

Real Estate Watch

China

BBVA Economic Research Department

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China's residential property market has a bright long-term investment potential. However, near-term adjustments are unavoidable because of short-term excess supply and the sharp global recession. We estimate that downward price adjustments in residential property prices of up to 20% in some first-tier cities are possible in the near term.

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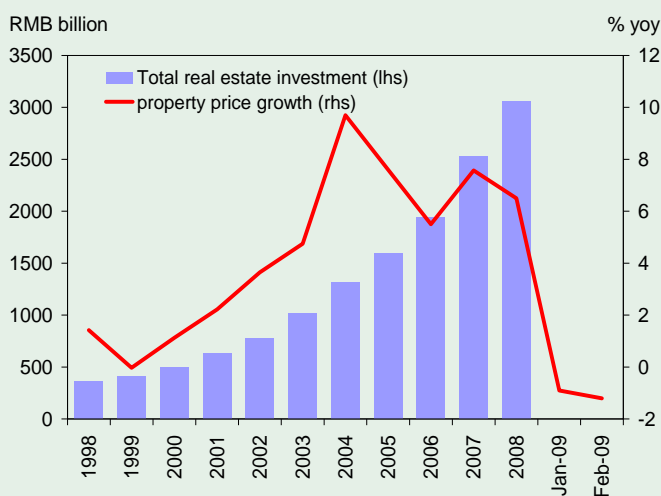
Executive Summary

- China's residential property market has a bright long-term investment potential, supported by fast income growth, rapid urbanization and a rapid depreciation of housing stocks.
- However, near-term adjustments are unavoidable given the sharp economic downturn and current oversupply in the high-end residential housing. Although the situation varies widely across provinces and cities, downward adjustments in prices of up to 20% in first-tier cities are possible in the near term.
- Our housing valuation measures, estimated based on the supply and demand conditions of major Chinese cities, suggest that the housing prices in Beijing, Shanghai, and Shenzhen are currently overvalued by about 16%, 18%, and 20% from their respective equilibrium prices. However, the current resident housing prices in the Guangzhou appear to be reasonably priced, when compared with our equilibrium price measure. We also observe some overvaluation in some second-tier cities such as Chongqing and Tianjin in the order of 20% to 25%.
- While we do see some further downward adjustments in residential housing prices, we view the probability that China's property market will experience a further sharp fall in prices as very low. This is because China's urban demand for housing will remain resilient given its high savings ratio, good growth prospects, low interest rate environment, and proactive government policies. As long as housing prices are flexible enough and can adjust according to economic conditions, demand is likely to react accordingly. Indeed, the recent rebound in transaction volumes nationwide after some declines in prices illustrates this point.
- Given the residential housing market has been an important source of local government tax revenue, careful formulation of government policies is needed in order to alleviate the impact of the near-term adjustment in the residential property market. Here are some of our proposals:
 - Local policy initiatives to reform the resident registration system to expand permanent urban population in their locales will help stimulate demand for housing, thus potentially easing the fall in residential property prices.
 - Constructing more and providing affordable rental housing by local governments for low income families and migrants could stimulate the real estate sector investment and therefore the local economy. However, more government-provided low-price housing for low-income and middle-income population without stringent income test may create the wrong incentives and potentially drive down property prices further, leading to negative equity to the existing homeowners.
 - Accelerated urban renewal programs will help create demand through fast depreciation of old housing stocks whose quality is already in need of upgrade.
 - Continued adoption of new mortgage finance instrument such as covered bonds will make housing finance less expensive and help reduce risk concentration in commercial banks. In addition, new financing instruments such as REITs could also be a useful means for real estate developers to widen their fund raising channel, reduce leverage, and share risks among a broad spectrum of investors.

1. Introduction and Overview

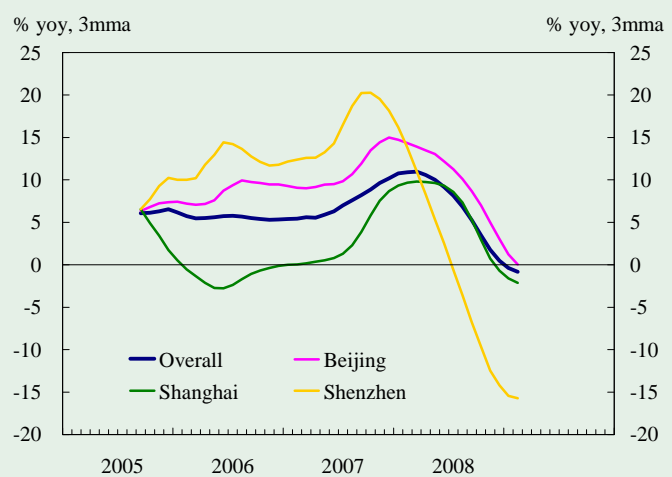
After a period of surges in residential housing prices, China's real estate market started to cool in the middle of 2008, largely because of the tight monetary policy and other administrative measures that were implemented at the end of 2007 in an attempt to rein in real estate investment and rapid rise in housing prices. Indeed, the ensuing global financial crisis after the collapse of Lehman Brothers in September 2008 has quickly changed the outlook on residential housing in China. The nationwide housing price has experienced a decline for the time in a decade from December 2008 onwards (Chart 1). In some large cities, the fall in prices has been substantial. For example, Shenzhen, a city that has a high reliance on exports, has seen its monthly housing prices drop by over 15% in recent months (Chart 2). Though still moderate, Beijing and Shanghai have also started to experience falls in their housing prices.

Chart 1: Real estate investment and prices



Sources: CEIC and BBVA estimates.

Chart 2: Property prices nationwide and in key cities



Sources: CEIC and BBVA estimates.

While there is little doubt that China's residential property market has a bright long-term investment potential supported by long-term growth prospects, rapid urbanization, and high urban population densities, how will China's residential property market fare in the current global financial crisis? Specifically, will the residential property market experience a hard landing? How much more downward adjustment is expected? Are there any differences in terms of the adjustments among key cities in China such as Beijing, Shanghai, Shenzhen, and Guangzhou?

This first BBVA China Real Estate Watch intends to answer these questions in a comprehensive way. While we do see some further downward adjustments in residential housing prices, we view the probability that China's property market will experience a hard landing as very low. This is because China's urban demand for housing remains resilient given China's high savings ratio, good growth prospects because of the fiscal stimulus package, low interest rate environment, and proactive central and local government policies to stimulate the real estate sector. As long as housing prices are flexible enough and can adjust according to economic conditions, we believe demand will likely react quickly. Indeed, the recent rebound in transaction volumes nationwide after falls in prices illustrates this point.

However, some further near-term adjustments in an economic downturn are unavoidable, as the short-term structural oversupply exists in the high-end residential housing and the economy is expected to grow at or even below its medium-term potential. Therefore, further downward adjustments in price of up to 20% in some first tier cities are possible in near term.

Our housing valuation measures, estimated based on the supply and demand conditions of individual cities, suggest that the current housing prices in Beijing, Shanghai, and Shenzhen are overvalued by about 16%, 18%, and 20% from their respective equilibrium values. However, the current resident housing price in Guangzhou appears to be reasonably priced according to our valuation measure. We also observe some price overvaluation in some second-tier cities such as Chongqing and Tianjin in the order of 20% to 25%, respectively, according to our equilibrium valuation measures.

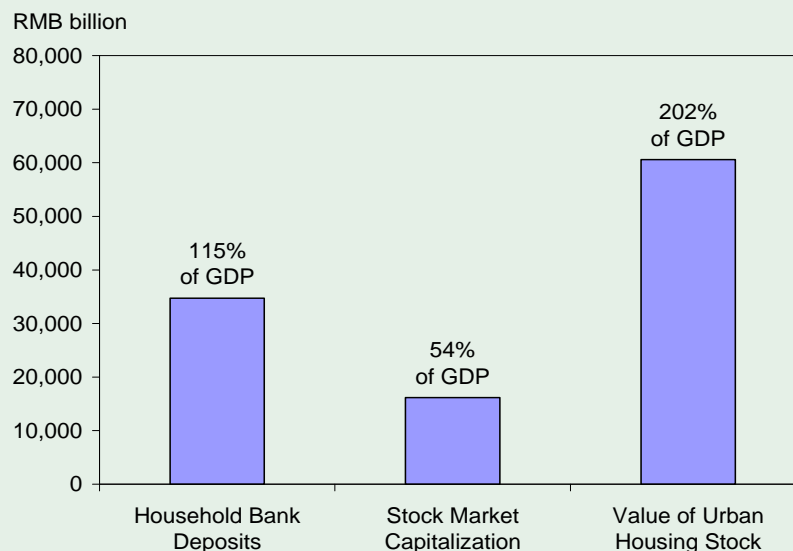
The rest of the report proceeds as follows: Section 2 provides an overview of China's real estate market. Section 3 uses a supply and demand framework to estimate whether there is over- or under-valuation in some key Chinese cities using a newly constructed quarterly database. Section 4 looks at the impact of real estate cycles on macroeconomic activities from international experiences and draws some policy lessons for China.

2. China's Residential Property Market: Latest Developments and Some Characteristics

Although China has allowed private housing ownership since the early 1980s soon after the 1978 economic opening and reform, wide-spread private housing ownership did not take place until 1998 when the State Council decided to completely phase out the old housing distribution system after experiments already having taken place in some coastal cities and provinces. Privately-owned residential housing thus has a short history in the post reform China.

Despite a slow start, this market has developed quickly over the last decade and it has since become an important asset class for portfolio allocation of Chinese residents. We estimate that the nationwide urban real estate assets are at around RMB 60 trillion, already far exceeding either the size of China's banking deposits or the stock markets (Chart 3). Therefore, the health of the housing sector is to have an important impact on the real activity as well as the health of China's banking system.

Chart 3: Value of Assets



Sources: CEIC and BBVA estimates.

Nationwide property market cycles:

The first five years (1998-2003) since the private housing ownership became relevant saw only moderate increases in the nationwide property prices, consistent with a macroeconomic environment where inflation was low or even negative and the economy was still recovering from the impact of the Asian financial crisis.

China's housing prices did not really experience a large increase until 2003 when the economy experienced a short episode of economic overheating. The property prices then started to increase at an unprecedented pace (namely at an average of 7.4% per annum) till 2005. The macroeconomic tightening measures ensued seemed to have worked to dampen the rapid rise in housing prices.

However, the surges started again in 2007, possibly driven by rising capital inflows and faster appreciation of the RMB exchange rate. This cycle peaked in mid 2008. The nationwide real estate prices have since decelerated fast and started to decline since the end of 2008.

Property cycles in Key Cities:

Beijing: The residential property price did not take off until 2003. It had since risen at an averaged 7.6% until 2007. The property prices have started to cool down since the beginning of 2008, after a sharp 11% increase in 2007 (Chart 4a). The peak of Beijing's housing price is also coincided with the peak of its real estate investment cycle.

Shanghai: Its housing prices started to rise in 2001 and peaked in 2003 after registering a yoy growth of over 20%. Growth in the property prices on average soon dropped sharply and even declined by 2 to 3% in 2006. The price rebounded somewhat in 2007 and 2008 before declining again in early 2009 (Chart 4b).

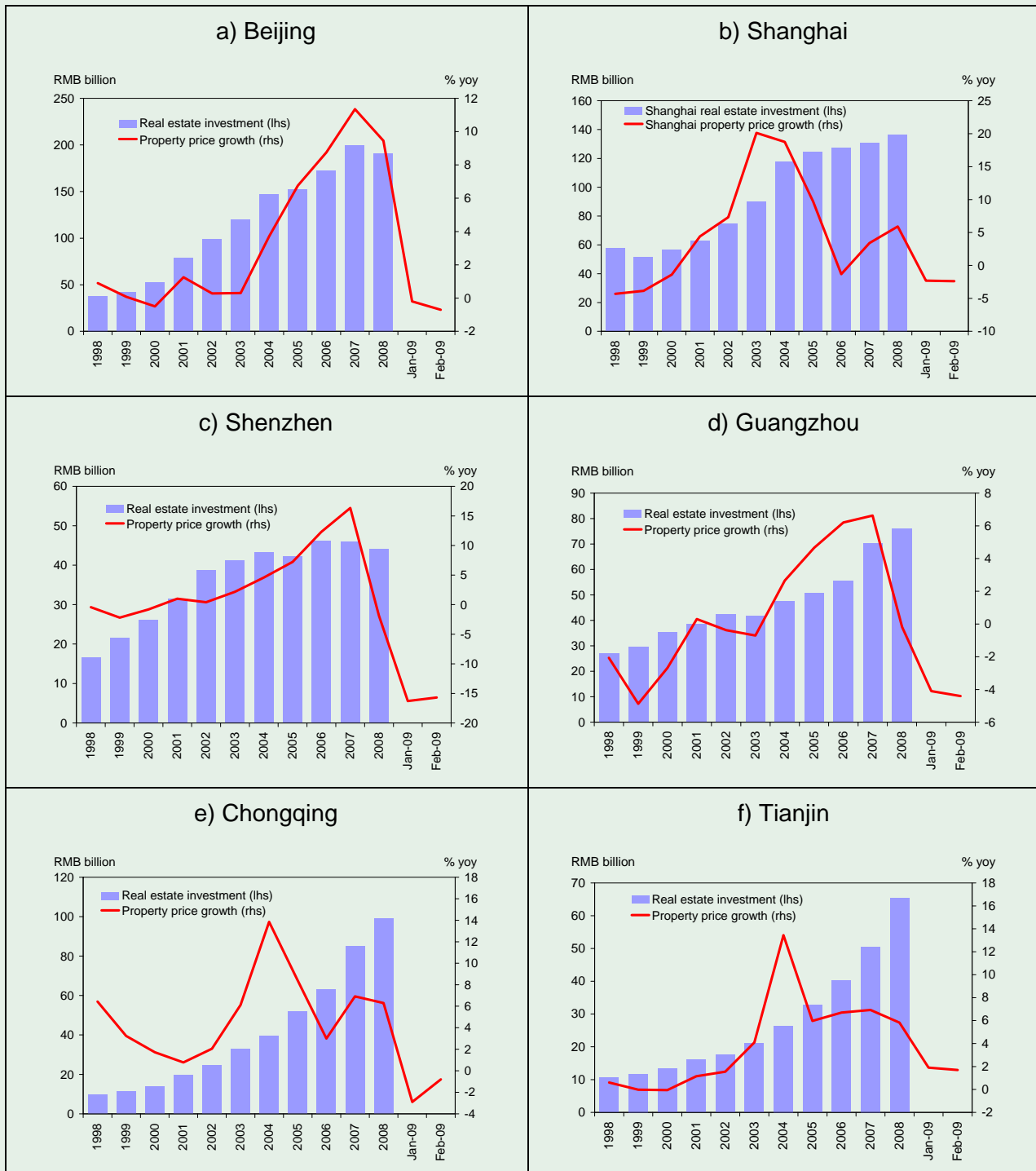
Shenzhen: Affected by the Asian financial crisis in 1997-98, Shenzhen's housing prices stagnated for the period of 1998 to 2002. After 2003, the housing prices rose sharply and peaked in 2006 and 2007 with a yoy growth at over 17%. The residential housing prices have since dropped sharply. The price falls in Shenzhen have been the largest so far among the key cities in China with a large negative yoy growth of 15.7% in February 2009 (Chart 4c).

Guangzhou: Affected seriously by the Asian financial crisis, Guangzhou's property prices fell over the period from 1998 to 2003. The decline in the residential property prices was the largest in 1999 with a negative 5%. The city saw a moderate recovery of housing prices between 2004 and 2007. However, the rebound over the period was not very large. For example, the largest increase was close to 7% in 2007. The prices then declined again in 2009 by as much as 5% in early 2009.

Tianjin: The housing prices in Tianjin stagnated for the period of 1998 to 2002. It took off sharply in 2003 and peaked in 2004 with a yoy growth rate of over 13% driven by central government intentions to enhance Tianjin's status as a high-tech and financial center for Northeast China. Rapid growth in housing prices halted in 2005 and it had since been maintained at a yoy rate of less than 6 until a large drop to a negative 2% in 2009. Despite price moderations, real estate investment continued to rise at a fast rate. Indeed, the supply factor especially after the set up of a new special economic zone in Tianjin in 2005 will continue to affect Tianjin's property prices.

Chongqing: It appears that Chongqing's residential housing prices had already experienced a cycle after its naming as the fourth Municipality--a status similar to a province--in China in 1997. This cycle bottomed in 2001; another cycle soon began and it was peaked in 2004 at a yoy growth rate of 14%. Although growth in property prices rebounded after 2006, it has dropped sharply after 2008 to an averaged negative 2% in early 2009. Chongqing is another city where real estate investment has seen rapid increase after 2005.

Chart 4: Citywide Real Estate Investment and Property Prices



Sources: CEIC and BBVA estimates.

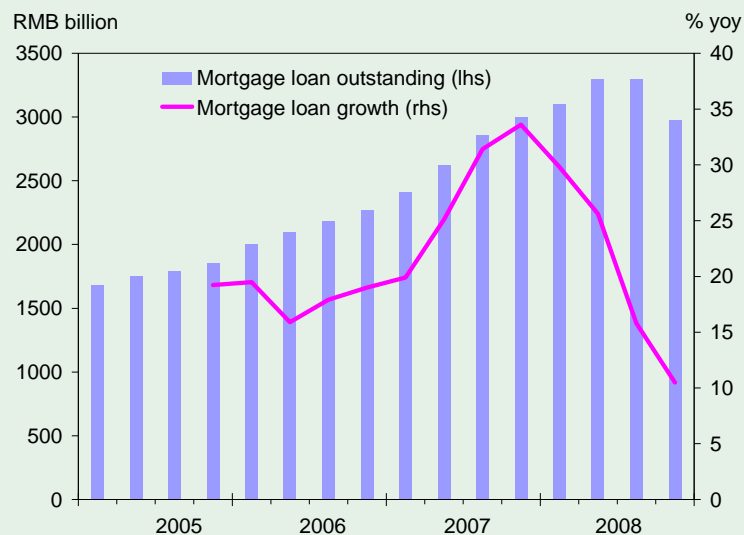
Mortgage finance and interest rates:

Mortgage finance also has a short history in China. It did not exist until 1999. China's mortgage outstanding, though growing fast, remains a small portion of bank loans at around 10% at the end of 2008 (Chart 5). For the time being, most mortgage loans are mostly on banks' balance sheet and there is little securitization of bank mortgages. Although the current mode of development appears to be adequate to meet demand for mortgage finances, it also runs the risk of potential maturity mismatch for the banking system, as the term structure of bank deposits is usually shorter than that of mortgage loans. In addition, the banking system bears the primary risk when housing markets

experience boom-bust cycles. Alternative mortgage finance methods such as covered bonds and mortgage backed securities should also be developed. The on-going global financial crisis that originated from the subprime mortgage crisis in the US shows the covered bonds approach may be more appropriate for China, largely because the structure of the covered bonds is simple and the identification of the ultimate risk bearer straightforward. The latest developments also show that the covered bonds do not seem to be highly sensitive to changes in the underlying asset price, in this case, the home prices (See Box 1 for a discussion on the merits of different forms of mortgage finance in developed economies).

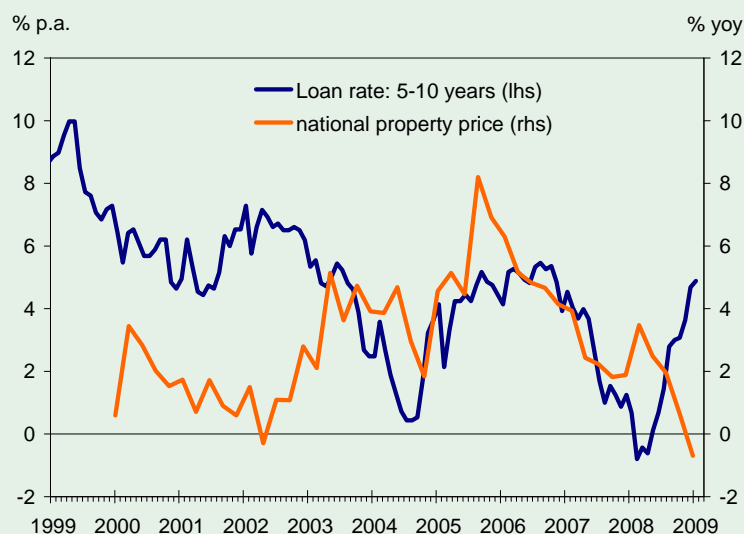
Real mortgage rates had a roughly negative relationship with real property prices until 2003. This relationship seemed to have changed for the period of 2004 to 2008, where there is a synchronized movement between real interest rate and property prices. This suggests that some other factors such as expectation of fast appreciation in residential properties and favorable credit conditions were also driving the rapid rise in housing prices during this period. The negative relationship returned after 2008.

Chart 5: Mortgage Loan Outstanding



Source: Wind.

Chart 6: Real Interest Rates and Property Prices



Sources: CEIC and BBVA estimates.

Affordability:

At the national level, China's growth in GDP per capita is twice as fast as that in property growth. Meanwhile, housing appears to be quite affordable by the price to disposable income ratio, even by international standards. However, in certain cities, this ratio has much exceeded some international recognized threshold, particularly in Beijing, Shanghai, Guangzhou, and Shenzhen. The affordability ratio could be improved slightly if we include contributions made by the Housing Provident Fund as discussed in Box 2. However, the ratio still would look unsustainable in these four cities.

Table 1: Affordability: Some comparison within China

	GDP per capita (% yoy) (2002-2007)	Property Price (% yoy) (2002-2007)	Property price to per capita income (%) ^{1/} (2007)
Nation-wide	14.0	6.5	7.6
Beijing*	12.9	5.8	14.2
Shanghai	12.8	9.1	9.6
Chongqing	15.4	6.7	5.8
Chengdu	12.7	5.4	7.8
Tianjin	15.8	6.4	4.0
Wuhan	13.5	4.9	8.8
Qingdao	18.0	9.6	7.9
Guangzhou	8.3	2.7	10.4
Shenzhen	15.2	5.9	11.3
Nanning	7.9	5.0	7.1

Sources: CEIC, Wind and BBVA estimates.

Notes: * GDP per capita growth for Beijing is simple average of 2002-2008.

^{1/} Floor space per capita is roughly 27 squared meters.

Rental Returns:

Rental returns in first tier cities are quite similar, especially for investments in small apartments. Compared internationally, China's gross rental returns are higher than those in Hong Kong, Singapore and Taiwan but much lower than those in some developing ASEAN economies.

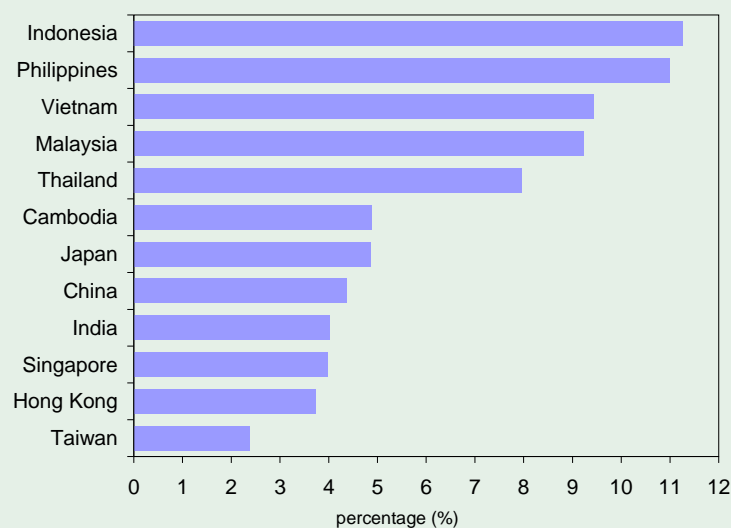
Table 2: Rental Returns in Some Key Cities

		Price (USD)		Yield (% p.a.)	Price per square meter (USD)	
		Total value	Monthly Rent		Value	Monthly Rent
Beijing ¹	<i>Apartments</i>					
	60 sq.m	114,180	539	5.67	1,903	8.98
	120 sq.m	261,960	1,122	5.14	2,183	9.35
	200 sq.m	465,800	2,206	5.68	2,329	11.03
Shanghai ²	<i>Apartments</i>					
	60 sq.m	116,040	533	5.51	1,934	8.88
	120 sq.m	323,640	1,176	4.36	2,697	9.80
	200 sq.m	600,200	2,468	4.93	3,001	12.34
Guangzhou ³	<i>Apartments</i>					
	60 sq.m	67,440	305	5.43	1,124	5.08
	120 sq.m	169,200	734	5.21	1,410	6.12
	180 sq.m	345,960	1,298	4.50	1,922	7.21
Shenzhen ⁴	<i>Apartments</i>					
	45 sq.m	66,150	314	5.70	1,470	6.98
	75 sq.m	106,500	406	4.57	1,420	5.41
	105 sq.m	123,165	457	4.45	1,173	4.35
	<i>Villas</i>					
	120 sq.m	244,920	992	4.86	2,041	8.27
	185 sq.m	573,315	1,650	3.45	3,099	8.92
	255 sq.m	1,367,310	2,978	2.61	5,362	11.68
	325 sq.m	2,017,925	3,926	2.33	6,209	12.08
	450 sq.m	3,460,500	6,336	2.20	7,690	14.08
Chengdu ⁵	<i>Apartments</i>					
	60 sq.m	57,000	203	4.28	950	3.38
	120 sq.m	110,760	395	4.28	923	3.29
	180 sq.m	173,160	682	4.73	962	3.79

Source: Global Property Guide

- Notes: 1. Districts included: Chaoyang; Dongcheng; CBD area
2. Districts included: Jingan; Xuhui; Changning; Pudong
3. Districts included: Haizhu; Huangpu; Tianhe; Zengcheng
4. Districts included: Nanshan; Futian
5. Districts included: Wuhou; Jinjiang; Jinniu; Qingyang
Data as of 19 Feb, 2009.

Chart 7: Gross Rental Yields

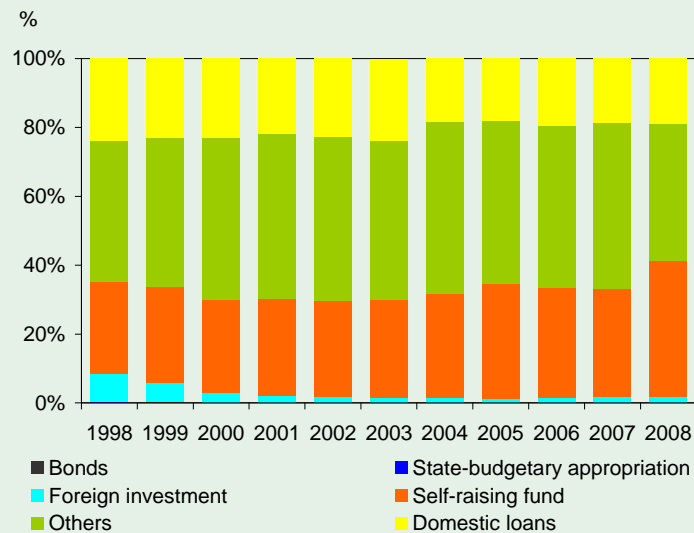


Source: Global Property Guide.

Funding Sources of Real Estate Projects:

Real estate projects are mostly funded by self-raised funds and bank loans, whereas non identified sources are also large. In this category, it could be from public listing of real estate firms or private equity participation in housing development projects. Foreign participation used to occupy over 5% of the funding sources in 1998 and it has since declined to less than 2%. Bond financing is almost non-existent, so are REITs.

Chart 8: Financing Sources for Real Estate Development



Sources: Wind and BBVA estimates.

Box 1: Covered Bonds vs. Mortgage Backed Securities: Experiences from Europe and the US*

There are basically three funding methods available to finance residential mortgages. The simplest method is for banks to fund mortgage loans utilizing their retail deposits. While it is a straightforward way to start the mortgage financing business for banks, this method also runs the risk of maturity mismatch, as the term structure of bank deposits is usually shorter than that of mortgage loans. In addition, the banking system bears the primary risk when housing markets experience boom-bust cycles. At this juncture, the Chinese residential mortgages are primarily financed via this method.

The second method to finance mortgages is through covered bonds or mortgage bonds issued by a bank itself and guaranteed by its mortgage portfolio. The third method of mortgage finance is through securitization. In this case, loans are packaged and sold as securities in the secondary markets in the form of mortgage-backed securities (MBS). Perhaps the key difference between the mortgage bonds and MBS is that the former are on-balance-sheet positions, whereas the latter constitute an off-balance-sheet item.

In both cases, loans are pooled by credit institutions into a fund to create a new security. In the case of a mortgage bond, the new security issued is guaranteed not only by the collateral associated with the underlying loans (the so-called “*cover pool*”), used in setting up the new bond, but also by the issuer’s creditworthiness. Covered bonds have been used in Europe for more than 200 years and still represent an important segment of the capital market and a relevant mortgage funding source.

Germany and Denmark were the first two countries to use the cover bond instrument. They were introduced more widely throughout Europe with various degrees of success during the late 1990s (Charts 1 and 2). Spain provides a particularly representative case. *Cédulas Hipotecarias* can be issued by every credit institution supervised by the Bank of Spain. In only two years, these instruments have grown from funding about 20% of housing loans in 2005 to more than 40% at the end of 2007. Even during the current turmoil, the covered bonds have continued to provide liquidity to housing markets in Europe and still represent a higher-yielding alternative to government bonds. France, with the “*Obligations Foncières*”, is another representative case.

In the US, the majority of mortgages is funded through MBS. These securities allow ordinarily non-liquid assets (such as mortgage loans) to be packaged into liquid securities. A pool of loans is transferred to a special purpose entity or a conduit so that these assets can be taken off from the institution’s balance sheet, thus removing the capital charge associated with them. This technique was facilitated by the establishment of the Government Sponsored Enterprises (GSE), such as Fannie Mae and Freddie Mac, which buy mortgage loans from banks and then securitize them. Another goal of these agencies was to develop a secondary market for MBS in order to increase mortgage funding sources and extend home ownership in the US. However, if banks or other mortgage originators do not exercise their due diligence on the mortgages they originate, the MBS market can experience serious problems. The US subprime mortgage crisis is a case in point.

Indeed, as the housing market cooled and mortgage defaults rose, higher than expected losses pushed the MBS market to a halt (Chart 3). GSE were also put under heavy strain, prompting active intervention from the U.S. government and landing Fannie and Freddie in conservatorship. After this event, fully private securitized models became nearly non-existent, posing a question as to which model should be embraced for future funding of residential mortgages in the US.

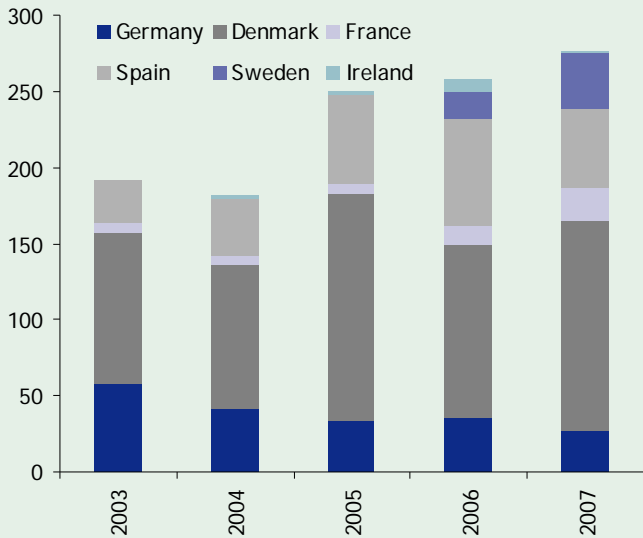
It appears that the covered bonds method for mortgage financing has survived the current global financial crisis relatively well. Indeed, there are two advantages associated with the covered bonds: First, the structure of the housing financing instrument is simple and the identification of the ultimate risk bearer straightforward. Second, the covered bonds do not seem to be highly sensitive to changes in the underlying asset price, in this case, the home prices. This is also reflected in the

* This box is adapted from “Mortgage Finance: Experience Abroad”, BBVA US Regional Watch, First Quarter 2009.

resilience of these instruments during periods of financial turmoil. For example, when compared to MBS, there have not been significant changes in the spreads on the Spanish *cédulas*, despite the deep domestic housing sector downturn (Chart 4). Still it has been more volatile than the German cover bonds as larger housing market correction is expected.

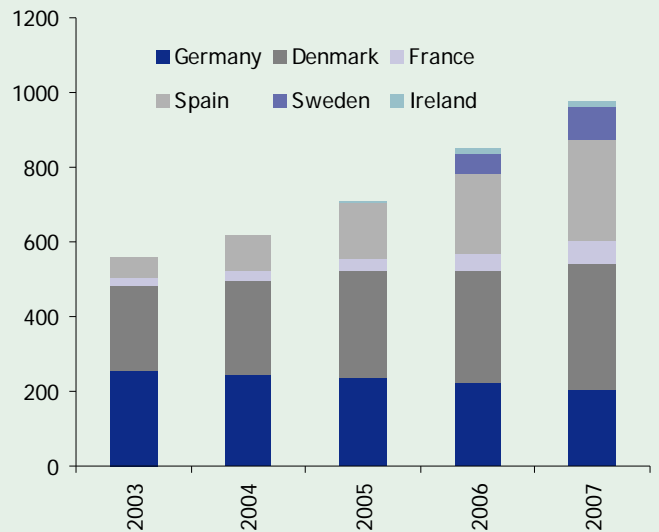
Given these advantages of covered bonds, it may be useful for China to experiment this method of housing finance going forward.

Chart 1: Mortgage bonds issuance
Euro bln



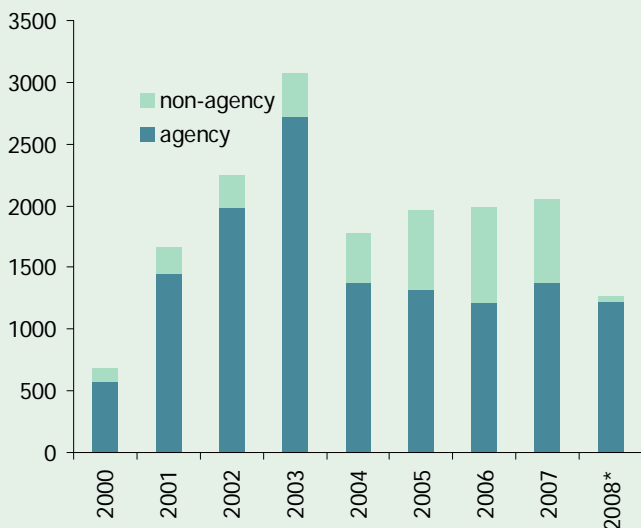
Source: European Mortgage Bond Council.

Chart 2: Mortgage bonds outstanding
Euro bln



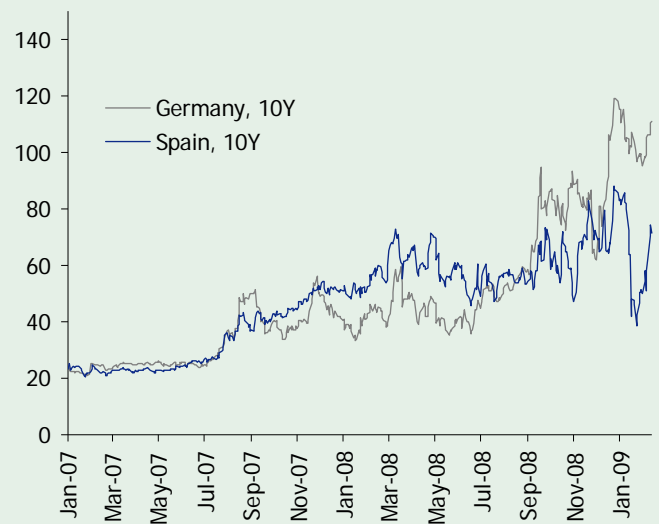
Source: European Mortgage Bond Council.

Chart 3: MBS issuance
USD bln



*Total until November.
Source: Sifma.

Chart 4: Covered bond spreads, bps



Source: Bloomberg.

Box 2: Housing Provident Fund

The housing provident fund is a unique form of housing finance institution in China: It is a fund contributed by both employees and employers. Employees usually contribute 5% to 20% of their salary to the fund with the equal amount matched by their employers. Participating in such a fund allows one to enjoy lower mortgage interest rates than the market rates. In addition, through monthly contribution, one can accumulate savings for a housing purchase that can be drawn as down payment or use the savings accumulated to lower the loan amount.

1) Origins of Housing Provident Fund (HPF)

Before China's economic reform in 1978, there was little private housing ownership in China. Housing had used to be provided by an individual's work unit in the urban area, known as state-distributed housing system. Private housing ownership was allowed as early as in the beginning of the 1980s. However, the majority of households could not afford the high costs of privately-owned housing in the early days of private housing ownership, largely because the wages were controlled at a subsistence level at the early stage of China's economic transition.

In 1991, the housing provident fund was introduced as a pilot program in Shanghai. It was a part of a large housing reform package adopted by the Shanghai municipal government. Similar type of HPF schemes was established in Beijing, Guangzhou, and Tianjin in 1992. This scheme was formally extended nationwide in the urban area in 1995. Through contributions made by both employers and employees, the fund intends to make private housing affordable so that the state can gradually phase out the state-distributed housing system.

In 1998, the State Council decided to completely end the old housing allocation system and elevated HPF's role in financing private housing purchase. The State Council then issued the Housing Provident Fund Management Regulations in March 1999 as a legal framework to standardize HPF contribution and fund management. All prefecture cities were required to set up HPF schemes. In March 2002, the Housing Provident Fund Management Regulations were amended by Decree 350 of the State Council. The amended regulations stipulated that all enterprises (including state, private, and township and joint ventures enterprises), government agencies, public institutions, and social organizations are required to take part in the HPF system. Furthermore, the amended regulation has also standardized the fund usage, financial auditing and supervision, and penalties on violations.

2) How is the HPF financed?

Typically, employees who join the program need to deposit a certain portion of their salary in the range of 5 to 20% in the HPF account. The contributions are then matched one-for-one by their employers. In Beijing's case, an employee usually contributes 12% of his/her salary monthly, at the same time, the employer also needs to pay the same amount to the employee's HPF account, but the total contribution is capped at RMB 2392 no matter how high the employee's salary is. The contribution rate varies across the cities in China, for example, it is only 7% in Shanghai. Once in the program, the employees need to pay for the monthly contributions to the HPF account until they retire. In return, the participants of the HPF will be able to get housing financing loans that enjoy below market mortgage rates from banks. If the employee doesn't buy any housing, the fund can be drawn in a lump sum at retirement.

The HPF is managed via local HPF management centers. They are responsible for daily operations and are directly in charge of fund collection, financial supervision, and loan management. The local HPFs are supervised by the Housing Provident Fund Administration Committee which is appointed by the local government. The responsibility of the Committee includes setting HPF contribution ratios

according to local economic conditions, the maximum amount of HPF loans, approving annual plans and usage of HPF funds. The HPF is primarily deposited in banks and enjoys limited bank deposit rate.

3) Who benefits from the HPF system?

In 2007, only 8.3 million households obtained the HPF loans. Compared with 71.9 million participants, the number looks quite small (Table B2.1). It appears that the people who benefit from the HPF usually have a high income. For those low income participants, it would take a very long time for them to accumulate enough savings in order to be able to use the fund for a down payment and become eligible for a sufficiently large HPF loan to finance a home purchase. For example, it will take more than 10 years for a college graduate who has a monthly income of RMB 6000 yuan per month in Beijing to be able to use his HPF to pay for the downpayment of an apartment at one million yuan. It appears that the HPF loans benefit the high-income households earlier than those low-income households.

Table B2.1: National HPF Accumulation and Usage

	Accumulated funds, bn	Fund balance, bn	Participants, mn	Total Households obtaining loans, mn	Amount of Total Loans, bn	Current Year Data		
						Contribution, bn	Fund Drawn, bn	Loans Issued, bn
2004	750.7	489.4	48.9		340.7	183.7	73.1	106.1
2005	976.0	626.0	62.6	5.2	459.9	235.9	99.3	119.5
2006	1268.4	787.1	69.2	7.0	636.4	292.8	131.6	176.5
2007	1623.0	960.5	71.9	8.3	856.6	354.3	180.9	220.2

Source: Ministry of Housing and Urban-Rural Development

4) HPF plans in largest cities

To what extent HPF can help households to buy their housing depends on the maximum of monthly contribution and HPF loans. In general, the contribution in Shanghai is 7%, less than that in Beijing and Guangzhou. For example, the monthly contribution rate in Beijing is 12%; the maximum monthly contribution cap is RMB 2392; the maximum of loans for a household is RMB 800,000. In Shanghai, the monthly contribution rate is 7%, much lower than that in Beijing; monthly contribution is capped at RMB 1214; and the maximum of loans is RMB 600,000. In Guangzhou, the contribution ratio can vary from a minimum 5% to a maximum 20%; the monthly contribution cap is RMB 7542; and the maximum loan from HPF is RMB 800,000 (Table B2.2).

Table B2.2: HPF comparison among three largest cities

	Beijing	Shanghai	Guangzhou
Maximum HPF Loans	RMB 800,000 for one household	RMB 600,000 for one household	RMB 800,000 for one household
Contribution Rate	12%	7%	5-20%
Monthly Contribution Cap	RMB 2,392	RMB 1,214	RMB 6,698
Coverage 1/	Employers: 53,693; Employees: 3,983,200	Employees: 3,607,700	Employers: 25,318; Employees: 2,039,400
Fund collection in current year 1/	RMB 29.272 billion	RMB 28.248 billion	RMB 17.524 billion
Accumulated Fund 1/	RMB 142.410 billion	RMB 179.5 billion	RMB 80.6 billion
Used Fund 1/	RMB 72.1 billion	RMB 100.2 billion	RMB 42.2 billion
Balance 1/	RMB 70.3 billion	RMB 79.3 billion	RMB 38.4 billion

Note: 1/ Data in Beijing and Guangzhou are in 2007, and Shanghai is in 2008.

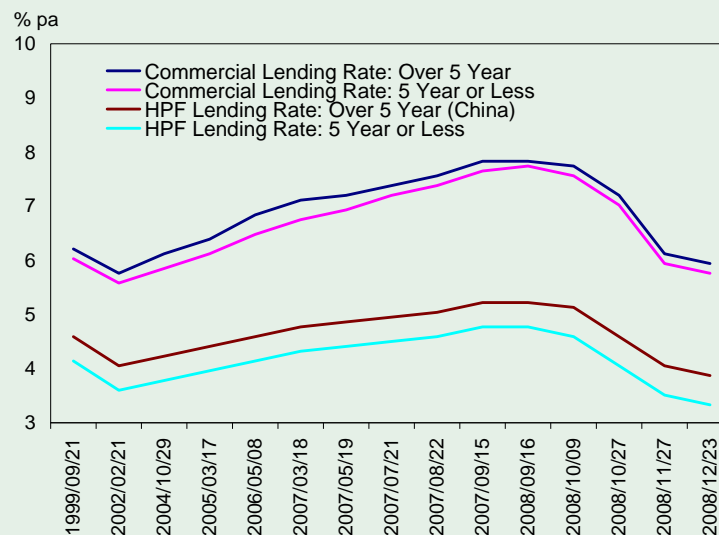
Source: Local housing provident management centers.

5) Comparison between commercial mortgage loans and HPF loans

After the Chinese government ended the housing allocation in 1998, HPF has been a major policy tool to enhance housing affordability for urban residents, which provides a lower interest rate (usually 200 basis points lower) than market-based commercial mortgage loans by banks (Chart 1). For example, the current HPF loan interest rate for 6 to 30 years is 3.87%, while commercial loan interest rate for the same maturity is 5.94%. Even the commercial loans interest rate can be discounted 30% the most qualified customers, namely at 4.158%, they are still higher than the HPF interest rate. Therefore, if households want to apply for mortgage loans, the first choice could be to seek loan applications from an HPF management center. If the loan amount is not enough to cover the housing purchase, they can then go to banks for a second commercial loan to make up the difference.

As shown in Table B2.1, the households that can obtain HPF loans only account for a small portion in the population. As of 2007, total loan amount issued by HPF management centers is RMB 856.6 billion, while the mortgage loans from banks amount to RMB 2962.5 billion, or less than one third of commercial mortgage loans. In term of amount, the commercial loan is much larger than the HPF, and it plays a bigger role in financing the housing purchase.

Chart B2.1: Interest Rate Comparison between Commercial Loan and HPF loan



Source: Wind Economic Data.

6) Challenges ahead

Although the number of individual HPF loans has increased over the years and the average size of HPF loan has also risen, more than half of HPF is still unused and remains idle in the banks. As of 2007, HPF account has a balance of RMB 960.5 billion idled as bank deposits (Table B2.1).

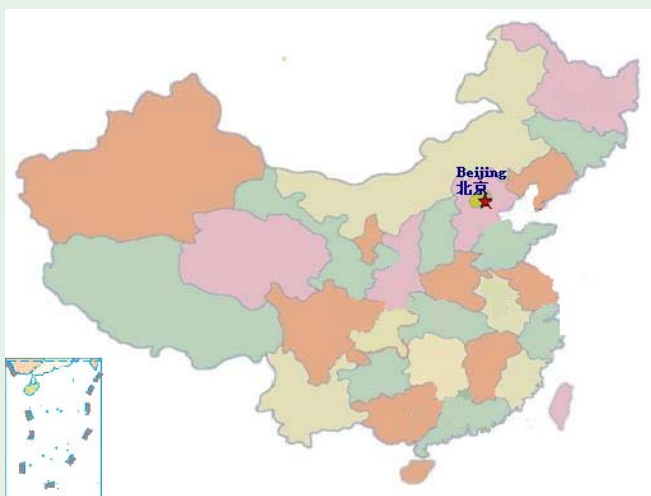
Meanwhile, the housing affordability has clearly declined with the rapid rise in housing prices, as wages can not keep up with the rise in housing costs. However, HPF's role in financing affordable housing purchase has been limited so far. How best to use this unique housing finance institution in China remains a challenge. Part of the solution could be making the fund widely eligible to the young and low income families whose primary interests are in the segment of economical and affordable housing units. Another option is to draw part of the idle HPF to build more affordable housings. In China's massive stimulus package, government intends to build more affordable housing. But due to the tight fiscal revenue in 2009, it is difficult for local governments to raise enough money to finance affordable housing building; on the other side, HPF has a large amount of fund idle in the banks. Thus, feasibility studies should be conducted to allow for local governments to take advantage of HPF to finance affordable housing.

3. How Much Overvaluation Is There in Some Metropolitan Areas?

We use a citywide database that consists of a set of information on the supply and demand conditions for residential property markets for Beijing, Shanghai, Shenzhen, Guangzhou, Chongqing and Tianjin to conduct some econometric analyses, which will allow us to determine whether those cities' housing prices have deviated from their equilibrium prices. The valuation of the equilibrium prices are estimated by an econometric model with a demand and supply framework of fundamental property prices (details see Appendix 2).

Beijing

Chart 9: Beijing and some key statistics

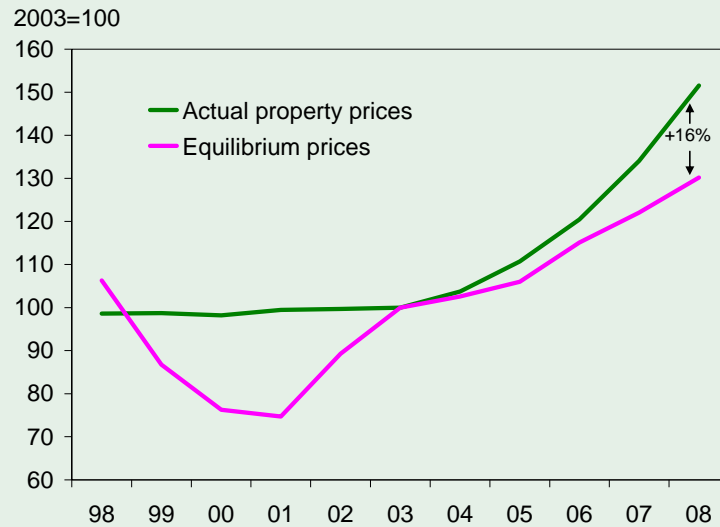


	Beijing
Population size ('000)	12,133
Per capita income (RMB, 2007)	58,204
Average growth from 1998-2008	11.6
Average temperature year round (°C)	11.8
Number of universities	84
Service industry ratio	73.2
Key manufacturing industries	IT, Auto, Petrochemical, Pharmaceutical, etc.

Sources: CEIC and BBVA.

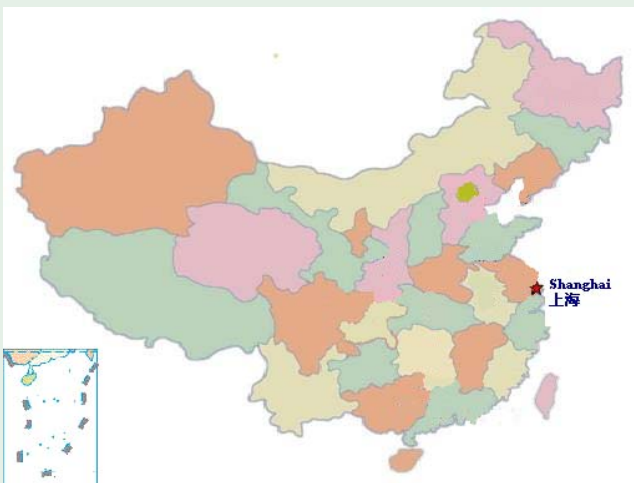
Our estimates indicate that between 1998 and 2002, the actual property prices in Beijing were higher than the equilibrium prices, but the deviation was small (Chart 10). After 2003, the actual price rose very fast by 46% over the last 5 years, while the fundamental factors that determine the demand have not caught up much. Our model estimates suggest there are at least 16% of overvaluation on average in Beijing's housing prices in 2008.

It should be noted that despite the higher deviation of the actual property prices in Beijing from the equilibrium prices, the equilibrium prices have already increased by around 30% in last 5 years, largely driven by population growth and rapid income growth.

Chart 10: Equilibrium property prices in Beijing

Source: BBVA estimates.

Shanghai

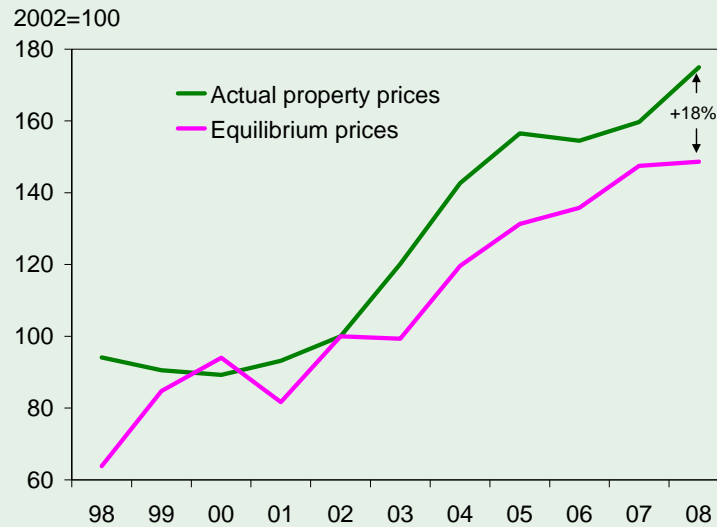
Chart 11: Shanghai and some key statistics

	Shanghai
Population size ('000)	13,789
Per capita income (RMB, 2007)	66,367
Average growth from 1998-2008	11.6
Average temperature year round (°C)	17.8
Number of universities	61
Service industry ratio	37.9
Key manufacturing industries	Auto, IT, Equipment, etc.

Sources: CEIC and BBVA.

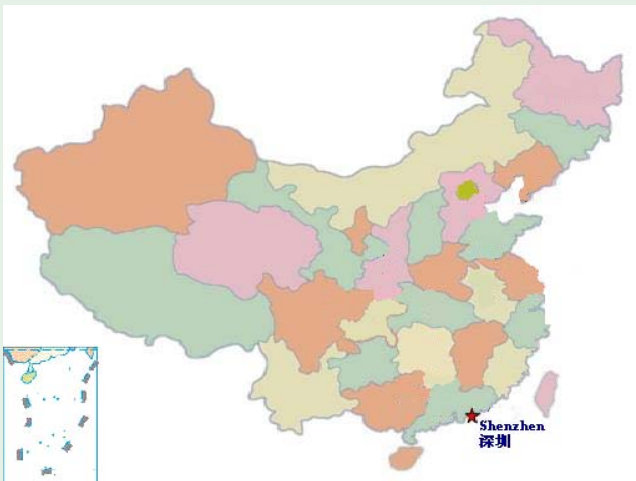
In Shanghai, our estimates show that the actual property prices were mostly higher than the equilibrium prices, except for 2000 (Chart 12). The deviation has been getting larger since 2003, with the actual residential property price having risen over 70% after 2003.

However, propelled by high income growth and limited supply of housing stock, our model estimates suggest the equilibrium prices have also been catching up quickly. Over the same period, they have increased by around 50%. Finally, there is at least 18% overvaluation in Shanghai's housing prices on average in 2008.

Chart 12: Equilibrium property prices in Shanghai

Source: BBVA estimates.

Shenzhen

Chart 13: Shenzhen and some key statistics

	Shenzhen
Population size ('000)	2,124
Per capita income (RMB, 2007)	79,645
Average growth from 1998-2008	15.2
Average temperature year round (°C)	22.3
Number of universities	10
Service industry ratio	53.7
Key manufacturing industries	Electronic, IT, Communications, etc.

Sources: CEIC and BBVA.

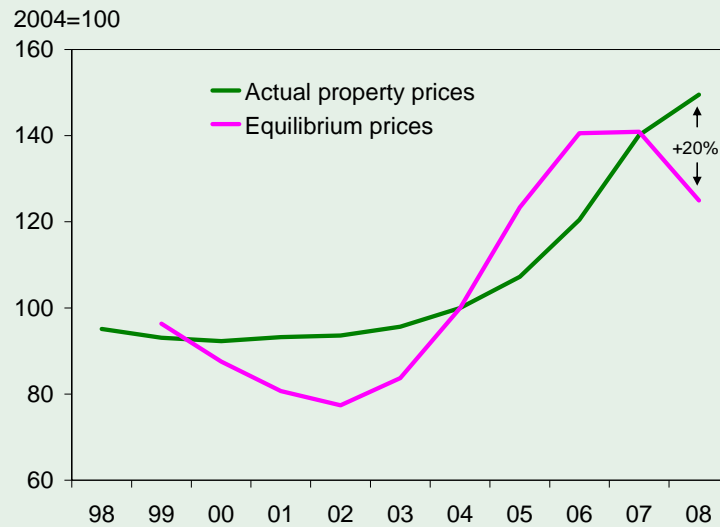
Our estimates show that before 2004, Shenzhen's actual residential property prices were mostly higher than the equilibrium prices. However, the actual prices fell below the equilibrium prices during the period from 2004 to 2007, before recording an overvaluation again in 2008 (Chart 14). The deviation between these prices has been getting large since 2003, while actual price rose over 50% since 2002.

Fast growth in real income and population density were pushing the equilibrium prices to surge in 2002 - 2007, while our model estimates suggest the equilibrium prices had increased by around 80% over the same period mostly affected by these two factors.

However, the equilibrium price fell in 2008. The main reason of falling equilibrium price was the rapid speed of accumulation in housing stocks. During the period of 2007 and 2008, the real investment growth in the residential real estate sector was around 30%, much higher than previous years. The

rapid rise in housing stocks over the same period tends to depress the equilibrium housing price over the period.

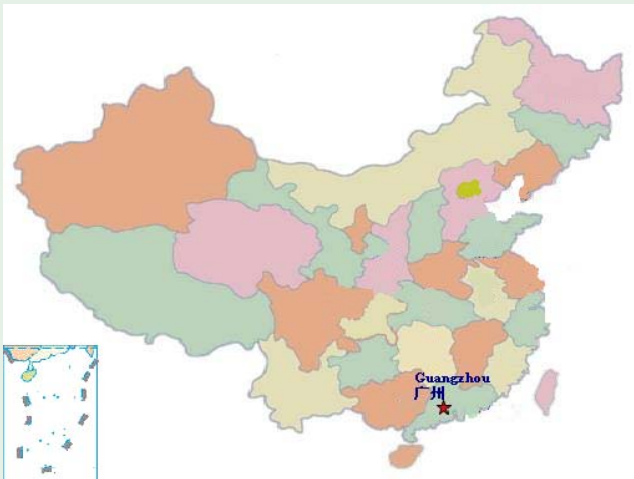
Chart 14: Equilibrium property prices in Shenzhen



Source: BBVA estimates.

Guangzhou

Chart 15: Guangzhou and some key statistics



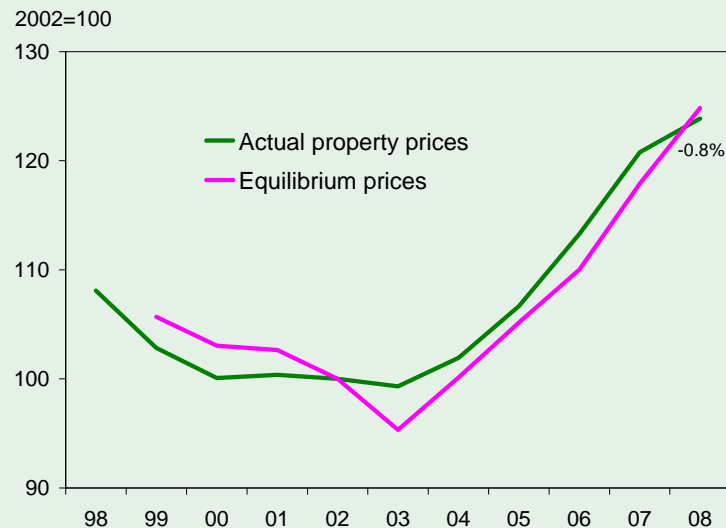
	Guangzhou
Population size ('000)	7,735
Per capita income (RMB, 2007)	71,808
Average growth from 1998-2008	13.7
Average temperature year round (°C)	21.8
Number of universities	29
Service industry ratio	41.0
Key manufacturing industries	Electronic, Auto, Pharmaceutical, etc.

Sources: CEIC and BBVA.

Guangzhou's property price developments exhibited a different picture from the previous three large cities in China. Although the actual property prices were slightly higher than the equilibrium prices during 2002 – 2007, the deviations of the actual prices from their equilibrium prices were quite small. Indeed, when growth in property prices slowed in 2008, the actual price was slightly below the equilibrium price by 0.8% (Chart 16).

The actual and equilibrium property prices rose by 20% during 2002 – 2008, largely supported by high real income growth while the growth in population and housing stocks were quite stable. There is little overvaluation in Guangzhou over the decade.

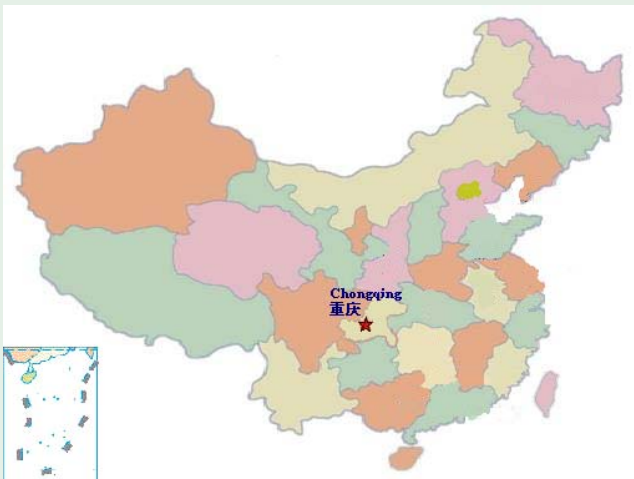
Chart 16: Equilibrium property prices in Guangzhou



Source: BBVA estimates.

Chongqing

Chart 17: Chongqing and some key statistics



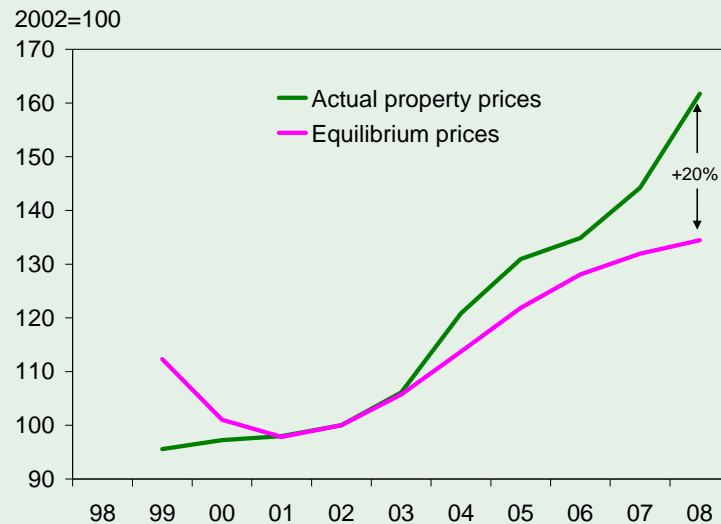
	Chongqing
Population size ('000)	32,353
Per capita income (RMB, 2007)	14,660
Average growth from 1998-2008	11.0
Average temperature year round (°C)	18.6
Number of universities	40
Service industry ratio	58.4
Key manufacturing industries	Auto, equipment, Electronic, IT, etc.

Sources: CEIC and BBVA.

Our empirical estimates show that Chongqing's actual property prices have been higher than the equilibrium prices since 2003 (Chart 18). The deviation was getting larger than before since 2006. While Chongqing's actual residential property prices rose by over 50% in the last 5 years, its per capita income growth has not. Our analysis suggests the overvaluation of property price is at least 20% on average in 2008.

Despite the high deviation of the actual property prices in Chongqing from its equilibrium prices, the equilibrium prices have already increased by around 27% in last 5 years, largely driven by population growth and rapidly income growth.

Chart 18: Equilibrium property prices in Chongqing



Source: BBVA estimates.

Tianjin

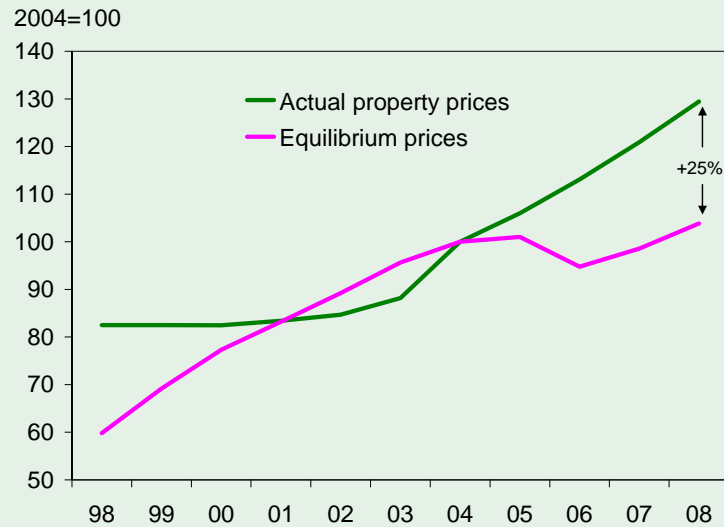
Chart 19: Tianjin and some key statistics



Sources: CEIC and BBVA.

	Tianjin
Population size ('000)	9,591
Per capita income (RMB, 2007)	46,122
Average growth from 1998-2008	13.3
Average temperature year round (°C)	12.0
Number of universities	44
Service industry ratio	51.0
Key manufacturing industries	Chemical, Auto, Electronic, Metallurgy, etc.

Tianjin's actual property prices rose by around 50% in the last 5 years. However, our model estimates suggest the equilibrium prices have just increased by around 10% over the same period (Chart 20), led by steady growth in per capita real income and limited growth in urban population. As a result, Tianjin's overvaluation is at least 25% on average in 2008.

Chart 20: Equilibrium property prices in Tianjin

Source: BBVA estimates.

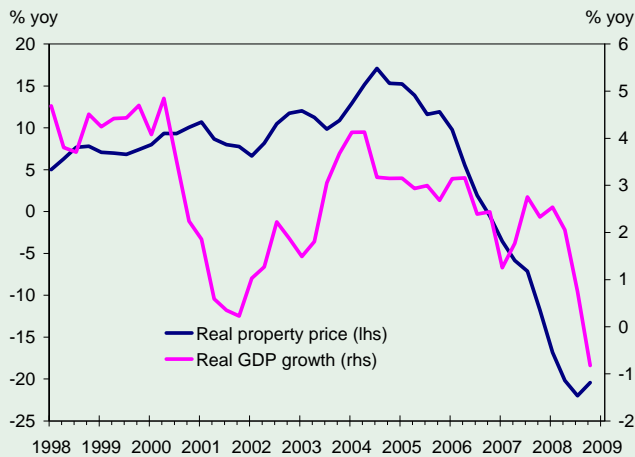
In conclusion, it appears that some regional markets, except Guangzhou, have experienced some overvaluation as high as 25%. Looking forward, some downward adjustments in these regional markets are expected on slowing economic growth and rising unemployment rate. However, a hard landing of property prices in these cities is not possible, either, because of their locations, status as a regional economic centers, and attractions for young, highly-educated and high-income population.

4. The Outlook for the Chinese Real Estate Market

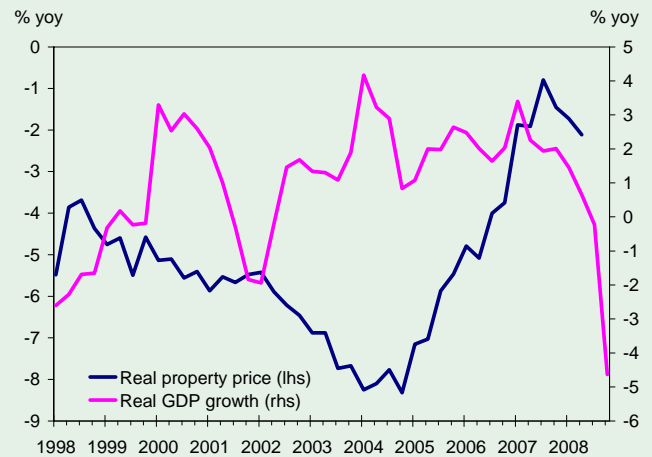
As shown in the previous section, our valuation analysis suggests that housing prices in some key cities, except for Guangzhou, are currently overvalued by up to 25%. Under the current economic downturn, will the Chinese property market experience a hard landing? Before answering this question, we need first look at some cross-country experiences between economic cycles and housing prices.

Housing prices and business cycles:

Before the burst of US housing bubble, it appears the correlation between business cycles and housing prices may have disappeared. Indeed, there did not appear to be a relationship between the property prices and the real GDP growth before 2004 in the US (Chart 21). However, this relationship has become highly correlated after the collapse of the real estate bubble in the US. The sharp fall in the US housing prices has been weighing on real GDP growth since then.

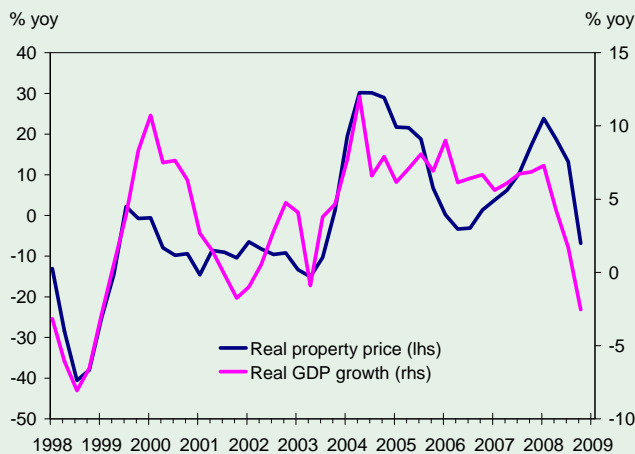
Chart 21: US Real Estate and Business Cycle

Sources: Datastream and BBVA estimates.

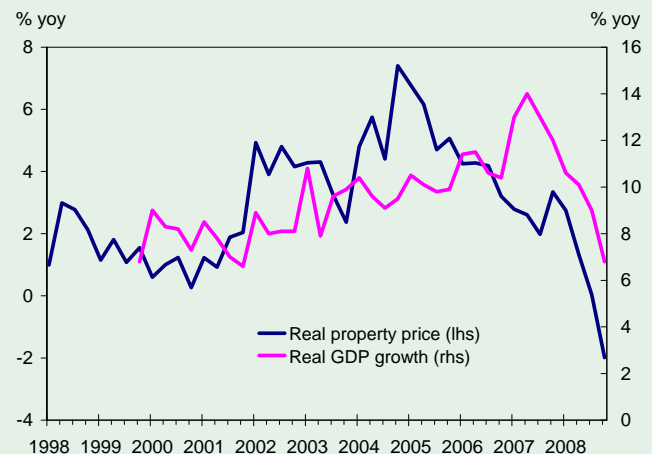
Chart 22: Japan Real Estate and Business Cycle

Sources: Datastream and BBVA estimates.

Note: National average of urban land prices as proxy of property prices.

Chart 23: Hong Kong Real Estate and Business Cycle

Sources: CEIC and BBVA estimates.

Chart 24: China Real Estate and Business Cycle

Sources: CEIC and BBVA estimates.

In the case of Japan, it is well-known that the burst of real estate bubble led to Japan's lost decades. Although the Japanese economy experienced some sporadic recovery in economic growth, the growth momentum has been quite anemic, largely pulled down by a banking system whose balance sheet was badly damaged by the collapse of the property sector.

The business cycle and housing price relationship has been more prominent in Hong Kong over the last decade. The collapse of the housing bubble in 1998 amidst the Asian financial crisis has a large negative wealth effect on private consumption, which in turn affected economic activities in Hong Kong.

The same relationship in China also appears to be quite close, with the economic activities tend to lead changes in property prices. Our calculation shows that the lag length is about 1 to 2 quarters. In addition, real estate development has become increasingly important to local economic developments, as real estate related activities have become an important source of revenue for local governments. Over the years, revenues collected from local real estate related activities have stayed at around 20% of the total local government tax revenues. In certain locales, the dependence for land sales and other real estate related activities could be much higher than the average numbers presented here.

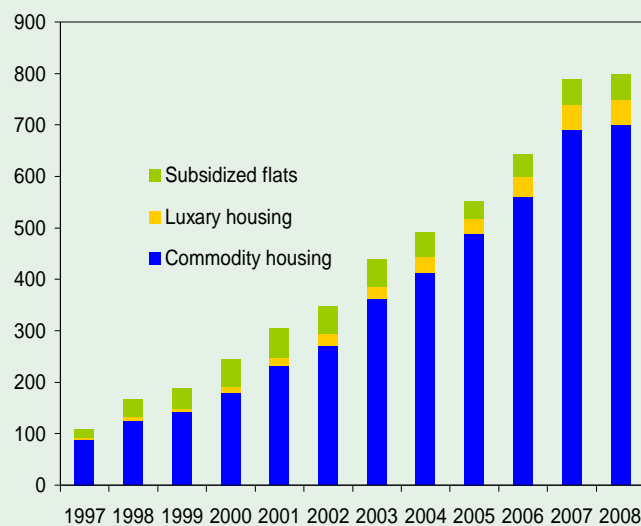
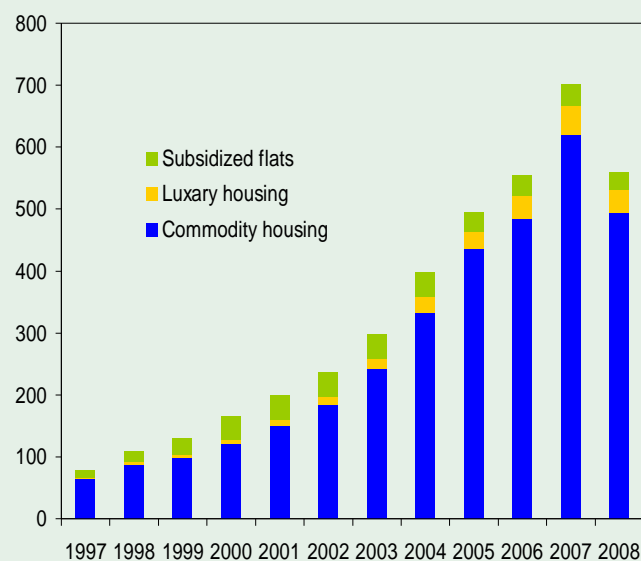
Table 3: Government Revenues from Real Estate Sector

		2002	2003	2004	2005	2006	2007	2008
Total value of land purchased	RMB bn	146	205	257	290	378	487	579
Local government revenue	RMB bn	852	985	1,189	1,510	1,830	2,357	2,864
(% share to local gov't revenue)	%	17.1	20.8	21.6	19.2	20.7	20.6	20.2

Source: Wind.

Downward price adjustments unavoidable:

Given the close relationship between China's housing price and business cycle, we can see a downward price adjustment will be unavoidable in the current economic downturn. Because of rather high growth in real estate investment over the last two years, many projects are expected to be completed in 2009 and 2010. At the national level, we do see some oversupply in the near term, especially in the category of commodity housing segment (Charts 25 and 26).

Chart 25: Housing completed (Millions of sq m)**Chart 26: Transaction volumes (Millions of sq m)**

Given the completed square areas and using different sales volume based on some assumptions, we find that it will take 3 to 4 years to digest the current existing new stock of housing. This supply factor is likely to continue to put downward pressures on existing housing prices in China.

Table 4: Expected Time to Sell out the Existing Stock of Floor Space

Assumption on selling speed	Date of sell out
Same as in 2008	Nov 2012
Average of previous 10 years	Oct 2014
80% of 2008 transaction	Oct 2013

Sources: Wind and BBVA estimates.

As shown in our valuation analysis in the previous section, there are up to 25% overvaluation in some key cities in China. This could be the benchmark for further price adjustment in these cities. However, this does not exclude the possibility in some cities that price overshootings may also be a possibility. Given there is not much over valuation at the national level, our forecasts for the national level was about 5-10%.

We do not think housing prices in China will experience a hard-landing. In addition, this downward price adjustment will not be a long-lasting one, either, as what experienced in Japan, Hong Kong, and the US, largely because of some favorable factors such as demographics, rapid urbanization trend, high demand for quality housing, and emerging demand for housing as an asset class in investment portfolio.

Other than these longer-term structural issues, both central and local governments have reacted quickly by issuing various supply management and demand stimulus policies (Appendix 1). Furthermore, reduced interest rates and loosening lending policies towards the real estate sector also help stimulate the property sectors. In addition to these existing policies, we think further policy initiatives are still needed to prevent a hard landing scenario from materializing. Here are some proposals.

Demand policies: In general, we think local government policy initiatives to reform resident registration system to expand urban population can help stimulate demand, thus easing the fall in residential property prices. Indeed, some local governments have already used housing purchases as an incentive to gain urban resident registration. This policy could go even further by setting up a set of transparent qualification criteria to allow migrants to gain residency in urban areas. The Shanghai experiment that allows non-residents to obtain residency with specific criteria to qualify is a right step in the right direction. These measures will not only speed up the urbanization process in China but also help alleviate short-term surplus of housing units in the urban area.

Supply policies: Accelerated urban renewal program helps create demand for existing stock of surplus housing. Indeed, from our field interviews, cities such as Chongqing, Tianjin, and Qingdao have ambitious plans to engage in large scale urban renew programs in the coming years. These urban renewal programs will involve demolition of old city districts and immediately create demand for people who will be permanently or temporarily relocated out from the affected area. However, this policy also needs to be sensitive to the demand of people who are going to be relocated so as not to stir up social resentments and discontents.

Constructing more and providing affordable rental housing by local governments for low income families and migrants is a good policy to solve the housing problem for the poor. Such policies will not have much impact on existing housing prices as this segment of the population can not afford to buy into the current market given their income level and savings.

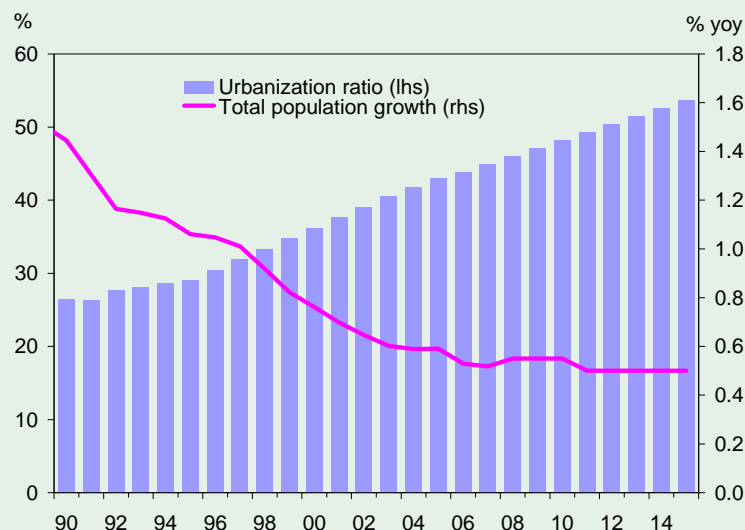
However, because of the current economic downturn, more government-provided economic housing for low-income and middle-income people at this juncture is likely to push the current housing prices down further, thus risking a hard landing of the property prices in some urban areas. The Hong Kong experience in 1998 could be illustrative. In order to avoid such pitfalls, the government must use stringent income test (exclude upper-middle income and high-income people), location test (ban expensive urban areas for such housing projects), and other useful criteria such as residency requirement to ensure the policy will not affect existing housing prices in a significant way.

Finally, reform in housing finance should also help stimulate demand and reduce costs of real estate development projects. Covered bonds as discussed in Box 1 could be a useful financial innovation for China to adopt quickly as it requires less legal hurdle and has a proper incentive structure between mortgage origination and distribution. Such mortgage finance innovation will help reduce risk concentration in commercial banks and make mortgage loans more accessible to the qualified general public. In addition, China should also allow experiments with an aim to eventually adopt some latest innovations in real estate financing tools such as REITs (Box 3). Such a financing instrument will widen financing channels for real estate developers and possibly reduce development risks and financing costs.

Bright long-term outlook

While there appears to be excess supply in China's residential property market, the oversupply can be digested quickly by innovative demand and supply policies as demand for housing remains robust if prices are right. Favorable structural factors such as fast income growth, rapid urbanization, very high population density, and high depreciation of housing stocks, especially among those built in the 1980s or earlier, made possible by expedient urban renew programs, all bode well for great long-term investment potentials.

Chart 27: Urbanization and Population Growth



Sources: United Nation Database and CEIC

Note: Population growth is based on United Nation's forecast for 2008 and onward.

Box 3: REITs in China?

1) History of REITs

Real Estate Investment Trust (REIT), similar to a mutual fund that invests in stocks, is a collective investment vehicle formed to invest in real estate properties in order to generate income streams for its investors. From developers' perspective, REITs can be used to unlock capital in real estate that they own and redeploy it to other high-yielding business. REITs can also be an effective vehicle to move real estate assets off the balance sheet and help create liquidity. The first REIT was set up in the US in 1960. Since then, many Asian economies have adopted the REITs, including Hong Kong and in 2005 (Table B3.1).

Usually there are three types of REITS:

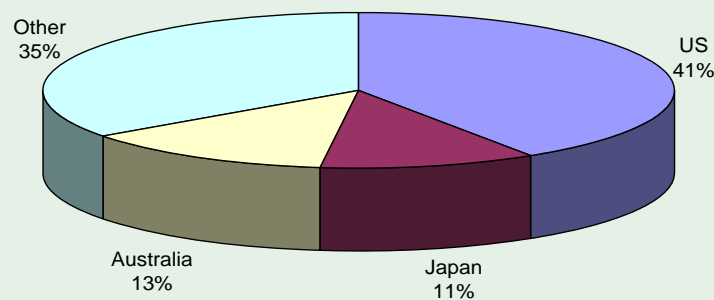
- Equity REITS mainly hold commercial housing like office buildings, shopping malls, warehouses, etc., and the income is generated from rental and real estate appreciation.
- Mortgage REITS invest funds in mortgage loans. Income is mainly generated from fees and interest.
- Hybrid REITS can conduct both equity and mortgage investment. Income is generated from rental, interest and asset appreciation.

REITs have become a common investment vehicle in developed markets. There are about 390 listed REITs around the world by the end of February of 2009; among them, the US has the most of REITs, accounting for 41 percent in number of REITs. Australia and Japan took the second and third place in terms of the number of listed REITs, accounting for 13% and 11%, respectively (Table B3.1 and Chart B3.1).

Table B3.1: Timeline for REITs evolution

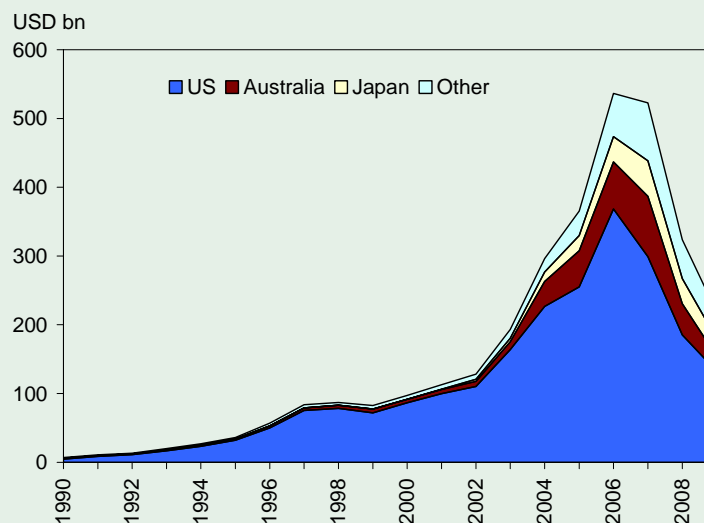
Country	Date of Introducing REITs
USA	1960
Netherlands	1969
Australia	1971
New Zealand	1982
Canada	1993
Belgium	1995
Turkey	1998
Japan	2001
Singapore	2002
Korea	2002
France	2003
Taiwan	2005
Hong Kong	2005
Malaysia	2005
Thailand	2005
UK	2007
Germany	2007
China	2009*

Sources: *The Colonial First State Research and Various Official Announcements.*
 Note: * Estimated introduction date.

Chart B3.1: Composition of the Existing Global REIT Market (390 of listed REITs as of 2008)

Sources: Thomson One Banker and BBVA estimates.

Despite its long history, REITs did not really take off until 2000, largely driven by the boom in the housing markets of the US and other countries. In term of market capitalization, US has more than 50% share in the worldwide REITs. At the peak, the total market value of REITs amounted to USD 540 billion, with USD 360 billion attributing to US REITs. However, after the bursting of housing bubble, the market value of REITs shrunk by more than 50% from its peak. (Chart B3.2).

Chart B3.2: Global REIT market capitalization

Sources: Thomson One Banker and BBVA estimates.

2) REITs in China

As of now, China's investment trusts (different from REITs) can also invest their funds in the real estate sector. Usually, the underlying assets can be development loans, commercial housing or mortgage loans. However, these trusts only cover a small scope, and usually limit the number of individual investors. According to "The Measures for the Administration of Trust Companies' Assembled Funds Trusts" by the People's Bank of China in 2007, there should be no more than 50 individual investors in each trust, but no limitation on institutional investors. Therefore, the current investment trust regulation limits the scope of investors.

In order to stimulate the flagging real estate market by widening financing channels of the real estate developers, the State Council in one of its regulatory reform documents in December 2008 finally gave a green light to allow the start of trials of REITs. Because of stagnant housing sales and a halt in the IPO market, the Chinese property developers should be enthusiastic about the emergence of REITs. As it stands now, Tianjin Coastal Area, Shanghai Pudong Area and Shenzhen could be the first places to start the experiments.

The People's Bank of China (PBOC) and the China Banking Regulatory Commission (CBRC) are in the process of formulating appropriate REIT rules. However, there is no timeline for the new regulatory guidelines on REITs to be announced. If the REITs are to be traded in stock exchange, then it will also involve the China Securities Regulatory Commission (CSRC).

3) Regulatory Framework in Other Economies

REIT regimes tend to vary significantly among jurisdictions. It is likely that the REIT regulatory framework currently being considered in China will lean towards the Hong Kong model. The Hong Kong model has high investor protection, must be listed on a public exchange, is prohibited from being internally managed, and is required by the oversight of an independent trustee. Furthermore, they are under strict limitations as to the amount of gearing (generally less than 45%); the requirement of annual property appraisals; and the limitation on affiliated party transactions, etc. (Table B3.2).

Table B3.2: The regulatory framework in Asia

	Hong Kong	Singapore	Japan	Australia	Korea	Taiwan
Management	External	External	External	Internal or External	Internal or External	Internal or External
Ratio for real estate investment	100%	70% above	75% above	Rental income 50% above	70% above	75% above
Overseas investment	Yes	Yes	Yes	Yes	Yes	Approval needed
Uncompleted projects/lands	10% of total assets	20% of total assets	Yes	Conditional Yes	Conditional Yes	Forbidden
Liability	45% of total assets	35% of total assets	No limitation	No limitation	67% of total assets	35% of total assets
Payout ratio	90% above of after-tax income(No depreciation)	90% above of after-tax income(No depreciation)	90% above of after-tax income(No depreciation)	90% above of after-tax income(No depreciation)		90% above of after-tax income(No depreciation)
Open or close end	Close end	Close end	Close end	Close end	Close end	Close end mostly
Going public or not	Going public	Going public	Going public	Both	Both	Both

Source: China Real Estate Financing Strategy Report 2008.

4) When are we expected to see the first REIT in China?

While property developers and investors are eagerly awaiting the introduction of a China REIT, some key regulatory hurdles such as double taxation and property right registration must be resolved going forwards. Indeed, double taxation is particularly troublesome that may turn investor away from REIT products. As commercial housing should be the main investment instruments for REITs, the involvements of residential developers are also key to the success of China's REITs.

In conclusion, the current economic environment should be conducive for the emergence of REITs in China. However, key regulatory hurdles must be overcome as well. Though it will take time and involve various government departments and regulatory bodies, we are optimistic about its quick emergence in China in the near future.

Appendix 1: The Latest Policies to Revitalize the Housing Market

Amidst the current global financial and economic crisis, the government has quickly reversed its tightening monetary policy and has taken various measures to support the property market since October 2008:

22 October, 2008: The government decided to lower housing transaction taxes and to provide preferential interest rates to first time home buyers. Maximum loan amount allowed to be lent by the housing provident fund was also raised to up to 1.2 million RMB in some regions.

11 December, 2008: The Ministry of Finance, the State Administration of Taxation and the People's Bank of China concerted announced new tax exemption on house purchases, adjusting the minimum down-payment to 20% from the previous 30%, mortgage interest rate cut by 0.27% for first time home buyers.

23 December, 2008: The State Council decided to waive taxes on property sold two years after purchase, down from five years. The People's Bank of China issued rules for lending to developers of low-cost and economically affordable housing, offering loans at a 10% discount to the benchmark rate. However, the loans must be no more than five years and can't exceed 20% of total investment in a project.

2 January, 2009: The central government pledged to provide more affordable homes to accommodate the low-income population and plans to spend 900 billion RMB on the next three years to build such homes.

15 January, 2009: The authorities are considering a pilot project to allow property developers to raise fund through investment trusts to ease their credit constraints. However, major regulatory hurdles would have to be overcome (See Box 3).

Table A1.1: Provincial and Local Policies to Revitalize the Real Estate Sector since 2008

Date	Province/ City	Policy descriptions
May 2008	Shenyang	Real estate transaction deed tax decreased from 4% to 1.5%.
June 2008	Chengdu	1. Relaxation on deed tax with financial subsidy; 2. Preferential housing provident fund loan policies; 3. Non-permanent residents are eligible to apply for housing provident fund loans with 20% down-payment, maximum loan amount to 3 million and loan period to 30 years.
22 July 2008	Changsha City	The city government started to provide preferential policies on land, financing and taxation for real estate developments.
1 August 2008	Xiamen	Non-residents who purchase an apartment of 70 to 80 Sqm can become permanent residents. Mortgage interest rates under housing provident fund adjusted downward for houses with a construction area below 144 sqm.
4 August 2008	Fuzhou	Relaxation of deed tax by half to promote healthy and stable real estate development; provident fund loan period extended to 30 years.
12 August 2008	Chongqing	Chongqing government encourages rural farmers to purchase houses in the city to promote urbanization.
23 August 2008	Henan	The downpayment for owner-occupied housing was lowered from 30% to 20% and the loan period could be extended to 20-30 years. Purchasers of economically affordable housing could be exempted from transaction tax;

		for those who bought commodity housing unit can obtain real estate transaction tax relief.
September 2008	Liaoning	The housing provident fund loan was extended with longer maturity and non-local applications can also for HPF loan.
1 September 2008	Changzhou	Five new policies on housing provident fund loans: 1. Couples who meet the loan criteria could have an increase in maximum loan amount from 300,000 to 400,000. If one of the couples meets the loan criteria, the maximum loan amount could also increase from 180,000 to 240,000. 2. Applications for housing provident fund loans more than twice could have a down-payment reduction from 40% to 30%. For those who purchase affordable houses and houses on or below 90 sqm, down-payments are reduced to 20%. 3. Abolish the upper limit on housing provident fund loans for those who applied more than twice, but the maximum loan amount will be equivalent to first time application. 4. Non-permanent residents, who had housing provident fund loan system outside the city but would like to purchase houses, are eligible to apply local housing provident fund loans as long as they meet the loan criteria. 5. Home owners could switch from commercial housing loan scheme to housing provident loan scheme as long as their commercial housing loans are fully amortized.
1 September 2008	Wuhu	For home buyers, the downpayments for HPF were lowered and real transactions taxes are also lowered. For developers, the government offers to adjust land supply, taxation implementation, and land purchases.
4 September – 31 December 2008	Xian	1. Residents who purchase housing with an area of below 90 sqm (including 90 sqm or second-hand housing below 144 sqm) in six districts of Xian City could enjoy government financial subsidies up to 1.5 percentage of total housing value. 2. Purchase of housing within 90-144 sqm could have 1% government financial subsidies of total housing value. 3. Residents who purchase commodity houses or second-hand houses larger than 144 sqm could have government financial subsidies at 0.5% of total housing value. 4. Commodity housing projects scheduled on or before 30 June 2009 could have a 35 RMB/sqm reduction on urban infrastructure facilities cost, which originally costs 150 RMB/sqm.
19 September 2008	Nanjing	1. Residents who purchase ordinary houses from 1 October 2008 to 30 September 2009 could obtain subsidy, but the amount is subject to the purchased area. Home purchases of a 90 sqm or below (including second-hand housing) enjoy 1% rebate of total housing value; Home purchases within 90-144 sqm (including second-hand housing) could enjoy a 0.5% rebate. 2. Before 30 September 2009, real estate developers could defer payment or pay on an installment basis for infrastructure facilities costs and civil defense construction costs.

22 September 2008	Wuhan	Employees from four types of enterprises are added into the housing provident fund system.
7 October 2008	Beijing	Beijing relaxed some rules for pre-sale permit of development projects.
13 October 2008	Hanzhou	The city government released a publication "Opinions on promoting a healthy and stable real estate markets in Hanzhou".
14 October 2008	Shanghai	Maximum housing provident fund loan amount was adjusted up to 600,000 per household. A 14-point policy was announced to lift the city's residential property market. Key measures were: cutback on deed tax from 1.5% to 1.0% for first-time buyers to purchase an apartment at less than 90 sqm; stamp duty and land value-added tax waiver; 0.27 percentage points reduction in bank loan interest rates; maximum discount of 30% for first-time buyers (previously 15%) on the benchmark interest rate; minimum down-payment ratio of 20% (previously 30%); and lowering individual housing provident fund loan rates by 0.27 percentage points.
22 November 2008	Nanning	Farmers in rural areas can cash in on new land policies and move to the cities. Farmers can swap their land use rights for a sum of money, which can be used to settle in the provincial capital. In addition, stamp duty and land value-added tax have been waived for individual buyers.
3 March 2009	Guangdong	Three measures to stimulate the real estate market development: A. RMB 200 million additional investment to build affordable housing from 2009-2011. B. Measures to encourage home purchase, specifically: <ul style="list-style-type: none"> • Restrictions on second-home purchase are relaxed. • Commercial mortgage loans approved before 27th Oct, 2008 can also enjoy the lowest preferential interest rate. • Housing provident fund loans raised from RMB10, 000 to RMB20, 000 and the loan duration lengthened to 30 years. • Business tax is exempt for selling a property that has been held for two years or more. • Deed tax is lowered to 1% for first-time buyers. • Hong Kong, Macau and Taiwan residents could have same benefits as local residents on housing purchase. C. Measures to provide reliefs to real estate developers <ul style="list-style-type: none"> • Payment on transfer of land-use rights can be deferred. • Land value-added tax can be paid by installment within the due date. • Offshore listings or A Share listings by local real estate developers are encouraged with facilitation of the relevant department of the government.

Sources: Various official sources and news.

Appendix 2: Estimation method

To estimate the equilibrium property prices, we use the demand-supply framework of fundamental property prices.¹ Under this framework, if the housing market adjusted to shocks instantaneously, then the model could be closed at the equilibrium:

$$p_t^{d^*} = p_t^{s^*} = p_t^* \quad (\text{A2.1})$$

In the long-run demand equation, the determinants include housing stocks (s), per capita household income (y), real user cost of residential capital (measured in real interest rate; rr) and population density ($dens$). To obtain the long-run demand price p^{d^*} , we use an inverted housing demand function as follows:

$$p_t^{d^*} = \alpha_1 s_t + \alpha_2 y_t + \alpha_3 rr_t + \alpha_4 dens_t \quad (\text{A2.2})$$

The coefficients of income and population density should be positive ($\alpha_2, \alpha_4 > 0$), while housing stock and user cost are expected to be negative ($\alpha_1, \alpha_3 < 0$).

On the supply side, it is assumed that market entry and exit ensure that property developers make zero profits in the long run. Therefore, given the construction cost (c), the long-run supply price, p^{s^*} , induces a sufficiently high investment rate to cover depreciation and expected housing stock growth. This relationship can be expressed as follows.

$$p_t^{s^*} = \alpha_5 \left(\frac{i}{s} \right)_t + \alpha_6 c_t \quad (\text{A2.3})$$

where i/s is the investment rate; i , the real residential investment, is proxied by fixed asset investment (FAI) for real estate adjusting by FAI deflator and c is the real construction cost. Since higher prices encourage investment, the coefficient of the investment rate is expected to be positive ($\alpha_5 > 0$). Property prices are expected to respond to construction cost positively ($\alpha_6 > 0$).

After confirming the existence of long-run relationship by applying co-integration tests, we estimate the short-run price dynamics by using an error-correction mechanism.

The short-run demand equation is as follows:

$$\Delta p_t = \lambda_d (p_{t-1} - p_{t-1}^{d^*}) + \beta_0 + \beta_1 \sum_{i=0}^4 \Delta y_{t-i} + \beta_2 \sum_{i=0}^4 \Delta w_{t-i} + \beta_3 \sum_{i=0}^4 \Delta rent_{t-i} + \beta_4 \sum_{i=0}^4 \Delta dens_{t-i} + \beta_5 \sum_{i=1}^4 \Delta p_{t-i} \quad (\text{A2.4})$$

where w is the real household wealth proxied by Shanghai Stock Exchange Composite Index deflated by CPI and $rent$ is the real rental index deflated by CPI.

The short-run supply equation is as follows:

$$\Delta \left(\frac{i}{s} \right)_t = \lambda_s (p_{t-1} - p_{t-1}^{s^*}) + \theta_0 + \theta_1 \sum_{i=0}^4 \Delta p_{t-i} + \theta_2 \sum_{i=0}^4 ygap_{t-i} + \theta_3 \sum_{i=0}^4 \Delta q_{t-i} + \theta_4 \sum_{i=1}^4 \Delta s_{t-i} \quad (\text{A2.5})$$

where $ygap$ is the output gap; and q is the new floor space completions of residential buildings.

The deviations of the observed housing prices p from $p^{d^*} = p^{s^*}$ will give us an indication as how much the actual price are overvalue or undervalued relative to the equilibrium long-term price.

¹ See McCarthy and Peach (2004), "Are home prices the next 'bubble'?" *Economic Policy Review*, Federal Reserve Board of New York. In addition see Leung, Chow, and Gao, (2008), "Long-term and short-term determinants of property prices in Hong Kong," Hong Kong Monetary Authority, for an application of the similar approach that applies to the Hong Kong property market.