ARE HOUSE PRICES RISING TOO FAST IN CHINA?

A. Ahuja, L. Cheung, G. Han,

N. Porter and W. Zhang

Second Annual International Conference
on the Chinese Economy

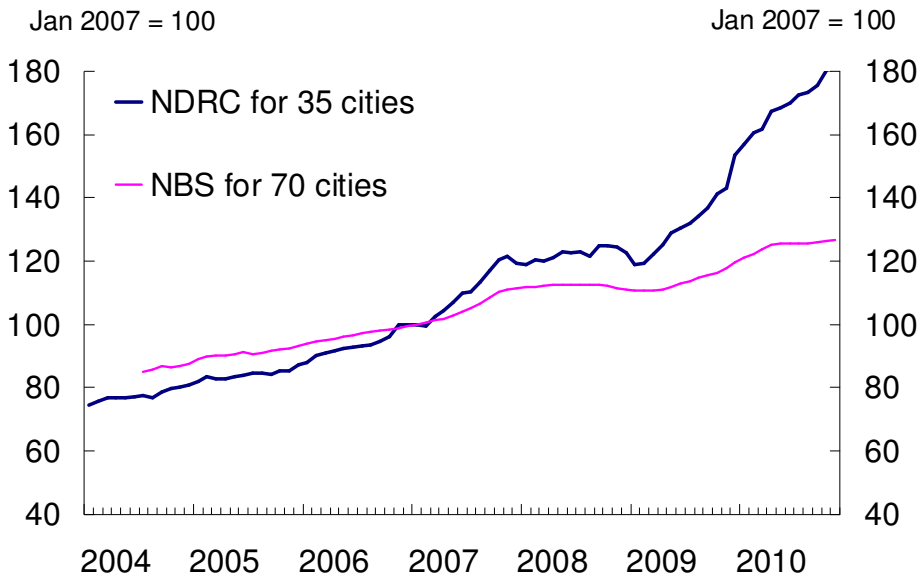
Hong Kong, 13-14 January 2011

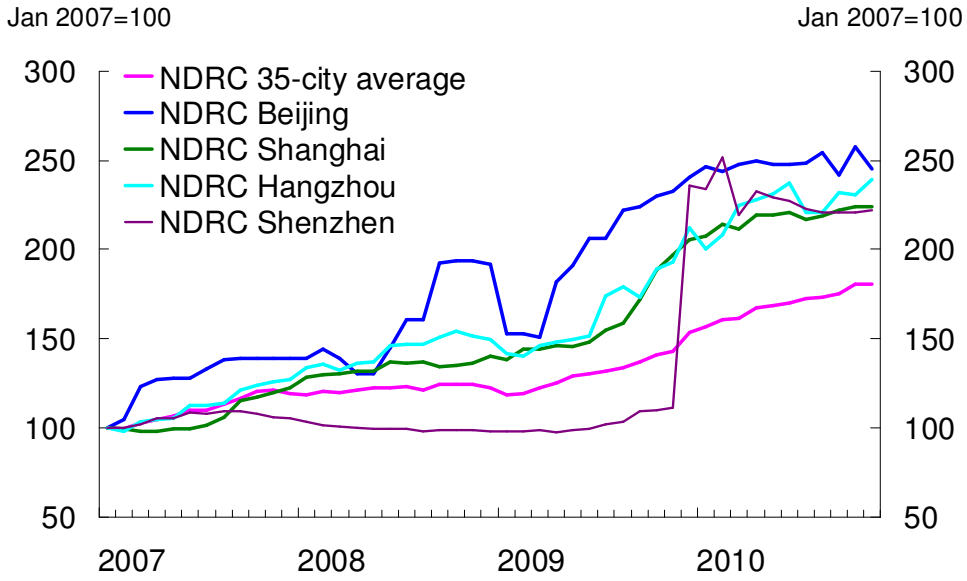
Outline

- Motivation
- Are house prices rising too fast?
  - Demand-supply model
  - Asset pricing model
  - Policy implications
- Impact of property price adjustments on
  - Domestic demand
  - Banking sector
  - Government revenue
- Conclusion

Motivation (1)

- Property prices in major cities are rising fast
  - January 2009 – November 2010: Beijing +60%, Shanghai +62%, Hangzhou +69%, Shenzhen +126%

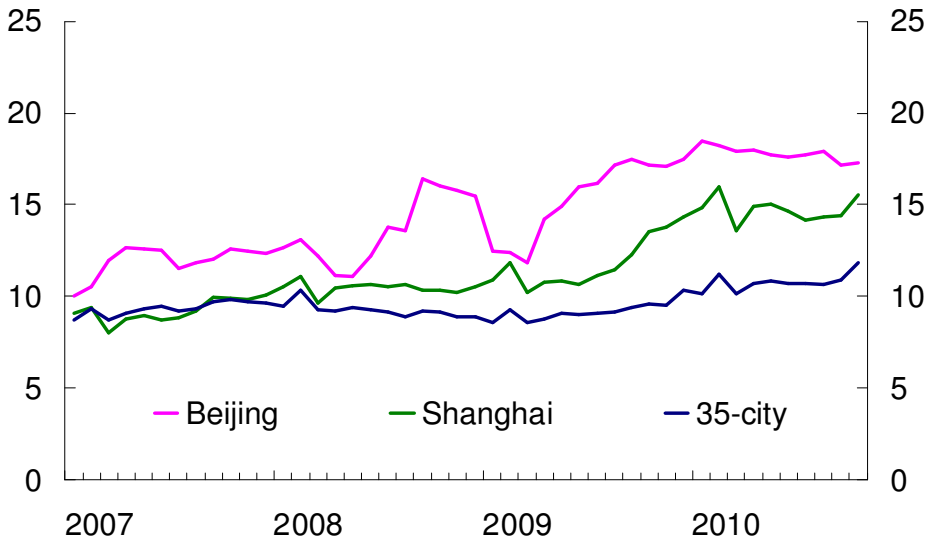




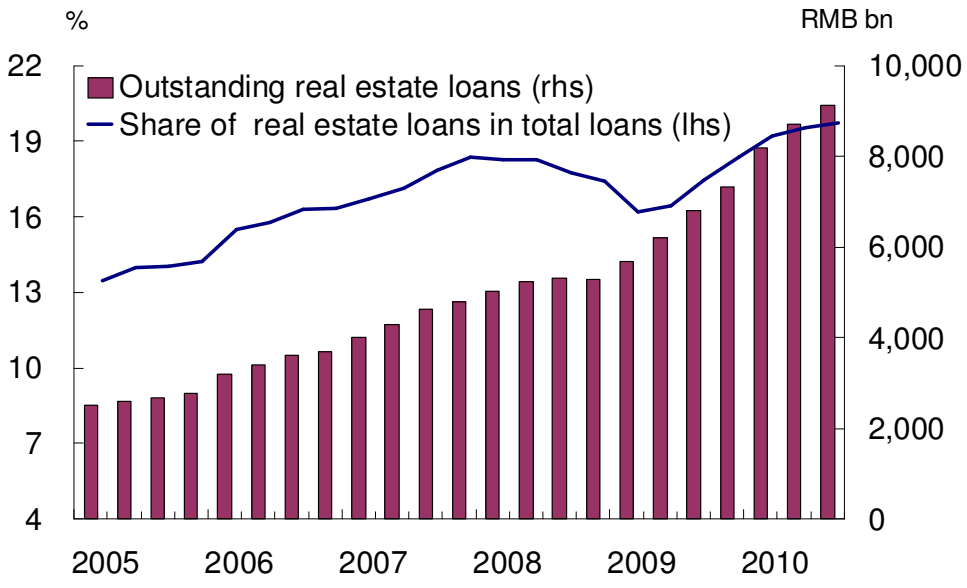
Motivation (2)

- Housing affordability worsened and real estate related loans expanded fast

Price-to-income ratio



Real estate loans



Motivation (3)

- Questions to answer
  - Are Mainland property prices rising too fast?
  - How would property price adjustments affect China's domestic economy?
  - How to reduce the risks of overheating?

Are housing prices rising too fast in China?

- Two models to evaluate Mainland property prices
  - Demand-supply model to estimate equilibrium property prices
    - Determinants from both demand and supply sides
  - Asset pricing model to estimate benchmark property prices
    - A benchmark property price is defined as the price when the rent equals the user cost of housing

Demand-supply model (1)

- Demand-supply model (reduced form)

$$P_{i,t}^{*} = c_0 + c_1 y_{i,t}^{*} + c_2 r_{i,t}^{*} + c_3 L_{i,t}^{*} + c_4 D_{i,t}^{*} + c_5 S_t^{*}$$

$$P_{i,t} = P_{i,t}^{*} + c_6 \sum_{j=-2}^{2} \Delta y_{i,t+j} + c_7 \sum_{j=-2}^{2} \Delta r_{i,t+j} + c_8 \sum_{j=-2}^{2} \Delta L_{i,t+j} + c_9 \sum_{j=-2}^{2} \Delta D_{i,t+j} + c_{10} \sum_{j=-2}^{2} \Delta S_{t+j} + \varepsilon_{it}$$

$P_{i,t}$ ($P_{i,t}^{*}$): actual (equilibrium) property price

$y_{i,t}$ ($y_{i,t}^{*}$): actual equilibrium) GDP per capita

$r_{i,t}$ ($r_{i,t}^{*}$): actual (equilibrium) lending rate

$L_{i,t}$ ($L_{i,t}^{*}$): actual (equilibrium) land price index

$D_{i,t}$ ($D_{i,t}^{*}$): actual (equilibrium) population density

S_t (S_t^{*}): actual (equilibrium) stock index

Demand-supply model (2)

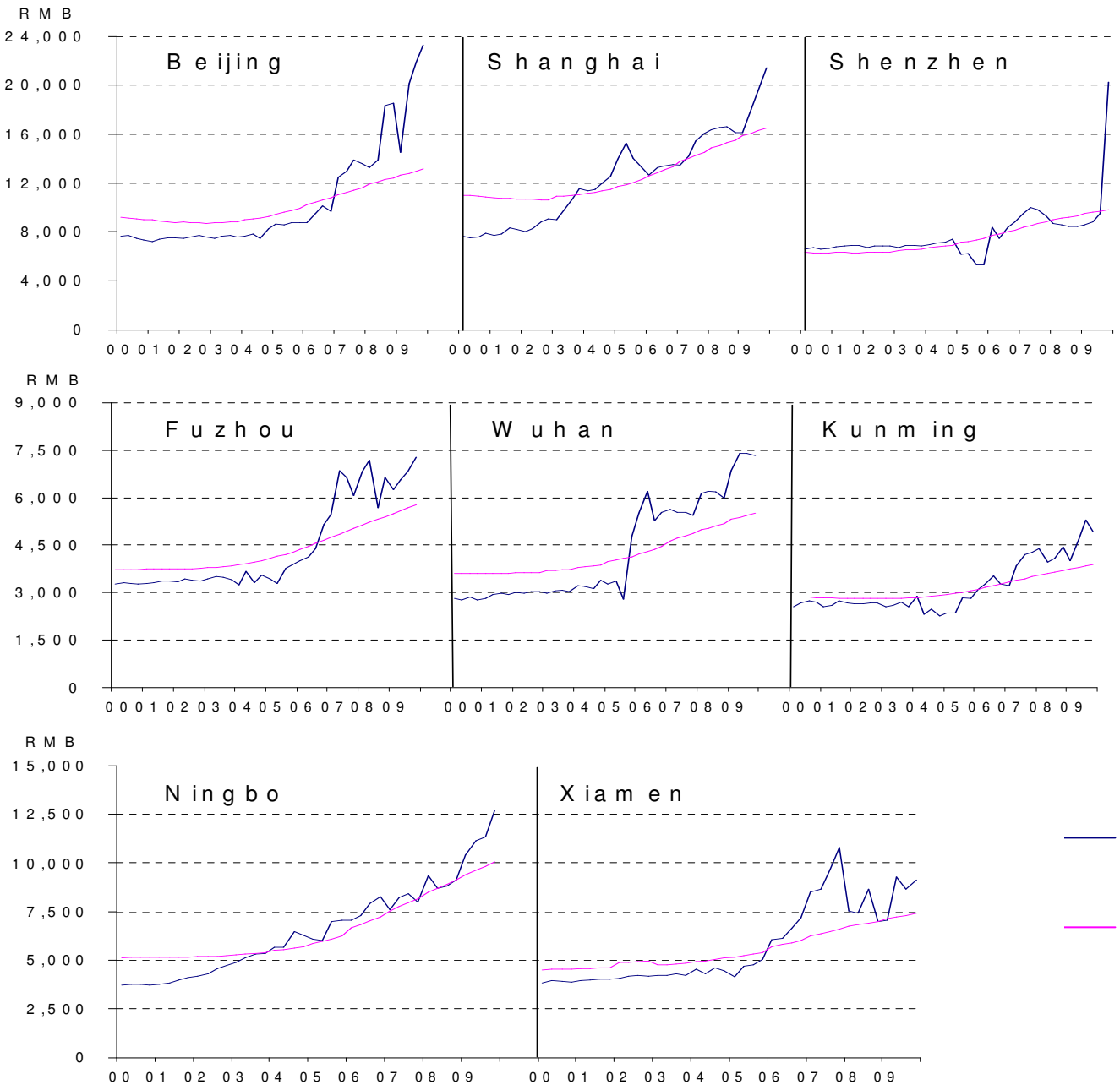
- Panel regression (2000 Q1-2009 Q4, 35 cities)

	Coefficient	t-statistic
Constant	5.291	31.461
Real interest rate	-0.020	-2.616
Real GDP per capita	0.058	2.179
Population density	0.0002	6.888
Land price	0.001	9.541
Stock price	0.302	8.976

Demand-supply model (3)

- Main findings
  - Overall, actual property prices are in line with their long-term levels
  - But property prices in a few big cities deviated from their long-term levels recently
    - Beijing, Shanghai, Shenzhen, Fuzhou, Wuhan, Kunming, Ningbo, and Xiamen

Demand-supply model (4)



Actual price

Equilibrium price

Asset pricing model (1)

Asset pricing model

$$R_t = p_t^* u_t$$

$$u_t = r_t^{rf} + \omega_t - \tau_t (r_t^m + \omega_t) + \delta_t - E_t g_{t+1} + \rho_t$$

R_t : rent

p_t^* : benchmark property price

u_t : user cost of housing

r_t^{rf} : real risk-free rate

ω_t : property tax rate

τ_t : income tax rate

r_t^m : mortgage rate

$\tau_t (r_t^m + \omega_t)$: tax deductible

δ_t : housing depreciation rate

$E_t g_{t+1}$: expected housing value appreciation

ρ_t : risk premium for owning relative to renting a house

Asset pricing model (2)

- Parameter setting

r_t^{rf} = 5-year bond rate – long-term inflation rate

$\delta_t = 2.5\%$

$\omega_t = 0.0$

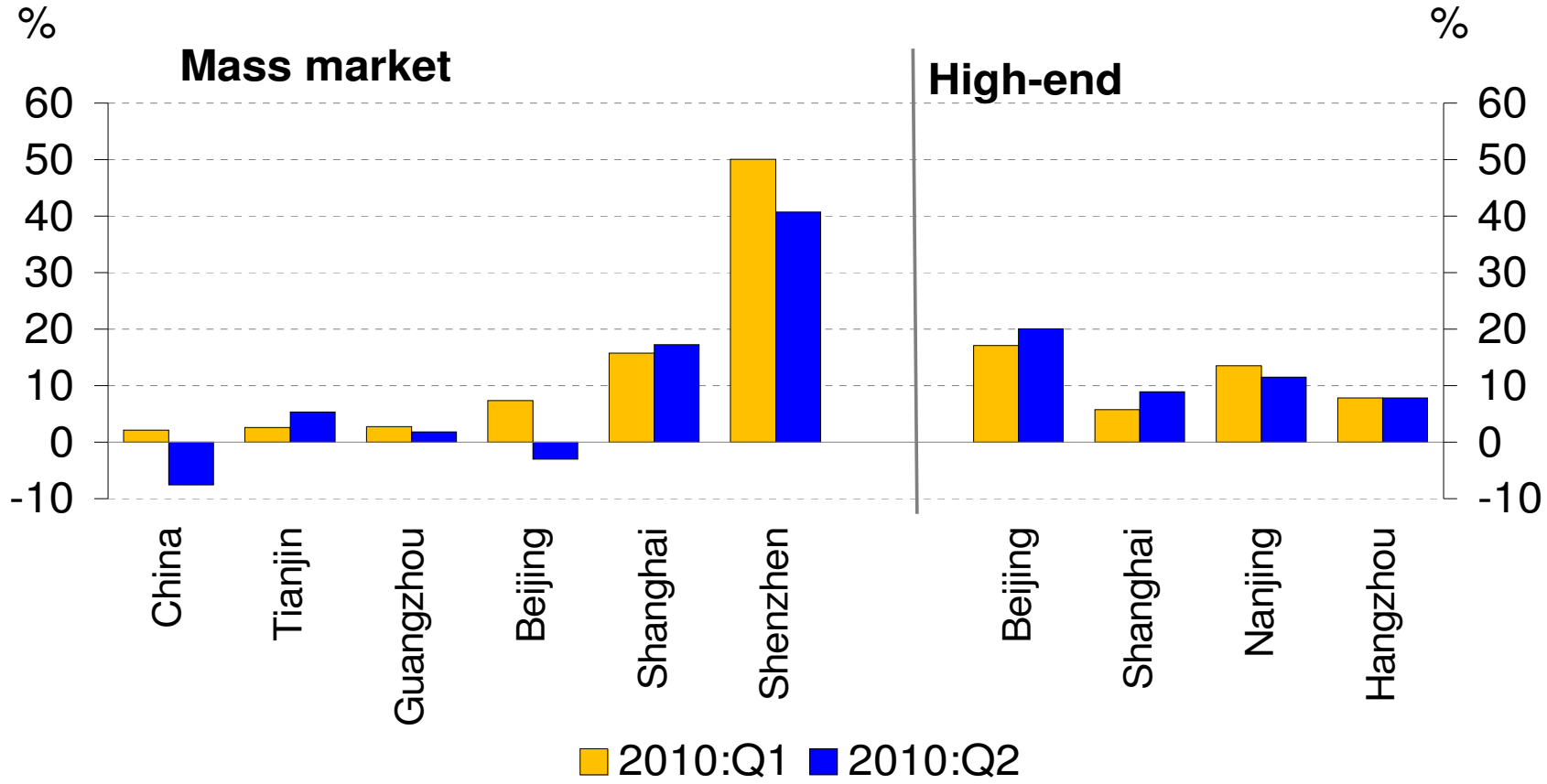
$\tau_t(r_t^m + \omega_t) = 0.0$

$E_t g_{t+1}$ = average of actual property value appreciation trend

ρ_t = backed out assuming benchmark price equals actual price in the long run

Asset pricing model (3)

Deviations of actual prices from benchmark prices in percent



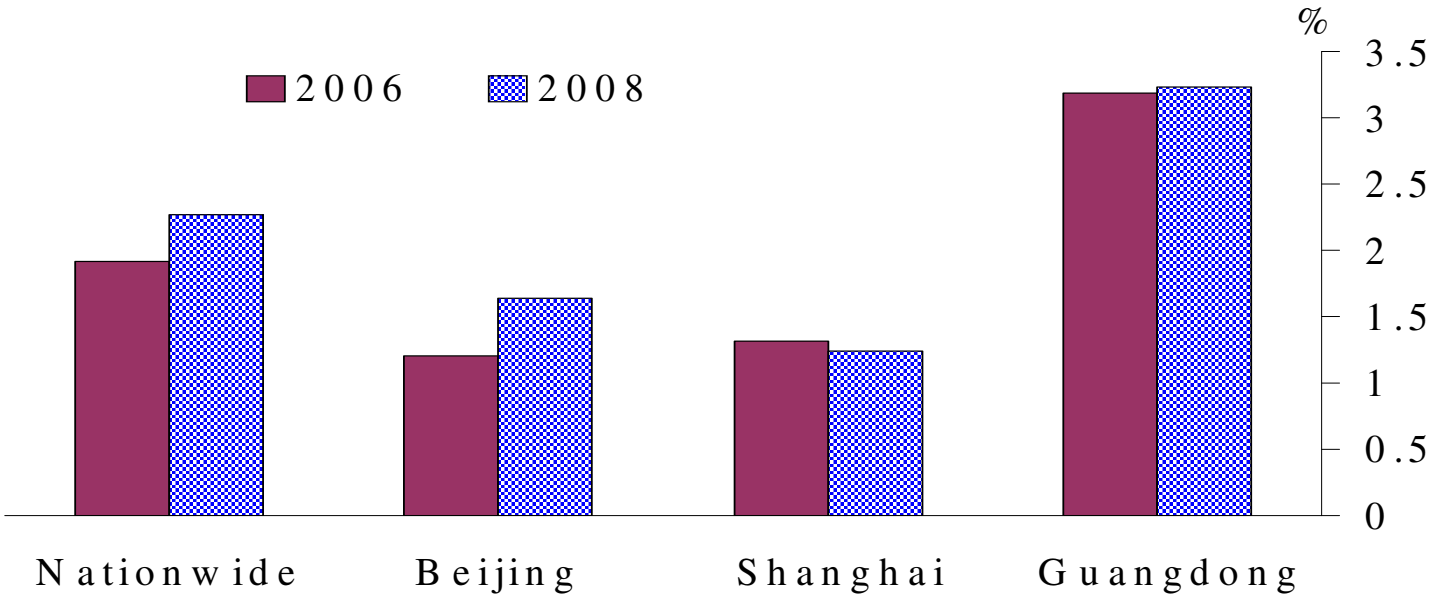
Major findings and implications

- For China as a whole, house prices do not appear to be significantly higher than justified by fundamentals
- But signs of overheating have emerged in some cities
- Major economic fundamentals would remain supportive of property prices in the medium term
- Policy measures could play a role in preventing an overheating in the property market

Property market and domestic demand (1)

- Property market and consumption
  - Three channels
    - Wealth effect

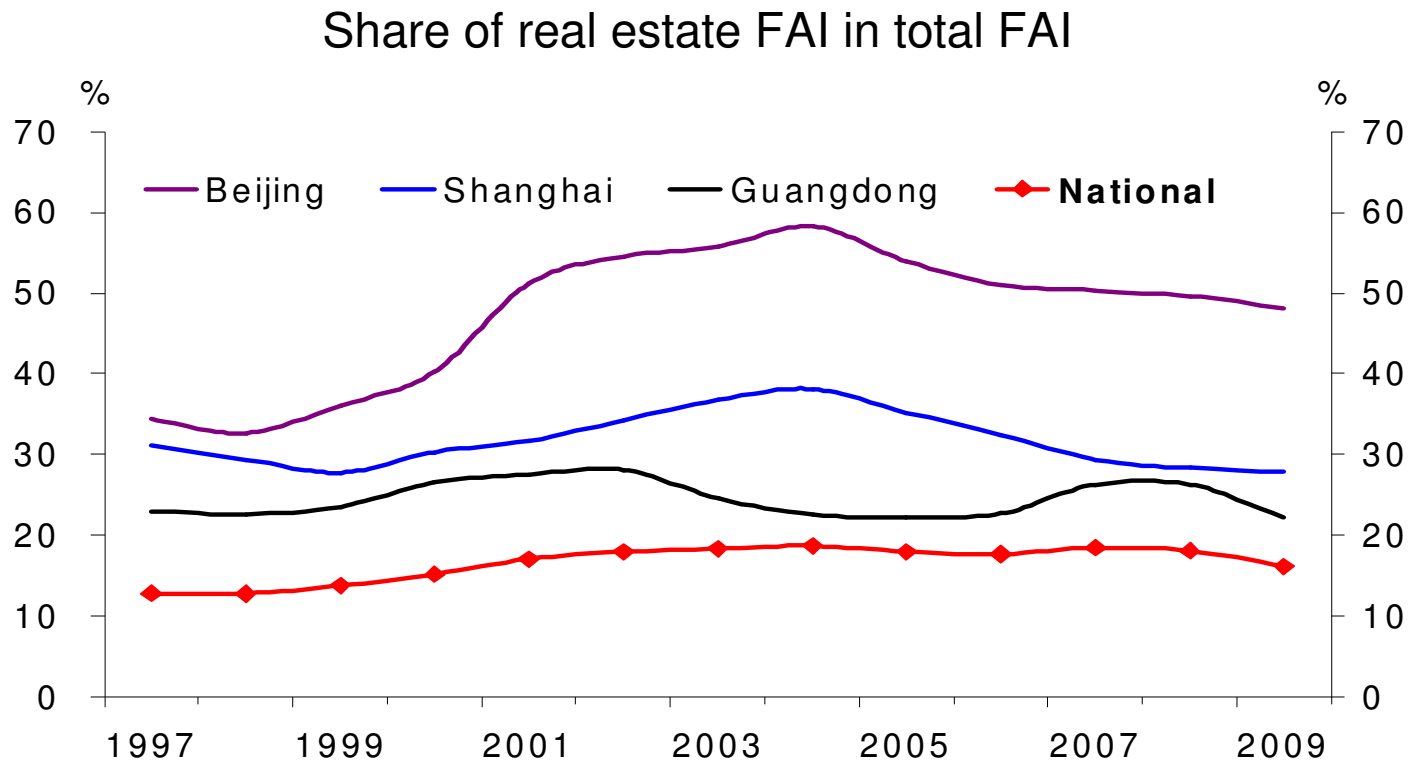
Share of property income in urban per capita income



    - Property price adjustment can affect investment and output, and hence income expectations
    - Property price adjustment can affect household financing ability (not a significant channel in Asia)

Property market and domestic demand (2)

- Property market and investment
  - Direct impact



  - Indirect impact: property price adjustments can also affect upstream sectors' investment

Property market and domestic demand (3)

- Effect of property price changes on consumption and investment

$$\Delta C_{i,t} = \alpha_0 + \alpha_1 \Delta Y_{i,t-1} + \alpha_2 \Delta P_{i,t} + \alpha_3 rd_t$$

$$\Delta I_{i,t} = \beta_0 + \beta_1 \Delta Y_{i,t-1} + \beta_2 \Delta P_{i,t} + \beta_3 UC_{i,t}$$

$\Delta C_{i,t}$: real private consumption growth

$\Delta I_{i,t}$: growth of real gross capital formation

$\Delta Y_{i,t}$: real GDP growth

rd_t : one-year deposit rate

$\Delta P_{i,t}$: property price growth

$UC_{i,t}$: user cost of capital

Property market and domestic demand (4)

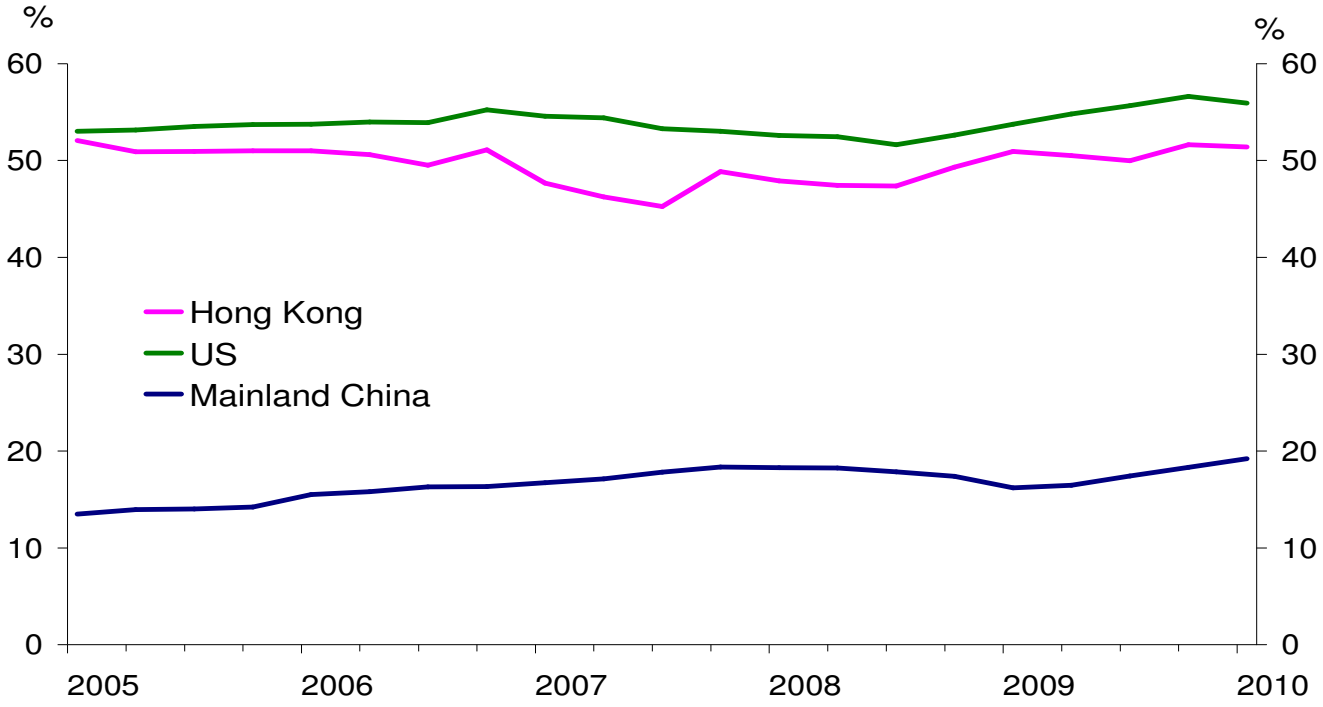
- Effect of property price changes on consumption and investment

	Variable	Estimate	T-statistic
Consumption Function	Real GDP growth	0.519	3.66
	Property price growth	**0.07**	**1.318**
	One-year deposit rate	-0.304	-2.451
	R^2		0.207
Investment Function	Real GDP growth	1.371	8.585
	Property price growth	**0.441**	**5.045**
	User cost of capital	-0.64	-5.171
	R^2		0.47
Sample: consumption function (344), investment function (327), annual provincial data: 1994-2008			

Property market and banking sector (1)

- Banking sector's direct exposure to the property market is manageable

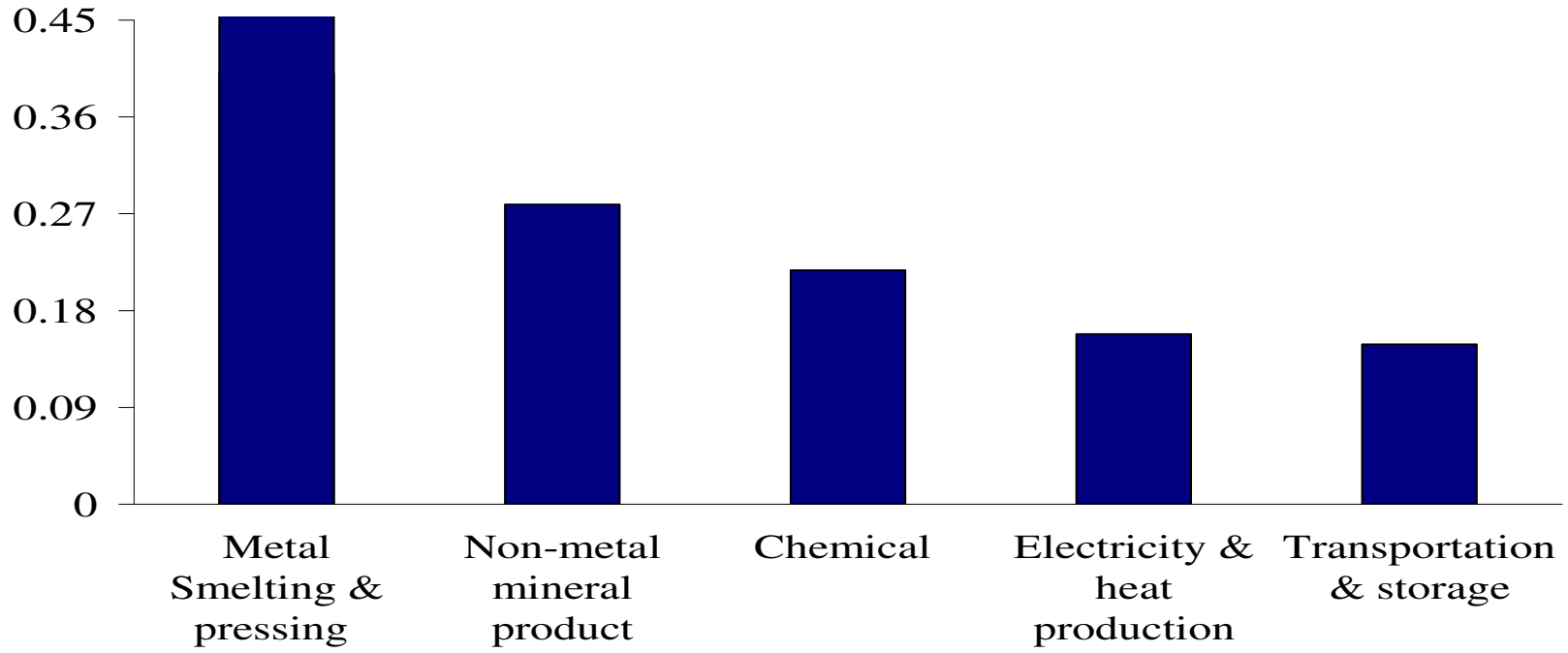
Banking sector's direct exposure to the property market



Property market and banking sector (2)

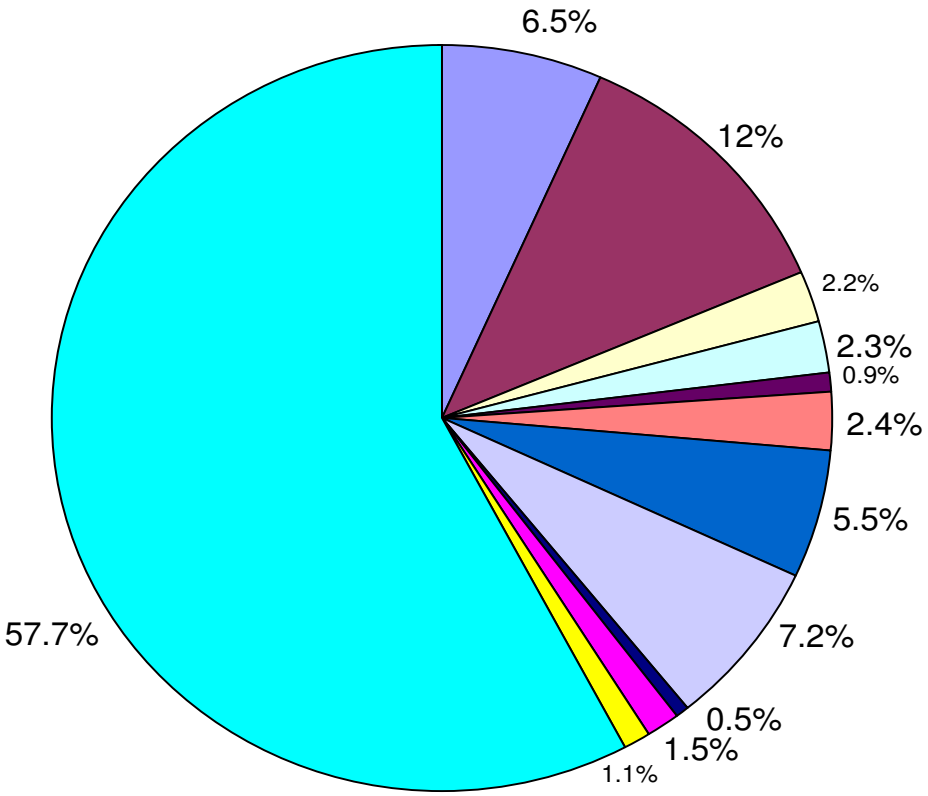
- Banking sector's indirect exposure
  - Property market is closely linked to other sectors
  - These sectors in turn are closely linked to the banking sector

Cumulative input coefficients of the construction sector



Property market and banking sector (3)

Distribution of Outstanding Loans in 2009



Direct: 18.5%

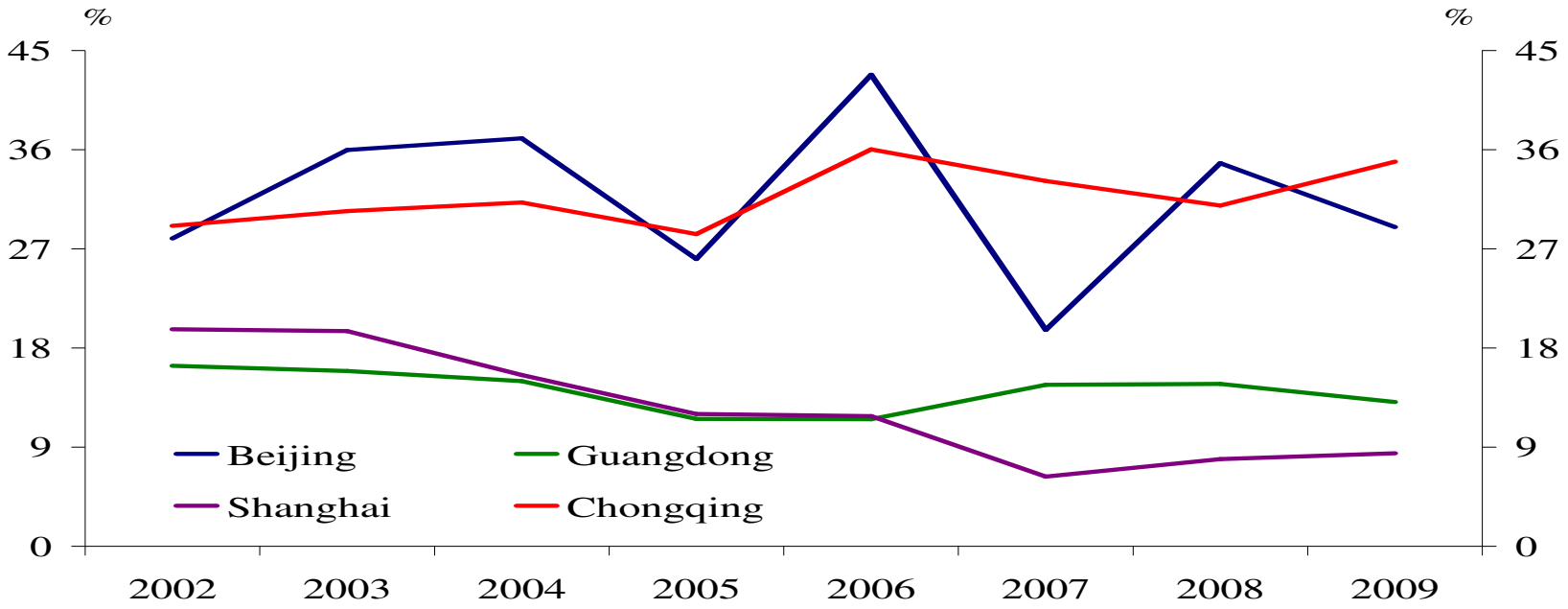
Indirect: 23.8%

- Real estate developer
- Housing mortgage
- Construction
- Smelting & pressing of metals
- Non-metal mineral product
- Chemical sector
- Electricity & heat production
- Transport & storage
- Petroleum processing, coking & nuclear fuel
- Universal & special purpose equipment
- Electric machinery & equipment
- Others

Property market and government revenues

- Two channels
  - Property market affects investment and consumption, which in turn affect relevant tax revenues.
  - Property prices affect land prices, which in turn affect government land sale revenue.

Ratio of land sales to local government's budgetary revenues



Conclusion

- Although property prices do not appear to be significantly overvalued in China as a whole, there are signs of overheating in the property markets of a few big cities
- Property market corrections may not exert a large impact on consumption, but could affect investment and government revenues significantly
- Banking sector's direct exposure is manageable, but its total exposure could be sizable
- Policy measures could help reduce overheating risks