–2009 GFC. The housing markets graphically analyzed are:

- Seoul for Korea;
- Taipei for Taiwan;
- Singapore;
- Hong Kong;
- Tokyo for Japan;
- Beijing for China.

The final section of Chapter 7 examines the institutions and regulations that shaped the cycles presented in the previous section. It discusses the

channels of interactions between housing and the wider economy in the open economies that characterize East Asia today. It also identifies the six key players in their housing cycles, that are investigated in Part IV for China and for Korea. Given the major role of housing finance in cycles, we compare the key features of EA mortgage markets and discuss features of these mortgage markets that tend to increase price volatility. Chapter 7 also discusses the wide range of government interventions in East Asian housing, and examines the relationship between the extent of real estate regulations and the supply price elasticity of housing, and their impact on price volatility.

Chapter 8 complements the graphical evidence presented in Chapter 7, with econometric analyses of the drivers of EA price cycles. First, it reviews the shared conceptual foundations of housing cycle models. The next section quantifies the role of market fundamentals in EA price cycles. It compares unconditional measures of housing price volatility between East Asia and 15 Western countries, and also at the city level with US cities. Housing price models are estimated to investigate the quantitative impact of three variables representing market fundamentals: GDP as a proxy of household incomes, the user cost of capital in housing investment, and the ratio of residential investment. In the case of Korea, for which appropriate data are available, it is also possible to estimate the respective impacts of each of these three variables on the ratio of housing prices to rents in the Seoul Capital Regions and the rest of the country.

The third and final section of Chapter 8 is devoted to the analysis of two-way interactions between housing and the macroeconomy. It tests the Granger causality in each East Asian country between four macroeconomic variables: housing prices, GDP as proxy for income, the volume of credit and the level of long-term interest rates through Granger tests. Chapter 8 also tests for co-integration between these same variables, and compares the results for East Asia with those from a prior analysis for 16 OECD countries, to test the significance of housing in these economies. It also examines whether the dynamics of the housing sector and that of the macroeconomy significantly track each other.

1.3.4 Part IV: The six actors of housing cycles in China and in Korea

The third level of analysis of East Asian cycles investigates the distinct behavioral incentives of the six key players in housing cycles, and how their interactions may increase the risks of a boom-bust cycle. These six players are:

- the central banks, with their varying degree of monetary policy independence in setting monetary policies and interest rates in particular;
- the central governments, with their politically determined priorities in fiscal and also monetary policies;

- local governments, which play a major direct role in the regulation and performance of housing markets;
- households, with their savings behavior and critically important housing market expectations;
- banks and other housing lenders that collect household savings and fund investment in housing and related assets;
- real estate developers, who provide the new supply of housing.

This focus on the actors of cycles mitigates data limitations, helps to identify major sources of instability, and reveals factors behind the quantitative measurement of changes in the level of risk.

In contrast with the earlier supply-demand framework, the analysis of national housing cycles focusing on the six key actors of housing cycles leads to country-specific analyses. The two countries chosen are China and Korea, for almost opposite reasons. In the case of China, the focus on the six players in housing cycles can help overcome data gaps and housing price index quality issues. These were encountered earlier in the cyclical analyses that included only two megacities of the coastal region of China – Beijing and Shanghai – when the rapidly growing urban system of China is of continental scale and currently includes more than 660 cities. Here, the six actors are defined as operating nationwide and impacting these cities in different degrees. Korea is used as a comparator country, where we have full access to national data of known quality.

Studying China through the behavior of these six actors is especially needed because of the implicit assumption of standard quantitative cycle analyses, namely that the housing institutions of all the countries analyzed are fully market-based, stable and broadly comparable. This is not yet the case in China. The post-1998 structure of the new Chinese housing markets still reflect four important legacies from the administrative command system of the pre-1978 Maoist era, whose impacts on the dynamics of housing and of the entire urban system are now part of Chinese public policy debates. The duality of Chinese labor markets and urban migration patterns is shaped by the discriminatory *hukou* registration system.

The constitutional amendments of 1988, redefining property rights, have created an abrupt discontinuity between rural and urban property rights, which is deeply affecting urban land use, and housing in particular. Another lasting legacy of the central planning era is that local governments have a monopoly over land use, and typically continue to intervene in every land use decision, whether public or private. Another large distortion in local housing and other urban activities results from the very imbalanced allocation of mandated expenditures and revenue sources in the 1994 intergovernmental fiscal reforms of 1994, which has driven local government

into increasingly speculative activities and capital mis-allocation. The resulting hypothesis is that the transmission channels of shocks between housing and the macroeconomy may be different in China from the channels in the five other East Asian economies; and even more so from those encountered in advanced Western market economies, as recently analyzed by Muellbauer (2012).

A benefit from studying China in greater depth is to gain a clearer picture of the Chinese housing system at its critical growth transition between the just-completed economic take-off stage and the targeted, but still uncertain, move to a different path of sustained long-term growth. The focus on the key actors of cycles should facilitate our understanding of the channels of interactions between housing and the macroeconomy, which are very different in China from the usual channels of housing market systems. What can we learn about the likelihood in China of a very costly Western-style twin housing and banking crisis, like the Global Financial Crisis of 2007–2009? The degree of stability of the Chinese housing and real estate sector has become a global concern, now that China is growing into the largest economy in the world.

In the case of Korea, Chapter 10 first reviews housing stability in terms of both construction and price cycles, including three episodes of rapid price changes. Then we highlight key housing issues in a new era of deep socio-economic changes in South Korea. Having set this context, Chapter 10 then proceeds to the analysis of the six key players of cycles. It shows how the behavior of some of these players has changed significantly from earlier decades, and is bringing housing to a crossroads in terms of an adequate match between a rapidly shifting housing demand, with rapid population aging and a rising income inequality.

1.3.5 Part V: Conclusions

The concluding Chapter, 11, offers two perspectives. First, looking back, it sums up the lasting differences in the structure of EA housing markets, through their institutions and regulations that continue to shape East Asian housing cycles and make them distinct from Western cycles. It also reviews how different the dynamics of China's housing markets might be from the five other East Asian systems, based on the insights gained.

Looking forward, a significant part of the concluding chapter outlines five new structural challenges facing all six East Asian housing markets:

- The impact of rapid population aging on the composition and price dynamics of the housing stock.
- The worsening income and wealth inequality.

- Rising household debt levels; slower GDP growth rates.
- And climate change, with its differentiated impact on green growth management across high-income EA cities, where urban population growth and urban population decline will occur simultaneously in different parts of the national urban system.

How deep will the impact on housing of this new environment be, with so many unknowns never previously experienced anywhere in the world?