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### Publication Date

2014-06-01

**Housing Market Stability in China and the Potential for  
Global Contagion**

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**June 2014**

## Section 1: Introduction

China's economic growth story has become one of the iconic economic facts of our times. After growing at a double-digit rate for the last three decades or so, the economy has only recently started to slow, although the rate of growth still outpaces much of the western world. Rapid urbanization and massive infrastructure investments have been key elements of China's economic growth strategy. As a result, the real estate sector and housing in particular have played a major role in economic growth especially during the last decade and a half. Additionally, institutional changes, including privatization of housing in urban areas, 5-year plans to add millions of housing units to urban areas, a growing middle-class and a deep socio-cultural propensity for home ownership have helped the housing sector undergo a massive boom.

Over the last few decades China's economy has developed extensive linkages in trade, investment and financial flows with economies of the Asia-Pacific region, with the United States, Europe and the rest of the world. Given the size of the housing and real estate sector in China, any negative shock to that sector can result in serious consequences and a possibly contagion effect throughout the world, despite the fact that real estate is a non-tradable sector.

The most recent global financial crisis serves as a cautionary tale. Even though the epicenter of the crisis was the United States, there was a rapid propagation of negative shocks from the real estate sector in the US to housing and financial markets world-wide. The transmission channels were primarily financial but there were second order effects through trade, especially for small open economies. Above all else, however, the crisis of confidence, the spreading investor fears, the perceived heightened risk and infectious proliferation of panic, born out of a combination of the size of US housing and housing finance markets and the uncertainty regarding the depth, extent and linkages of exposures, resulted in a global financial and then economic crisis.

Is a similar scenario possible triggered by China's housing market? Is China at-risk of a housing market collapse? If so, what are the chances of the contagion spreading throughout the world? Answers to these questions lie in an understanding of the role of China's housing market in the context of China's economy:

1. How big is the housing sector in the larger economy?
2. How are the rest of the East Asian economies linked to China's housing market and to China's broader economy?
3. What would be the likely consequences of a housing market correction in China on the Chinese economy and on neighboring economies.

Following this introduction, the paper includes 6 sections. Section 2 provides an outline for the exercise by drawing on the experience of the last global crisis to describe the different routes through which the housing market in China may be linked to the Chinese economy and institutional setting, neighboring housing markets and economies, and the rest of the global real estate market and economy. This section also describes the unique characteristics of the Chinese housing market that are likely to affect its level of vulnerability to overheating. Section 3 draws from recent research on China's housing market, including both reports of trends in construction and prices and analyses that address the question of the "heat" of the Chinese housing market. Section 4 examines the Chinese housing market and broader real estate sector in the context of the Chinese economy. Section 5 delves further into two distinct characteristics of the Chinese housing market—the role of government entities and the financials structure. Section 6 describes and assesses linkages external to China, dividing the discussion into three types of economic relationships—those with closely allied economies such as Hong Kong, those with close trading partners within the Asian region, and other relationships (which are discussed largely conceptually). Section 7 concludes by summarizing the evidence for and against a housing market collapse and the likely effects of

current and future trends in China's housing market on the country's economic relationship with other parts of Asia.

## **Section 2: The Recent Global Financial Crisis: Reviewing Characteristics of Contagion from an Overheated Housing Market**

The sequence of events that led a small segment of the housing market in the United States to bring the global financial system to the brink of collapse is a useful starting point for developing a framework in which to consider the risks of an overheated housing market. We briefly describe these characteristics below, as a framework for considering the linkages from China's housing market and economy to broader economic conditions.

Several different factors drove housing demand during the housing bubbles that built up in both the US and Europe. There was much less evidence of housing bubbles in many other parts of the world, as described in Bardhan et al 2012. Key factors, as described in Bardhan, Edelstein and Kroll 2011 include:

- Pent up demand among low to moderate income buyers who had difficulty in earlier periods qualifying for loans and among households in countries where incomes were rising and unemployment dropping, as in Ireland.
- Perceptions about the advantages of housing investment, in particular that it was a more reliable alternative than the stock market (following the dot-com bust) and that home prices were not likely to drop, and could be counted on to rise in the long term.
- "Flippers" seeking rapid gains from appreciation.
- Cross border demand, such as investment by Northern Europeans in condominium units in Spain.

Housing finance was a driver of both demand and supply. Critical factors included loosening loan standards, new players in lending, and broadening secondary markets for loans with new securities and derivatives

- Changing loan standards allowed lenders to offer mortgages to the potential homeowners representing "pent up demand." A drop in loan to value ratio, low document requirements allowed households to purchase more expensive homes and marginal households to enter the for sale housing market.
- Many of the largest and fastest growing lenders during the build-up of the bubble in the US were new entrants operating outside of the banking regulatory environment. In Spain, small local lending institutions began to finance multifamily (condominium) projects for developments aimed at an international market—an area of business entirely outside their previous experience (Sureda-Gomila 2012).
- In the US, both of these practices became possible because broadening secondary markets provided the resources for passing subprime loans from original lender to a different pool of investors seeking higher returns. Loans were packaged in the secondary market into instruments whose rating was higher than the quality of any single loan.
- Investors worldwide purchased instruments ranging from relatively safe US Agency bonds (over 4% of which were held by China alone in 2006) to much riskier packages built around subprime loans, to hedging instruments and "betting" investments that would pay off if the original investments failed (see Bardhan and Jaffee 2007).

### *Government Regulation:*

Regulation failed to dampen the speculative nature of the bubble from several directions (Bardhan, Edelstein and Kroll 2012):

- Less stringent regulations were permitted on mortgage guarantees.
- Many mortgaging entities did not fall under banking regulations

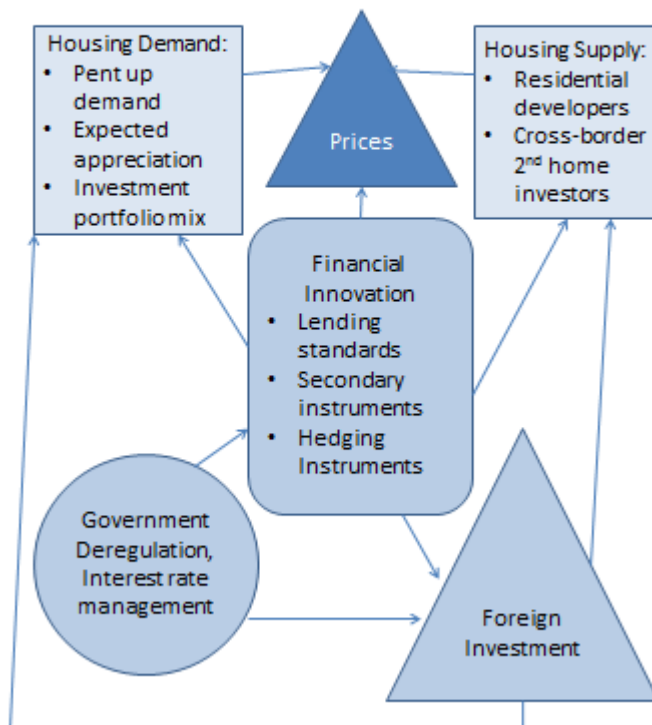
- Rating agency oversight was weak.
- Previous restrictions on risky banking practices (such as increasing involvement in investment functions) had become casualties of earlier periods of deregulation.
- Economic policies maintaining low interest rates, which further fueled housing demand and price growth.

*Broader Economy and Global Linkages:*

Links to the broader economy went through several channels, as shown in Figure 1:

- Provision of new housing supply to meet growing demand expanded the demand for construction workers and materials and finance industry employment, as well as goods and services demand related to growing salaries.
- Rising real estate values created wealth effects as consumers borrowed on growing equity in their homes for a wide range of investments, purchases, services and activities.
- Financial institutions took advantage of the expanding range secondary instruments to extend commercial and corporate credit as well residential.
- Commercial developers and corporations relied on ease of financing and refinancing, and sought funds from a growing pool of international investors. Borrowers then became vulnerable both to tightening credit and exchange rate risk as individual financial institutions and the global economy weakened.
- Global trade and financial linkages, financial market contagion, demonstration effect and investor fears all contributed to worldwide contagion.

**Figure 1**  
**Economic Linkages Between the Housing Bubble and Financial Crisis**



Setting the stage for the discussion that follows, Table 1 compares the current circumstances in China with the US and European earlier experience. Some of the key characteristics that both link and distinguish the circumstances include:

- The sense of hidden and expandable housing demand. In the US, this took the form of lower income and move up borrowers whose demand could be tapped by expanding access to credit. In China the process of urbanization leads to rapidly expanding demand in cities. In both cases investors responded, expanding the pace of demand growth. Yet each also has albeit very different limits to this flow. In the US, there were limits to pent up demand and to the ability of lower income borrowers to keep up with payments; in China, the hukou (geographically restricted household registration system), one-child policy, and other government restrictions limit the rate at which household occupancy may expand.
- In the US and Europe the private sector drove the growth in supply, while in China government land sales, state-owned deep-pocket developers and outside investors all contributed to the heating up of the pace of supply growth.
- The US and some European countries saw massive loosening of the lending system, from new unregulated or lightly regulated mortgage providers to traditional lenders loosening standards to better compete against new entrants, to creative investment vehicles which allowed lenders to pass on risky loans to investors seeking higher yields. The Chinese financial system is much less expansive. Chinese regulation is quick to tweak lending standards and restrictions in response to economic conditions. At the same time, household savings plays a much larger role in the growth of investment in housing, as savers seek safe investments with the possibility of growth.
- Both systems led to linkages between the housing market and the broader economy. The nature of the linkages in China and from China to the rest of Asia and globally are the subject of this paper.

Factor	Housing Bubble and Financial Crisis	Chinese and Asian Housing Markets, 2007-2014
Housing Demand	<ul style="list-style-type: none"> <li>• Pent-up demand-- lower income borrowers;</li> <li>• Move-up of previously credit restricted borrowers</li> <li>• Investors anticipating quick appreciation</li> </ul>	<ul style="list-style-type: none"> <li>• Rural to urban migrants</li> <li>• One-child family affects initial and future generations</li> <li>• Investment vehicle               <ul style="list-style-type: none"> <li>○ Within China</li> <li>○ Across borders</li> </ul> </li> </ul>
Housing Supply	<ul style="list-style-type: none"> <li>• US, UK, Ireland: Developers responding to expanded pace of growth</li> <li>• Spain: Investment in second homes</li> </ul>	<ul style="list-style-type: none"> <li>• Local government land sales</li> <li>• Government deep pocket developers</li> <li>• Asian developers investing in Chinese multifamily real estate</li> </ul>
Finance	<ul style="list-style-type: none"> <li>• New entrants to mortgage lending</li> <li>• Existing lender adjustment of product and standards</li> <li>• New participants, vehicles in secondary market</li> <li>• Europe: Cross country loans; cross country investment in secondary products</li> </ul>	<ul style="list-style-type: none"> <li>• Role of multigenerational or multifamily savings</li> <li>• Expanding mortgage banking</li> <li>• Introduction of provident funds tied to housing investment</li> </ul>
Government Regulation	<ul style="list-style-type: none"> <li>• More mortgage entities outside of banking regulation</li> <li>• Guarantees expanded to new products</li> <li>• Lax oversight by rating agencies</li> </ul>	<ul style="list-style-type: none"> <li>• LTV used as policy vehicle to heat or cool market</li> <li>• Number of loans regulated</li> <li>• Regulations in neighboring countries</li> </ul>

	<ul style="list-style-type: none"> <li>• Deregulation during previous decade</li> </ul>	regarding outside investment in housing
Broader economic linkages	<ul style="list-style-type: none"> <li>• Direct employment and income and employment multiplier effects of construction</li> <li>• Real estate wealth effects</li> <li>• Commercial loans</li> <li>• Global financing of financial institutions and other businesses</li> </ul>	<ul style="list-style-type: none"> <li>• Direct employment and income and employment multiplier effects of construction</li> <li>• Real estate wealth effects</li> <li>• Commercial loans</li> </ul>

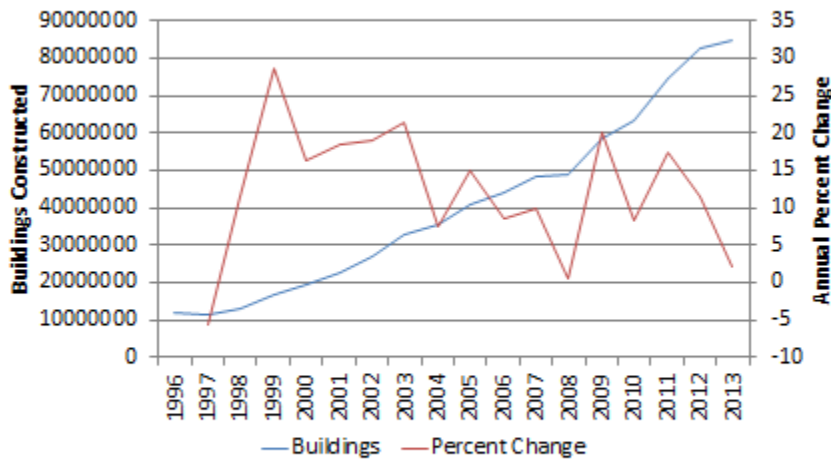
The sections below focus, in some detail, on the Chinese housing market’s supply and demand, finance system, government regulatory activity and economic activity.

**Section 3: The Housing Market in China: Recent Developments**

Since the year 2000, the scale and pace of China's urbanization and demand for housing has been nothing short of extraordinary. As documented in Wu and Ma (2013), this process is generated by a mixture of global economic forces and internal institutional restructuring, affecting basic demographics, migration patterns, institutional support of development, and housing provision models. According to China's Census figures, urban population increased by 253 million between the year 2000 and 2013. Household formation, job creation and wages and other demand side factors have been robust in urban areas. Real urban wages having quadrupled since 2000, and on average about 11.6 million jobs have been created annually in urban areas since 2000. (authors from China data online). This demand is being met with robust supply side developments. Building construction, as measured by the number of new buildings, increased in most years, as shown in Figure 2, based on data reported by OECD. In terms of square footage, the National Bureau of Statistics reports that in the first ten months of 2013, the floor space under “construction by the real estate development enterprises accounted for 6,164.65 million square meters, up by 14.6 percent year-on-year, ... Of which, the floor space of residential building construction area was 4,518.67 million square meters, up by 12.1 percent.” Residential floor space completed was 464 million sq. meters, somewhat lower than in 2012, but still accounting for about 5 million new apartments. On average, more than 60 cities out of 70, in any given month have shown significant price rises, year over year, with double digit growth in large mega-metros, such as Shanghai and Beijing. Even with the rapid pace of new construction, 69 out of 70 cities had housing price increases between December 2012 and 2013.

Figure 2

## China Annual Building Activity



Source: OECD Main Economic Indicators-complete database  
<http://dx.doi.org/10.1787/data-00052-en>, as published on  
<http://research.stlouisfed.org/fred2/categories/33107>.

Urbanization is seen as a key component of China's economic growth strategy. It is also seen as integral to the restructuring of China's economy away from investment driven growth to consumption led, fueled by significant increases in the urban middle class. Census figures show China's level of urbanization grew from 37% in 2000 to 50% in 2010, and an estimated 52% by 2012. Over time this has sharply raised expectations for consumer demand and related economic growth. Li Keqiang, China's present Prime Minister pointed out,

...statistics show that the urbanization rate of developed countries has reached 80 percent, and some developing countries with similar average income levels to China topped 60 percent... urban residents spent 3.6 times more than rural dwellers in 2010, with the average annual consumption of urban and rural residents standing at 15,900 yuan (US\$2,525) and 4,455 yuan (US\$707) respectively. Based on those figures, it is estimated that every rural resident who becomes an urban dweller will increase consumption by more than 10,000 yuan (US\$1,587). And each one percent increase in the urbanization rate in only one year will see more than 10 million rural residents absorbed into the cities. This will, in turn, translate into consumption totaling more than 100 billion yuan (US\$15.9 billion) ([http://www.china.org.cn/china/2012-03/04/content\\_24801231.htm](http://www.china.org.cn/china/2012-03/04/content_24801231.htm))

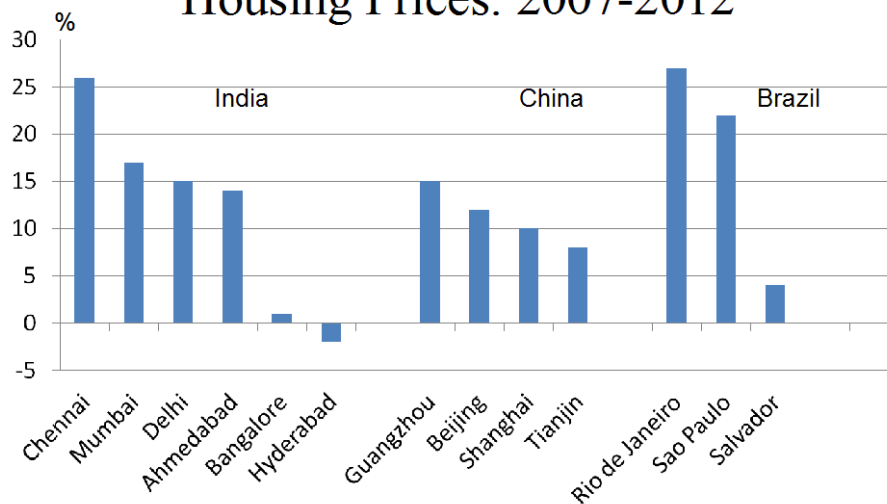
With 15-20 million migrating to cities each year, and about 400 million more over next couple of decades, the pressure on urban services and housing is enormous. While the continuing influx of migrants has spurred the urban economy it has also made homeownership for new households increasingly unaffordable, prompting serious measures for construction of affordable, government-subsidized apartments. Other potential reforms on the agenda that are having, and will have an impact on the housing market in the future are: delinking access to public services from a citizen's hukou or urban residential permit; introduction of property taxes and developing a nationwide social security system.

While housing prices have been growing rapidly in many Chinese urban centers, is this phenomenon very different from that in many other emerging economies, where somewhat similar forces are at work? Figure 3 shows average annual house price increases for a sample of cities from China, India and Brazil.



Figure 3

### A Comparative Picture: BIC Average Annual Growth Rate of Housing Prices: 2007-2012



Source: NHB, NSB, CBRE; Note: US over same period -3%, UK -1.5%, London +1%,

The Chinese house price growth rates do not look inordinate placed in that context, but are extraordinary when juxtaposed with housing market dynamics in developed countries over the same period, when prices were static or dropping. A more relevant question is whether these house prices can be reconciled with economic fundamentals, or, is there a “bubble”, in the sense of the prices diverging from what the underlying economic drivers would determine?

Chen et al (2103) probe whether a bubble existed in the Beijing housing market from 1998 to 2010, by taking into account some macroeconomic variables, such as interest rates and inflation, and cost of housing supply. Their results indicate that “the Beijing house price index was significantly larger than the equilibrium value, based on the relative economic fundamental variables (income, inflation, interest rate and construction cost) during 2004 to 2007. This result is similar to the findings of Hou (2009), where nearly 75 percent of the changes in Beijing house price were thought to be explained by the economic variables used in the models.” It should be noted, however, especially in the latter case, that these studies ultimately show that fundamentals, as defined by the authors, do not completely explain the house price changes, and the residual could be interpreted by some as a bubble measure.

Ping, Zhen and Xu (2012) point to several indicators that Beijing housing prices were out of line with fundamentals between 2007 and 2009, when their data ends. According to their study, the price to income ratio rose from six in 2004 to ten in 2009, while housing prices rose much more quickly than rent during this period. They describe evidence of “overfluctuation,” beyond what could be explained by fundamentals.

Ahuja et al (2010) of the IMF are somewhat more sanguine, and find that, for China as a whole, the “current levels of house prices do not seem significantly higher than would be justified by underlying fundamentals. However, there are signs of overvaluation in some cities’ mass-market and luxury

segments.” They also note, together with many other scholars and observers, that prices have tended to correct frequently in China, at regular intervals, thus avoiding a sustained, unrestrained growth path. They conclude that “given persistently low real interest rates, lack of alternative investment and mortgage-to-GDP trend, rapid property price growth in China has, and will continue to have, a structural driver.” Gregory Chow and Linlin Niu (in Man, 2011) apply consumption theories and conclude that ‘the past increase in the price of urban housing in China was the result mainly of increase in income and not of speculation’, and ‘a housing bubble did not occur during our sample period up to 2006’ (p. 58).

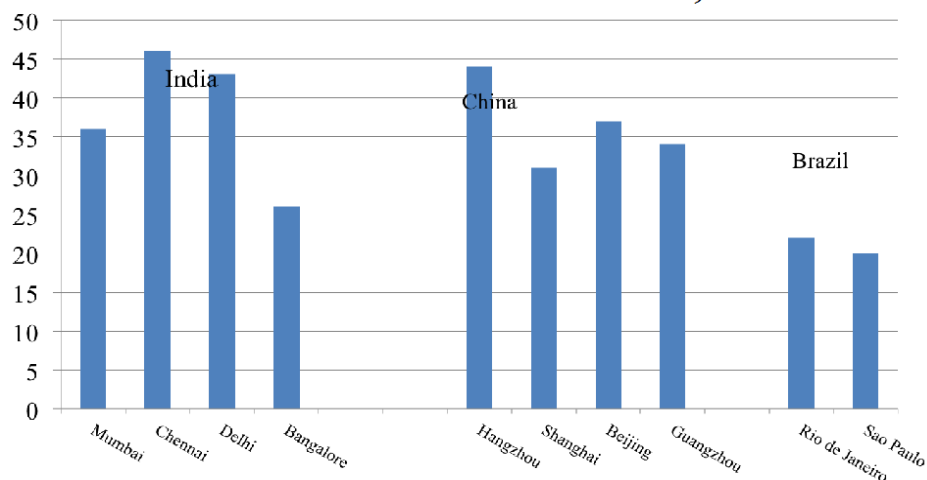
It should be noted that the “bubble” literature is a work-in-progress, with many of the papers dealing with somewhat old data, while the prices have continued to grow at a fast clip. The Chow and Niu conclusion, for example, is not inconsistent with the evidence found by other authors of overvaluation of housing between 2007 and 2010.

Price-to-rent and price-to-income ratios are critical in gauging froth in the housing market. Wu, Gyurko and Deng (2012) develop a quality adjusted land value index in Beijing and note that “real, constant quality land values have increased by nearly 800% since the first quarter of 2003.” They note that price-to-rent ratios in Beijing and seven other large markets across the country have increased by 30% to 70% since the beginning of 2007. Even with extremely low holding costs in the range of 2%–3% of house value, there must be widespread expectation of very high appreciation for people to be paying these exorbitant prices. The authors suggest, therefore, that “even modest declines in expected appreciation would lead to large price declines of over 40% in markets such as Beijing, absent offsetting rent increases or other countervailing factors.” (Page 531). They do not give equal credence to the price-to-income ratios, which are very high in select markets, because urban income growth has been equally strong in many markets.

Given the higher real interest rates in emerging economies, the high price/rent ratios (see Figure 4), or the low implied cap rates suggest an extraordinary buoyance in the market. In many individual markets in emerging economies a large number of houses and apartments are bought, locked up and not released into the rental market; in other words, the real, market rents are probably even lower and the ratios even higher. (See Fawley and Wen 2013 and Stevenson-Yang 2013 for discussions of vacant units in China).

Figure 4

## A Comparative Picture: Fair Value or Speculative Fervor? City Center Price to Rent Ratios, 2013



Source: Numbeo data aggregators; IMF; JLL; In comparison – US average 11.5, UK 18

The price income ratios for China seem to be significantly higher than even those of other emerging economies. (See Figure 5). This is both a result of very high savings rates and hence a capacity to face significantly higher prices, as well as lack of credible investment alternatives. The Shanghai stock market has been mostly stagnant, the domestic bond market is barely in its infancy, and most bank deposits, CDs, and similar accounts pay rates just a tad above inflation, if that. High house price-to-income ratios suggest that expenditures on other goods, services, and investments are very low as a share of disposable income. Consumption in China, as we know, is lower relative to incomes when compared to most other emerging or developed economies (Hung and Qian 2010).

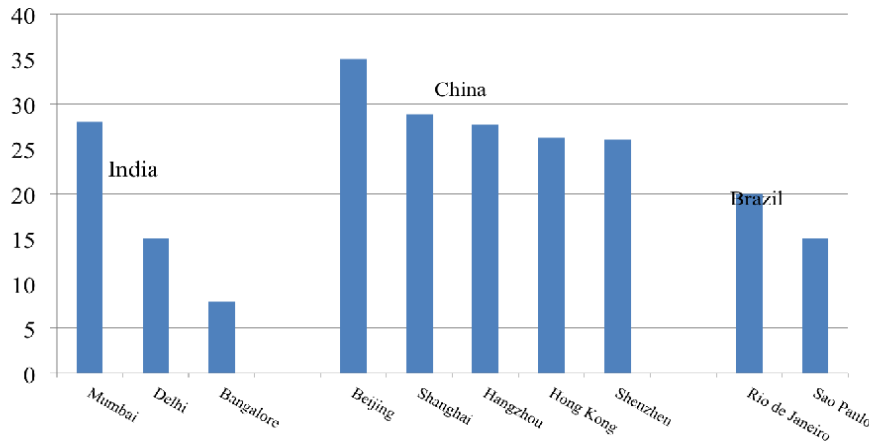
Figure 5

Dreger and Zhang (2013) detect cointegration between real house prices and a set of macroeconomic determinants including a fiscal stimulus package and massive credit expansion. They find that “The results indicate the presence of a house price bubble. At the end of 2009, real house prices are 25 percent above their equilibrium value. However, heterogeneities are striking across the country. The bubble is especially pronounced in the cities of the southeast coastal areas and the special economic zones.” They conclude, however, that the bursting of the bubble will likely have only modest effects on the real economy, because private household expenditures do not show signs of being closely tied to housing wealth. This is in contrast to the US, where the ease of drawing equity out of a home through borrowing led to a close link between housing wealth and consumer expenditures.

Drawing from these disparate analyses, we conclude there is clear evidence that Chinese housing prices are high compared to fundamentals. However, the implications of this depend on the size and extent of integration of housing into the economy and the role of government policy in “managing” the overheated markets. These questions are addressed in the next two sections.

Figure 5

## A Comparative Picture: How Unaffordable is Housing in BICs? Price to Income Ratios, 2013



Source: Numeo data aggregators; IMF; In comparison – US average for 72 cities is 3, UK 6.5

### Section 4: Housing Market and Real Estate in the Context of China's Economy <sup>1</sup>

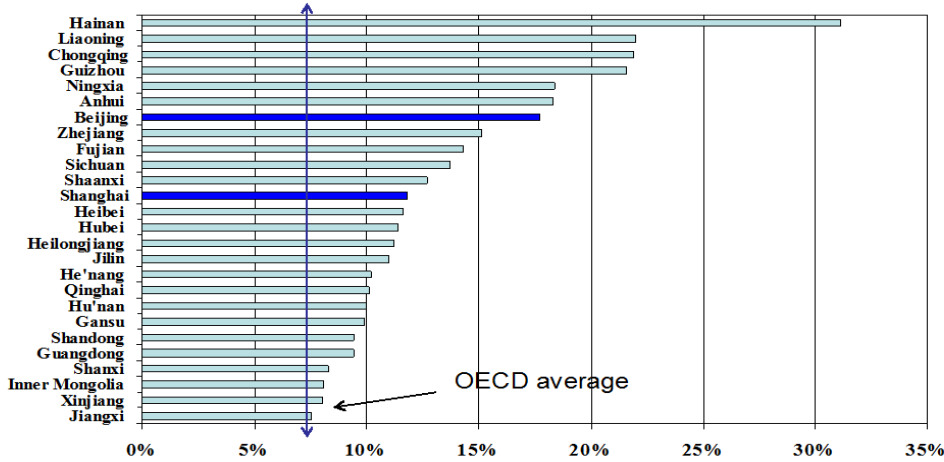
Housing has been one of the key growth sectors of the Chinese economy in the past decade (C-5). The sector has many channels of impact on the economy. Land development associated revenue is the source of about half of local government revenue. About one third of banking credit is concentrated in real estate. While construction activity creates employment and the demand for materials such as steel.

In order to situate China's housing market in the context of China's economy we need to get a sense of how large housing and real estate are in the economy. In the United States, there are two ways of looking at the question. First, evaluating investment expenditures in housing and real estate. Second, evaluating expenditures that go into consumption in national accounts. In terms of investment, the share of private domestic residential fixed investment and nonresidential fixed investment in structures has ranged from 5 to 10% of GDP in the U.S. Housing related consumption expenditures account for around one sixth of total household expenditures of income after taxes. Housing and real estate are therefore a very large part of the US economy. A similar rough exercise for China is difficult to carry out for data availability reasons, but estimates suggest a 50% larger share of real estate in GDP relative to the US due to significantly higher investments and a higher share in household expenditures because of inflated prices. Figure 6 shows real estate development and related expenditures as a share of GDP for 26 Chinese provinces. With Hainan leading the pack, all have a higher share than the average for OECD countries. (Figure 7 shows the relative size of housing investments only for the nation as a whole).

<sup>1</sup> We conducted over 30 informational interviews with close to 60 individuals (many interviews included more than one expert). The respondents shared frank assessments of the situation with the understanding that the information would be used to inform our understanding but not directly quoted. The interview types are listed following the references, with codes for each interview. In a few cases, our statements come from material learned in the interviews, or interview comments embellish findings from other sources. In these cases, we cite the interview by code to give a sense of the source of the information.

Figure 6

## Real Estate Development as Share of GDP Chinese Provinces 2012

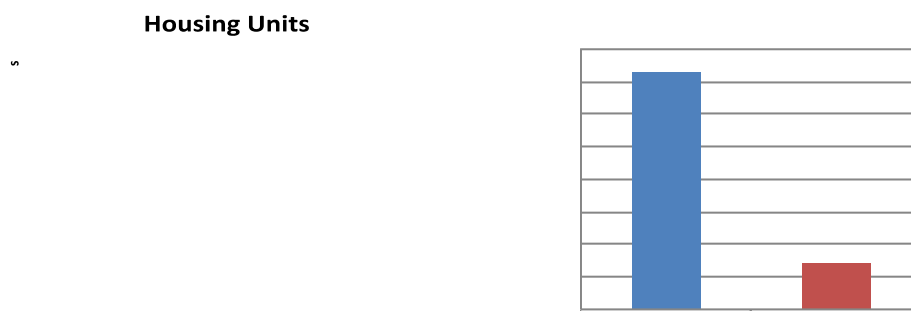


Source: All China Data Center, chinadataonline.org

In addition to the demand side drivers mentioned above, such as rapid economic growth and massive urbanization (C-6), a number of other characteristics of the economic system and economic history tend to give a fillip to demand. While household and extended family savings still play a dominant role in financing home purchases, there is an emerging housing finance system with a range of mortgage products; as in other emerging economies, there is pent-up demand and a backlog for decent housing; the absence of a property tax lowers the carrying cost of housing and makes it more attractive, especially as an investment; and as pointed out by the Economist Intelligence Unit (EIU, 2011), among others, the small household size in China (3.3 persons, 2.8 for urban households) tends to add to housing demand, everything else being equal. The social pressure faced by bridegrooms and their families in China in providing an impressive, new home to bring the newly-weds to translates into another related demand boosting anomaly – per capita living space in the country is very high for a low-middle income country that is very heavily populated and with high density in many urban areas. EIU calculates the per capita living space to be nearly at par with Japan, and a bit lower than in the UK.

Figure 7

## Investment in Fixed Assets(Excluding Rural Households) (2012)



Source: National Bureau of Statistics of China

### Section 5: Some Distinctive Regulatory and Financial Features of the Housing Market in China

As with demand, a number of supply side attributes of the housing/real estate system are specific to China and have a bearing on market outcomes. The role of government, especially that of local governments, is the key defining attribute of land markets in urban China. Urban land belongs to the state. As pointed out by Bertaud (2012), the local government acts as both the regulator and monopolist land developer as well as a monopsonist land acquirer. Local government finances and their capacity to develop urban infrastructure depend on their ability to develop land and to regulate urban housing and commercial markets. Local governments are also the battering ram for carrying out the central government's economic programs, whether in the field of provision of affordable housing, in carrying out macro-prudential administrative guidelines or industrial policy. (See Lu and Sun 2013 for further discussion of the position of local government in the finance, development, and public policy arenas).

The increasing unaffordability of housing has prompted both local and central governments to increase their role and intervention in housing markets. The 12th five-year plan called for 36 million affordable housing units to be built ("social housing"). Prices are controlled within the social housing sector, with very little cost increase as compared to the private housing sector (C-1). As pointed out by Zhang and Rasiah (2014), state-owned enterprises in China have also played a role in the housing sector. These interventions can be divided into three different phases starting with the reforms in 1978. From being first producers and providers, then distributors and privatizers of proprietary housing-stock, now, in the most recent phase since 1998, the state owned enterprises have expanded their activities to become developers, investors and speculators in the housing market. Divisions between the phases are not distinct, however. Some state-owned enterprises are still in the business of providing and promoting affordable housing for some of their employees, albeit at a much reduced level, and also function together with local governments in the production of affordable housing. From the point of view of housing market outcomes, while a hukou mitigates demand pressures through distortionary restrictions on migrants,

affordable housing is attempting to relieve market pressures on the supply side. It is not entirely clear that either succeeds; in any case, the jury is still out on the latter.

Heightened roles for local governments in housing markets have also led to a propensity to micromanage and fine-tune the local housing market at every turn. The temptation to do so is enormous because of the need to accommodate various interest groups. Unlike US banking and finance authorities, who adjust market mechanisms, the Chinese authorities employ both market tools, such as interest rates, and prudential and administrative measures. Even in the sphere of market tools, China has a dual-track interest-rate system, with bank deposit and lending rates being regulated, and money and bond rates market-determined. The central bank also imposes an indicative, but non-binding target for total credit in the banking system. He and Wang (2012) show that, “market interest rates are most sensitive to changes in the benchmark deposit interest rates, significantly responsive to changes in the reserve requirements, but not particularly reactive to open market operations,” finding that this helps explain “why the central bank conducts monetary policy in China the way it does, using a combination of price and quantitative instruments with differing degrees of potency in terms of their influence on the cost of credit.”

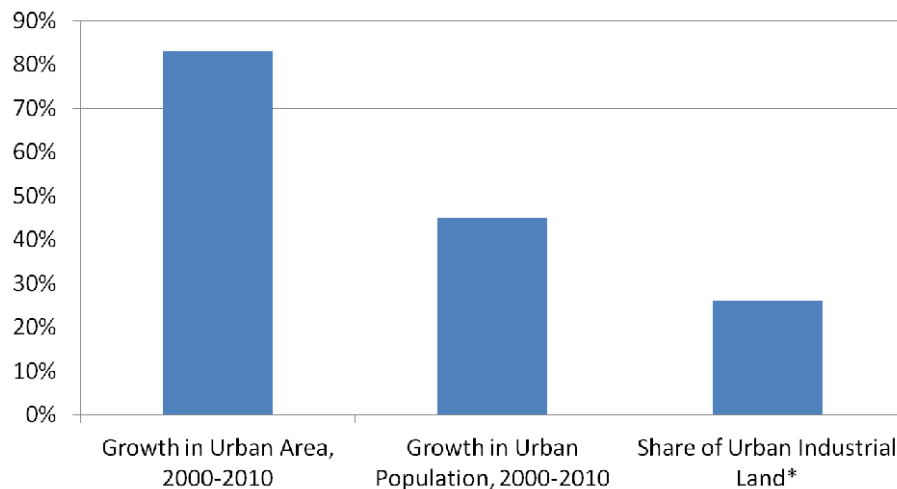
Administrative measures on monetary and banking guidance have included instructions regarding mortgage availability, loan to value rates, advisories about housing supply to developers, and direct quotas and limits on credit provision by Banks, in addition to the standard macro prudential measures introduced from time to time by the central government and by the People's Bank of China. The fine-tuning has resulted in large swings in the housing market, as noted by Chen (2012), and has made the housing market perhaps more volatile than would otherwise have been the case.

But how effective is monetary policy in terms of controlling, taming or boosting the housing market? Using quarterly data from 1998:Q1 to 2009:Q4 and monthly data from July 2005 to February 2010, Xu and Chen (2012) examine the impact of key monetary policy variables, including long-term benchmark bank loan rate, money supply growth, and a mortgage credit policy indicator, on real estate price growth dynamics in China. Their results “consistently demonstrate that expansionary monetary policy tends to accelerate the subsequent home price growth, while restrictive monetary policy tends to decelerate the subsequent home price growth.” They also note that hot money flows do not have a significant impact on the change of home price growth after controlling for money supply growth and that a bullish stock market tends to accelerate subsequent home price growth. It should be noted that since both expansionary and contractionary policies are accompanied by guidelines, indicative quotas and other administrative measures, the effectiveness refers to the overall combination of measures. Ultimately, it should be emphasized that the housing market does seem to be somewhat responsive to the package of measures, both in expansionary and contractionary modes. At least in the case of the housing market, it is not just pulling and pushing at the string, as monetary policy is frequently described elsewhere in developed countries, but rather pulling on a string and pushing on a stick—the Chinese government may, for example, restrict purchasing activity directly for some buyer types, such as investors.

Direct participation by government in urban land markets also distorts market prices. The strategy of subjugating urban land policy in the service of broader strategic, industrial and economic goals for the country as a whole has resulted in a significant outcome - intensive consumption of land by industry and manufacturing. Relative to other countries, Chinese cities and metros allocate a far greater share of urban land for industrial usage, in comparison with land for residential purposes. See Figure 8. The net result of this land policy is to skew the land market in such a way, that in equilibrium housing prices are higher.

Figure 8

## China: Urban Land Usage



Source: China Daily; Ministry of Land and Resources

Note: Global developed country average between 10% -15%

In addition to macroeconomic and land use policy, the Chinese financial system plays a role in stimulating and at times dampening the housing market. As introduced earlier in Section 2, the Chinese financial system encompasses a very different set of linkages with the housing market and the larger economy than existed in the US during the housing bubble or subsequently. The integration of the US housing markets with domestic and global financial markets played a major role in the severity, contagion and geographic spread of the crisis. Most houses in the US are bought with mortgages, and at the peak of the housing bubble total mortgages outstanding as share of GDP was over 90%. Additionally, there was widespread securitization, and many customized, over-the-counter derivatives of underlying home mortgages. Moreover, US financial markets are well integrated with global financial markets. These two attributes of the US housing and financial system were significant factors in the previous financial crisis.

In China, total mortgages outstanding as share of GDP while growing steadily from negligible until late nineties has stayed steady at about 15% since 2010. Most of the financing comes from savings (C-3), employer connected housing provident funds (Deng et al 2011) and private speculative sources. Other features of the financial system, which tend to insulate the broader financial markets from shocks to the housing market include: generally low loan-to-value ratios, in the region of 60%; mortgages are mostly variable rate and recourse loans; and there is very little mortgage securitization to speak of. Moreover, with strict capital controls and a non-convertible currency the linkages to global financial markets are limited. The parties that will be most adversely affected in case of a severe housing market downturn, therefore, are private investors, the shadow banking structure with its off balance sheet investment vehicles for high net worth individuals and firms, rather than banks.

This is not to discount the potential effects on individual Chinese households who have invested in private market housing units (as opposed to social housing). This might be as an investment in housing for the only child of the third generation (C-2) or as a form of savings for households already occupying a



unit that they own. These households would face the prospects of a sharp drop in the value of their primary asset(s) should housing prices recalibrate (C-4). To the extent to which more recent units purchased involved savings (Deng et al 2011), the loss in house value would have a direct impact on household wealth and could spill over into consumer spending as households try to recoup their “nest egg” through further savings. To the degree that the use of mortgages from the banking system is increasingly important in purchasing homes, impacts of a downturn in value would be felt both by investors carrying mortgages on second and third homes and by the institutions financing these mortgages. Analysis by CB Richard Ellis in a 2013 review of Chinese real estate conditions points to both the high level of savings (\$35 trillion in 2011, more than double the level of 5 years earlier) and low loan to value ratios hovering between 40 and 60 percent as evidence that the direct exposure to the housing market downside is domestic—accruing to individual households and in some cases Chinese banks, rather than the global financial system.

Indirectly, the shadow banking system has emerged as a much greater risk, and one that has linkages to the real estate market from more than one direction. Official statistics on shadow banking are rare, but the financial press is replete with descriptions of issues surrounding the shadow banking system, and discussions of the possible consequences of these issues on the broader Chinese economy and beyond.<sup>2</sup> (See Boone and Johnson 2014, Gough and Bradsher 2013, Guilford 2014, Kim 2014, Peston 2014, Rapoza 2014). In many ways the shadow banking system in China is reminiscent of the subprime loan bubble in the US but with significant differences. Like the US subprime system, the shadow banking system provides higher returns to investors by investing in risky enterprises, from real estate development to corporate borrowing, which would not be eligible for loans directly from state banks. The amount of debt that has been lodged in investment vehicles such as wealth management products has snowballed, growing at almost 70 percent per year since 2010 by some estimates (Guilford 2014). A securitization-like process has followed. As debt has expanded, according to Gough and Bradsher 2013, “A complex and loosely regulated network of financial go-betweens has sprung up to profit from repackaging and reselling China’s new mountains of debt, turning loans into investment products.”

Unlike subprime lending, the funds are extended directly to real estate developers and corporations (as opposed to homeowners and homebuyers)—playing a direct role in propping up strong growth rates in China (Boone and Johnson 2014). Another important difference is that investment is more contained within China. The impacts of a collapse of the shadow banking system within China, however, could be widespread, from the “ordinary investors” seeking higher interest rates (Gough and Bradsher 2013) to the developers who borrow to construct new housing (C-3, C-4), to the many local governments relying on a chain of lending that includes shadow banking to finance their real-estate related income flows and public infrastructure fiscal stimulus investments (Guilford 2014, Rapoza 2014).

The concentration of investors in shadow banking products within China suggests that the global financial system should be less exposed to collapse of these financial products than they were to the highly leveraged subprime networks. However, China is integrated into the global economy through a number of other linkages, as described and assessed in the following section.

## **Section 6: International Linkages and Contagion Prospects**

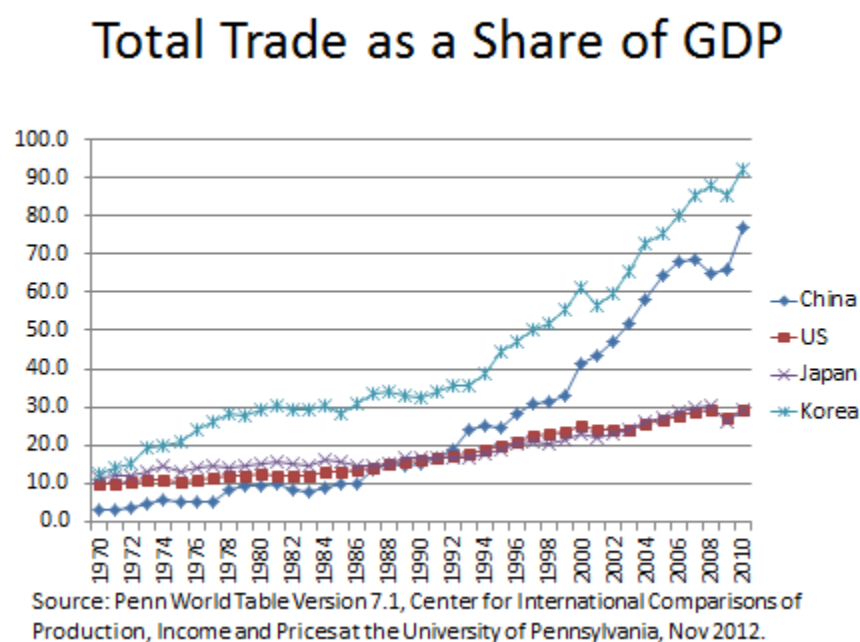
In terms of trade and investment, China has gone from being one of the world’s most closed economies to being one of the more open of the large economies. (See Figure 9). Total trade as a share of GDP was around 48% in 2012, as compared to 25% for the US. In the year 2013, China attracted \$117.6 billion

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<sup>2</sup> Bardhan, Hicks, Kroll and Wu (20--) conducted research suggesting that such flurries of “warning” articles were often precursors to a crisis in the making.

dollars in foreign direct investment . The extent of China's purchases of US treasuries bonds and its other investments, and the recycling of foreign currency reserves into various investment instruments abroad is discussed in Bardhan and Jaffee 2007. It is true that the currency is still nonconvertible and that there are capital controls. However, there has been a steady, secular trend towards more openness in both the economy and the financial sector.

Figure 9



The level of economic integration and financial linkages among greater China economies of Hong Kong, Taiwan, and Mainland China, and also with other Asia-Pacific economies is particularly intense. China is now the largest trading partner of practically every economy in East Asia. Cross border capital flows, production networks, region-wide supply chains, and investment flows are all particularly extensive in the East Asian region, so much so, that there has been conversation about the need for an Asian currency zone (Chino 2004 and Sheng 2010). Academic research on the linkages and ties on capital mobility and business cycle correlations between and among countries of the region have pointed in the direction of a very high level of economic and financial integration, as described below. Region-wide contagion and shock propagation is therefore a real possibility, especially through trade channels. Put simply, East Asia is the most dynamic economic region in the global economy and in addition to its internal integration, its extensive trade and financial integration vis-à-vis the rest of world makes it a critical component of global economic health.

There is a growing body of research on integration in the East Asian region. Some of the research focuses on linkages in goods markets, while other papers analyze integration of financial markets in the region. Jeong (2012) examines the linkages and mutual influence between three Northeast Asian stock markets of China, Japan, and Korea during the period between January 1, 2000 and September 30, 2010, including the global financial crisis period of 2007-2009. His conclusions are that, “Firstly, China is influenced more by regional markets rather than the global market. On the other hand, Japan is influenced more by the global market rather than regional markets.” The latter finding is not surprising given the myriad

financial linkages between Japan and global markets, as well as its open capital account and convertible currency. Jeong also argues that the recent global financial crisis has caused a shift in the pattern of integration in the region with all three countries show a higher level of integration with the global market after the financial crisis. Worthington and Higgs (2012) select a broader range of countries and measure the extent of financial market integration among Asian equity markets from January 1993 until December 2010. With three developed (Hong Kong, Japan and Singapore) and eight emerging countries (China, India, Indonesia, Korea, Malaysia, the Philippines, Taiwan, and Thailand) in their sample, they find that, “there is a stationary long-run equilibrium relationship among, and significant and substantial short and long run causal linkages between these Asian equity markets” They also conclude that the least influential markets, in terms of affecting and influencing others through causality tests are China and India (p.57)

Using a variety of time-series techniques on data on a broad group of Asia-Pacific stock markets and the United States, Burdekin and Siklos (2012) confirm the importance of crises in affecting the persistence of equity returns in the Asia-Pacific region and offer support for contagion effects. They argue that “post-Asian financial crisis quantile regressions yield substantial evidence of long-run linkages between the Shanghai market, the US market and many regional exchanges. Cointegration is particularly prevalent at the higher end of the distribution.” The increasing financial integration accompanying the integration of goods markets is particularly discernible in the trajectory of China’s financial capital. They conclude that “the enormous growth of the Shanghai market in the new millennium has been accompanied by a meaningful level of integration with other regional and world markets in spite of ongoing capital controls.”

The complex, intertwined production networks and supply chains, born of multidirectional offshoring in the Asia-Pacific region is brought home by Fujita and Hamaguchi (2012), Tomiura, Ito and Wakasugi (2013) and Das and Han (2013). Indeed, the latter focus on the trade in intermediate inputs between Korea and China, and on the potential of a “tripartite regional production network” involving Japan as well. They also note that this set of relationships is illustrative of a broader set of global value chain production networks that involve many other East Asian countries. Fujita and Hamaguchi note the significant increase in economic integration in East Asia, primarily through the rapid growth of trade in intermediate goods, components and parts. Indeed, China accounted for 30% of intraregional intermediate goods traded in 2007-2009. As noted by Fujita and Hamaguchi, China now accounts for 40% of the region’s GDP and 35% of its exports.

There is also an increasing body of work, both about the rising “tradability” of the ultimate non-tradable asset – real estate, through its complex linkages with the financial world, and the co-movement of real estate and real estate securities in Asia. Lin and Lin (2011) study growth patterns in asset prices in East Asia by analyzing the integration relationship between stock markets and real estate markets in each of six markets in the region. Results for six economies: China, Hong Kong, Japan, Singapore, South Korea, and Taiwan, show that “stock markets are integrated with real estate markets in Japan, and partially integrated with real estate markets in China, Hong Kong, and Taiwan. ... Examining the timing of market changes, we found the real estate market leading the stock market in some countries, and the stock market leading the real estate market in others.” (p. 571)

In the context of the interdependence, spillovers and contagion effects between markets in different countries, it is also important to know the transmission from real estate securities to stocks and vice-versa within countries. The interdependence between publicly traded real estate securities and stocks in Australia, China, Hong Kong, Japan, Malaysia, the Philippines, Singapore and Taiwan between January 1995 and March 2011, is the object of study of Liow and Lee (2013). Their results indicate that “Singapore, the Philippines and Hong Kong have the highest extreme real estate-stock market co-

movement of at least 50%. In addition, during the global financial crisis (GFC) period, the securitized real estate and common stock markets in China, Hong Kong, Japan, the Philippines and Singapore displayed the highest extreme dependence to react together to financial turmoil. The results in this paper also show that the extreme dependence patterns of real estate-stock markets are similar for many of the Asia-Pacific economies.”

Liow and Ye (2013) analyze the correlation and integration of capital markets (including real estate securities) and the overall state of economic globalization among Greater China economies, together with other Asia-Pacific partners, using primarily one-month interbank rates, exchanges rates, and inflation rates. The authors also assess whether the integration parameters have increased over time, and they conclude that the “increased realized cross-real estate securities market correlations and realized cross-stock market correlations imply that international capital markets have become increasingly integrated over the period 1996-2011.”

As in the case of the previous global financial crisis, the potential channels of contagion are many and varied. There are three broad categories, which can be the vehicles of transmission – “real” economic linkages (trade and investment), financial flows (portfolio investments, banking flows), and psychological factors. Cross-border investments and trade flows can be affected even due to purely domestic shocks, and thus impact other countries. Some financial variables have a contagion aspect partly because of the fact that macro-economic policies are sometimes coordinated, and because sometimes there is mimicry in policymaking or even beggar-thy-neighbor policies, where competition across countries leads to less than optimal outcomes for each. Thus, you can find a high degree of correlation across policy parameters, such as in short term interest rates. The possibility of socio-psychological factors should also be taken into account. Region-wide sentiments, confidence and animal spirits are critical in forming future economic expectations and may have a role to play in a regionwide contagion effect.

The degree of exposure to contagion will vary by the type and strength of the linkages between China and other countries. Table 2 provides examples of potential linkage and contagion relationships. For example, real linkages exist between individual Chinese investors and the Hong Kong housing market (C-3). As one expert commented, investment in Hong Kong housing by even the top 1% of the top 1% can have a substantial effect on Hong Kong’s (private) housing market (H-3). At the same time, there is a buffer to the contagion effect in the role of social housing, which accounts for 50% of the housing stock in the city-state (H-4). Nevertheless, housing is a significant part of Hong Kong’s GDP, and a shift in Chinese buying patterns could have ripple effects within the city-state’s housing market and economy (H-1). Singapore’s housing market is similarly affected by Chinese investment (S-1), but is even more broadly cushioned by the role of the public sector in the housing market (S-7). Both places have tried to mitigate impacts by taxation, fees and limits on who may invest in housing (H-2, S-3). Singapore’s housing market is further complicated by substantial flows of housing investment from other Asian countries, including Indonesia, Malaysia and India (S-1).

Contagion Category	Contagion Path	Direction of Flow	Vulnerable Countries
Real	Cross-border investment by individuals	China high wealth and middle income families to outside markets	Hong Kong Singapore (Western Countries, Japan)
Real	Cross-border investment by developers	Outside developers to China	(Western Countries, Japan)
Real	Raw materials	Resource rich countries to China	Australia, Canada

Contagion Category	Contagion Path	Direction of Flow	Vulnerable Countries
Real	Manufactured factor inputs and final goods	Outside to China	Korea, Japan, Taiwan, US
Financial Flows	Banking flows	Either	(flows too small to have significant effect)
Financial Flows	Portfolio investments	Outside to China	China
Financial Flows	Reserve investments	China to outside	US (but could also boomerang on China)
Psychological factors	Regionwide sentiments	China to outside	Other east Asian countries
Psychological factors	International confidence	Both	Global

Investment in real property is not limited to individuals alone. There are two-way flows in development activity. Several major Hong Kong and Singapore developers have become engaged in cross border residential development (and nonresidential as well) in China. There is also interest by Chinese developers in projects outside of China (S-7). As mentioned earlier, it is the individual developer at risk, rather than a systemic problem since the Chinese housing market does not have much leverage (S-8).

Singapore and Hong Kong feel the effects of consumer spending from China as well. Direct linkage of these economies to spending by Chinese citizens makes them vulnerable to a possible downturn (H-2, S-4). Yet these countries are also diversified in their international base of spending. For example, one government agency reported to us that China accounts for only 6% of Singapore trade (12% if Hong Kong is included) (S-5).

Other types of real flows to China could also face risks. A slowdown in China's production could reduce the demand for raw materials, imported inputs, and even final products. Countries far more distant than the Asia-Pacific may be the most vulnerable to this type of contagion (S-8). For example, Australia's close integration between its resource sectors and Chinese construction activity kept the economy on a stable growth path during the global financial crisis (Tirtiroglu 2012) but leaves the country more exposed to a downturn in China (C-5). Korea and Japan also have close ties in trade flows with China, mostly for intermediate goods destined for final export products.

Financial flows between China and other countries are still quite limited (C-3). Banking regulations have restricted foreign investment in Chinese banks, while in aggregate, foreign portfolio investment in China is a small part of diversified global investment. Some contagion could occur through affecting Chinese investments in foreign securities, and even in foreign government securities. As a large holder of reserves in foreign instruments, any major move of funds away from those products could have significant impacts. Such actions are likely to be tempered by the vulnerability of Chinese investments themselves to such a move.

Psychological impacts seem more likely to affect China's near neighbors than more distant trading partners. Free flow of funds from China to housing, tourism, and other purchases in neighboring countries (even as far as Japan, S-2) may well be an aspect of consumer confidence in those countries. Belt tightening in China could cause weaker sales and mutually eroding confidence in these markets.

Finally, there are other linkage factors related to demographics rather than either real estate or the economy. The aging population in China could lead to dramatic shifts in production costs relative to other countries as the size of the labor force begins to decline, through the absence of a large age cohort to

replace those aging out (S-6). The aging population will also put new demands for services on government and change the nature of demand for housing, services, and other products. One respondent commented “the country cannot get rich enough before it gets old,” (J-5) meaning that in contrast to Japan’s situation, the aging population in China is not backed by decades of strong growth and wealth accumulation to provide resources to care for the population in retirement years.

To explore the strength of linkages between Chinese economic factors and other Asia Pacific economies, as well as the United States, we look at correlations across countries for the following variables - gross domestic product growth rates, house prices, the current account balance, exports, inputs, inward direct investment, exchange rates, money supply, three month interest rates, as well as real estate stock co-movements across East Asia.

Figure 10 shows correlations in GDP growth rates and in housing price growth rates among China, Hong Kong, Japan, the Republic of Korea, Singapore, and the United States, annually between 2005 and 2011. China’s GDP movement correlates with the comparative countries with a range of 0.5 to 0.62, indicating a moderate positive co-movement of these factors among the different countries.

Figure 10

### GDP and Housing Price Change Growth Rate Correlation Compared, 2005 to 2011 Period

	GDP Growth					Housing Price Change				
	China	Hong Kong	Japan	Korea	Singapore	China	Hong Kong	Japan	Korea (Rep)	Singapore
China	1.00					1.00				
Hong Kong	0.62	1.00				0.54	1.00			
Japan	0.56	0.92	1.00			0.38	0.26	1.00		
Korea (Rep)	0.60	0.92	0.98	1.00		-0.13	0.01	0.25	1.00	
Singapore	0.50	0.84	0.96	0.97	1.00	0.34	0.46	0.56	0.31	1.00
US	0.51	0.99	0.92	0.92	0.85	-0.06	-0.05	0.29	0.17	0.03

Source: Bardhan, Edelstein, Kroll from World Bank data and Global Property Guide.  
 Note: GDP is annual data, housing price change is quarterly data.

There is also a clear trend of increasing correlation of GDP growth over time, as shown in Figure 11. Prior to the Asian crisis, China’s GDP growth showed much weaker (and at times negative) correlation with its neighbors. The country’s strongest relationship was with US GDP growth. Since the Asian crisis, the correlation of China’s GDP growth with its neighbors has gradually strengthened (with the strongest relationship in most recent years shown in the earlier table).

Figure 11

## GDP Growth Rate Correlation Pre- and Post-Asian Crisis

	1980 to 1997					1998 to 2011				
	China	Hong Kong	Japan	Korea	Singapore	China	Hong Kong	Japan	Korea	Singapore
China	1.00					1.00				
Hong Kong	0.28	1.00				0.55	1.00			
Japan	-0.34	-0.04	1.00			0.42	0.78	1.00		
Korea (Rep)	-0.13	0.55	0.40	1.00		0.14	0.70	0.55	1.00	
Singapore	-0.10	0.20	-0.13	0.02	1.00	0.50	0.87	0.83	0.65	1.00
US	0.44	0.22	0.10	-0.24	0.03	-0.09	0.33	0.63	0.24	0.45

Source: Bardhan, Edelstein, Kroll from World Bank data.

Housing price change shows much less correlation than does GDP growth. Among all of the markets shown in Figure 10, Singapore has the closest correlation with other Asian markets, (but virtually none with the US). China house price change correlation is, not surprisingly, highest with Hong Kong, at 0.54, while it also shows some correlation with Japan (0.38) and Singapore (0.34). US markets overall show very little correlation with Asian markets, with the highest correlations coinciding with countries at similar levels of development--Japan at 0.29 and Korea next at 0.17.

Correlations of China's Trade indicators with those of neighboring countries are shown in Figure 12. These indicators can be interpreted either as the other countries' degree of integration with China in the production process, as opposed to trade in goods destined for final products sold to China's domestic market, or as a broader integration in markets across those countries. The strongest correlations, across the board, are in imports. With the exception of Singapore, export correlations are also quite high between China and most of the other East Asian countries. As might be expected, there is little correlation between Chinese financial indicators and those of other countries (Figure 13). This suggests that the country's insular financial system may prevent somewhat the type of cross-country contagion experienced in the US case. However, this interpretation should be considered with the caveat that the financial indicators in no way track the size or scope of the shadow banking system in China.

Figure 12

### Correlations of Trade Indicators—China and Its Neighbors

	Current Account Balance	Exports	Imports	Inward Direct Investment	Exchange Rate
China	1	1	1	1	1
Hong Kong	0.50	0.62	0.67	-0.14	-0.04
Japan	0.42	0.40	0.46	0.34	-0.00
Korea (Rep)	-0.44	0.49	0.62	-0.21	-0.08
Singapore	0.01	0.01	0.56	-0.49	0.13
Taiwan	-0.22	0.54	0.53	-0.12	0.07

Source: FCREUE from CEIC Global.

Figure 13

### Correlations of Financial Indicators—China and Its Neighbors

	M2	3-month Interbank Offer Rate
China	1.00	1.00
Hong Kong	-0.06	0.28
Japan	-0.06	0.18
Korea (Rep)	0.03	0.47
Singapore	0.12	0.17
Taiwan	0.19	0.56

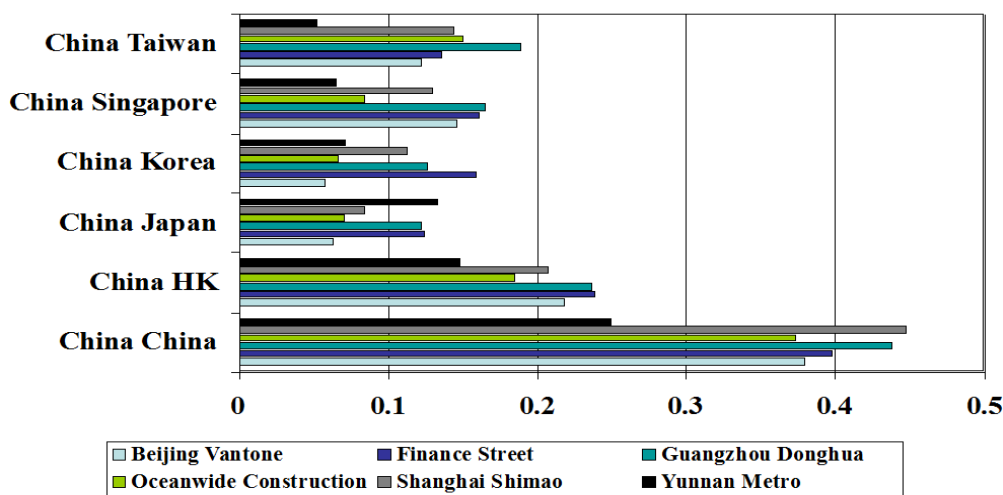
Source: FCREUE from CEIC Global and International Monetary Fund.



Within China, real estate stock movements are somewhat correlated with other non-real estate stocks, although at only the 0.35 to 0.45 level, as shown in Figure 14. There is much less correlation between Chinese real estate stocks and stocks in other East Asian countries.

Figure 14

## China Real Estate Stock Movement Correlation with Rest of Chinese Stocks and Stocks in East Asia



Source: FCREUE from [to be added]

Overall, as expected, the greatest level of economic and financial integration is within the greater China region, which includes mainland China, Hong Kong and Taiwan. China also appears to have a fair degree of correlation with Japan, except in pure financial variables, such as money supply and interest rate. However, to give some comparative perspective, Germany, which is the largest economy in Europe, is far more closely integrated in both economic and financial variables with its neighboring countries in Western Europe. Indeed, this was true even before the whole momentum toward a common market developed. From that perspective, while China, being the largest economy in Asia, and the catalyst of the region's growth is still not all that closely integrated, primarily in the financial-currency sphere.

### Section 7: The Bottom-Line - A Mixed picture

China's housing markets can be summarized as follows:

- a) On the demand side there are severe pressures, emanating from strong urban growth, high savings and demographics, backlog of quality housing and double digit real growth in urban wages.
- b) The supply side is robust, fed by local financing imperatives, and hostage to national and local economic-strategic objectives.
- c) The role of the government in housing is still extensive. The housing finance system is state-dominant and has been somewhat effective in controlling the market, although the success is largely in direction rather than in level of change.

- d) Housing and real estate are among the largest sectors in the economy.
- e) There is widespread speculative mania, in addition to genuine household demand, fed also by the lack of investment alternatives.

In order to answer the broad questions posed in the beginning of this paper, we have to examine three interrelated issues: a) Is there a bubble in China's housing market, or, more reasonably, what are the chances of a major correction due to persistent inflated values? b) How strongly will that impact China's overall economy? c) How effectively will the shock transmit to other countries?

To summarize our arguments in the preceding pages, the following attributes of the housing market argue in favor of the bubble hypothesis:

- 1) Very high, unprecedented, and in many cases unique Price-Income and Price Rent Ratios
- 2) Large numbers of vacant apartments and office buildings; empty malls
- 3) As mentioned earlier, the widespread evidence of speculative purchases by businesses, investors, and other non-household actors
- 4) Incentives for local governments to prime the housing pump
- 5) The prevalent macro-policies and growth strategy with its focus on investment that creates a similar set of incentives for keeping the boom going.

On the other hand, there are a whole range of fundamentals and underlying economic factors that seem to suggest that the valuations are defensible in the context of the larger economic picture that China presents, or at least that there may be sufficient countervailing forces to cushion a decline in value:

- 1) Significant and robust urban population growth (C-2) together with double digit income growth in urban areas (C-8, C-10)
- 2) Pent up demand due to backlog of housing, new financing options
- 3) Urban population growth exceeds building activity; over the decade from 2001 to 2011 80 million new urban households have been formed, but only 62.6 new housing units were completed and 76.5 units were sold (See NBS and CB Richard Ellis 2012)
- 4) Few options for savings; socio-cultural factors and homeownership bias imply a higher price-income ratio in equilibrium

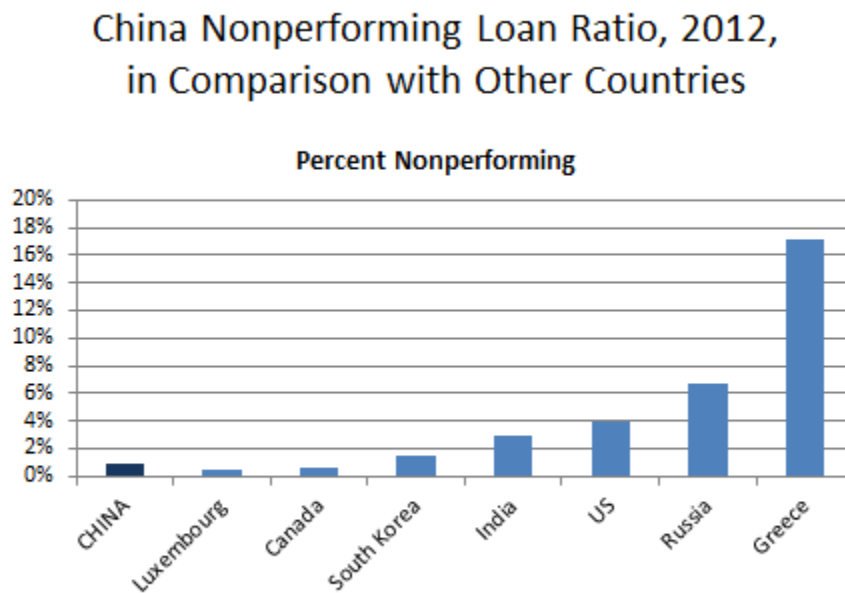
The real estate and housing sector is disproportionately large and any shock will necessarily have a correspondingly large impact on the economy (C-5). However, some other factors need to be taken into account. First, mortgage and macro-prudential policies, such as loan-to-value ratios and debt-income ratios, banking and monetary measures, such as reserve requirements and credit targets, and local government regulatory guidelines for developers have been successful in boosting or dampening the market in the past, although their effectiveness is decreasing due to the increasing weight of the shadow banking sector. The low LTV ratios, the relative immunization of the finance system from housing because of low mortgage penetration and low levels of securitization suggest a contained impact from housing. However, private investors, shadow banking structures, off-balance sheet investment vehicles are vulnerable, if not the state-owned banks per se, although the latter are also enmeshed in construction loans and other real estate activity through the local government finance channels. A serious downturn in construction will inevitably affect downstream and upstream sectors, such as cement, steel and appliances to a significant degree. Overall, there is no doubt that a housing crash, if it happens, will have major repercussions, but primarily through the real economy channels. The finance sector will also be adversely affected but the extent and severity will be determined by other factors mentioned below.

China's strong Asia-Pacific region-wide linkages would imply the shock can propagate far and wide, but primarily through non-financial channels. The direct impact would include negative consequences for Asia-Pacific based input and final goods suppliers, such as Korea and Taiwan, for China's construction, housing, and appliances industry. Second order effects can also be significant because of extensive trade and investment linkages throughout the region.

There are a number of wild cards, which can interact with the scenarios mentioned above and considerably intensify the adverse consequences. They pertain mostly to the monetary and financial structures, and while they are intricately connected to the real estate and housing world, their vulnerability exists even over and beyond the housing situation. Debt in China is increasing at an alarming pace, especially that of local governments. The National Audit Office announced that the debts of China's local governments had increased to RMB 17.9 trillion (\$3.0 trillion) by the end of June 2013. This is a 70 percent increase from the RMB 10.7 trillion (\$1.8 trillion) owed by the country's local governments at the end of 2010.

According to the Chinese Academy of Social Sciences (CASS), China's total debt was RMB 111.6 trillion (\$18.3 trillion) at the end of 2012, which was 215.7 percent of that year's GDP. Of this amount, corporate debt equaled 113.5 percent of GDP; government debt, 53.5 percent; household debt, 31.1 percent; and financial sector debt, 17.6 percent. Apart from the high levels of debt it is the increasingly weak quality in terms of repayability of the debt that is a matter of concern. While the non-performing loan ratios are reasonable by international standards, as shown in Figure 15, their total volume is rising. Koons 2013 shows data indicating nonperforming loans in China's banking system reaching \$540 billion yuan in the first half of 2013, up from less than \$500 billion for the whole of 2012. The shadow banking sector, primarily its wealth management arm for high net worth individuals is showing explosive growth, and total wealth management products, trusts and special purpose investment vehicles now constitute over 25% of GDP.

Figure 15

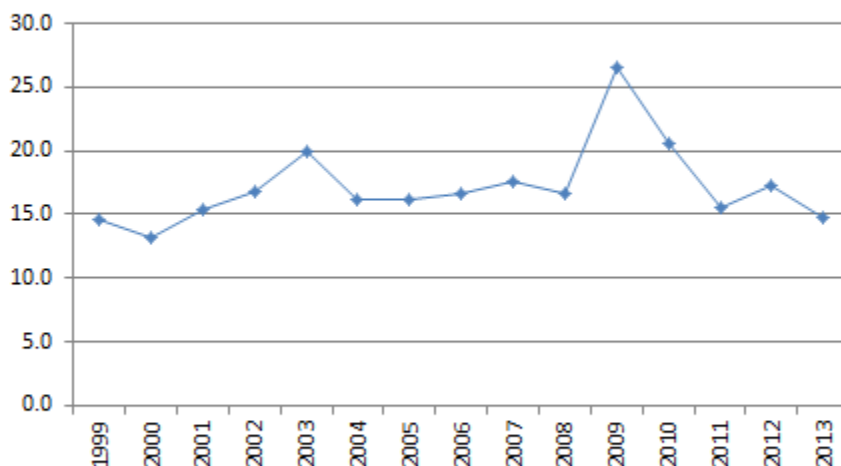


Source: World Bank data as reported in Koons 2013.

Another key underlying vulnerability in the financial system, connected to the debt issue mentioned above, has been money creation to an astonishing degree. China had less than half the total US banking deposits in 2005, but the money supply has skyrocketed since then at double digit annual rates, frequently exceeding 20%, as shown in Figure 16. Since 2005 alone bank deposits have nearly quadrupled, increasing by \$11 trillion, or over 130% of GDP. The only way this has not spurred retail inflation is because large amounts have gone into speculative asset purchases, especially housing.

Figure 16

## Growth of China's M3 Money Supply 1999-2013



Source: OECD, Main Economic Indicators complete database, <http://dx.doi.org/10.1787/data-00052-en>, as shown on Federal Reserve Bank of St. Louis FRED Web Site.

A number of other issues are of relevance going forward. For various structural reasons, such as increasing dependence on global energy and food supplies, it is likely that China's linkages with the rest of the world may increase. Future contagion possibilities, therefore, are very much on the cards. The role of demographic changes, the ageing of the population and the future impact of a somewhat looser one-child policy will affect housing in the long run, albeit slowly and gradually. Also, since many investors from China have recently been embarking upon a significant amount of investments in US and European real estate, especially in housing, the potential contagion effects from China to the West and vice versa may get enhanced. A recurring matter of concern will be the task of demystification and deconstructing the actual debt numbers for China. The pervasive role of the state at local, central and state-enterprise levels in matters relating to debt, as well as the activity of state-controlled banks in creating it complicates analysis. Perhaps, national debt in China is subtly larger than it appears because the federal government, if push were to come to shove, would be responsible for much of the debts being issued by State Owned Enterprises in addition to debts being created by local governments.

Our conclusion is that the potential, as well as channels for contagion exist, and China is a large enough economy that a downturn could make ripples—or waves—globally. However, the real estate sector itself is more likely to lead to a more contained set of problems concentrated in China and its major trading partners. Broader contagion, should it occur, would come from a combination of factors, amplified by multiple adverse conditions in the financial sector. Even so, while there is growing leverage within China,

there is much less leverage associated with China among foreign investors, limiting the possible scope of contagion beyond the Asia Pacific.

Factor	Housing Bubble and Financial Crisis	Chinese and Asian Housing Markets, 2007-2014
Housing Demand	<ul style="list-style-type: none"> <li>• Pent-up demand-- lower income borrowers;</li> <li>• Move-up of previously credit restricted borrowers</li> <li>• Investors anticipating quick appreciation</li> </ul>	<ul style="list-style-type: none"> <li>• Rural to urban migrants</li> <li>• One-child family affects initial and future generations</li> <li>• Investment vehicle <ul style="list-style-type: none"> <li>○ Within China</li> <li>○ Across borders</li> </ul> </li> </ul>
Housing Supply	<ul style="list-style-type: none"> <li>• US, UK, Ireland: Developers responding to expanded pace of growth</li> <li>• Spain: Investment in second homes</li> </ul>	<ul style="list-style-type: none"> <li>• Local government land sales</li> <li>• Government deep pocket developers</li> <li>• Asian developers investing in Chinese multifamily real estate</li> </ul>
Finance	<ul style="list-style-type: none"> <li>• New entrants to mortgage lending</li> <li>• Existing lender adjustment of product and standards</li> <li>• New participants, vehicles in secondary market</li> <li>• Europe: Cross country loans; cross country investment in secondary products</li> </ul>	<ul style="list-style-type: none"> <li>• Role of multigenerational or multifamily savings</li> <li>• Expanding mortgage banking</li> <li>• Introduction of provident funds tied to housing investment</li> </ul>
Government Regulation	<ul style="list-style-type: none"> <li>• More mortgage entities outside of banking regulation</li> <li>• Guarantees expanded to new products</li> <li>• Lax oversight by rating agencies</li> <li>• Deregulation during previous decade</li> </ul>	<ul style="list-style-type: none"> <li>• LTV used as policy vehicle to heat or cool market</li> <li>• Number of loans regulated</li> <li>• Regulations in neighboring countries regarding outside investment in housing</li> </ul>
Broader economic linkages	<ul style="list-style-type: none"> <li>• Direct employment and income and employment multiplier effects of construction</li> <li>• Real estate wealth effects</li> <li>• Commercial loans</li> <li>• Global financing of financial institutions and other businesses</li> </ul>	<ul style="list-style-type: none"> <li>• Direct employment and income and employment multiplier effects of construction</li> <li>• Real estate wealth effects</li> <li>• Commercial loans</li> </ul>

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Interview Types, Locations and Time Frame				
Interview citation code	Organization type	Location	Number Included	Date
C-1	Local Government Financial Program	China	6	October 2012
C-2	Government Research Institution	China	4	October 2012
C-3	International Commercial Brokerage Firm	China	1	October 2012
C-4	Journalist and Academic	China	1	October 2012
C-5	University Professor	China	1	October 2012
C-6	University Academics	China	3	October 2012
C-7	Investment Banker	China	1	October 2012
C-8	US Government Representatives	China	3	October 2012
C-9	Private Developer	China	2	October 2012
C-10	US Research Institute	China	3	October 2012
H-1	International Commercial Brokerage Firm	Hong Kong	2	November 2012
H-2	International Commercial Brokerage Firm	Hong Kong	2	November 2012
H-3	Private Developer	Hong Kong	2	November 2012
H-4	Government Agency	Hong Kong	2	November 2012
H-5	Commercial Leasing Business	Hong Kong	2	November 2012
H-6	University Academic and Government Official	Hong Kong	1	November 2012
J-1	Research Institute	Japan	2	May 2013
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K-1	Academic	Korea	1	December 2012
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S-1	Financial Journal	Singapore	1	May 2013
S-2	International Commercial Brokerage Firm	Singapore	1	May 2013
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S-5	Government Institution	Singapore	1	May 2013
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