

Deficit Spending, Infrastructure Financing and Effects on Local Fiscal Structure: Evidence from China

Joyce Yanyun Man

PKU-Lincoln Center, Peking University

Lincoln Institute of Land Policy

May 20-21, 2010

UI-Lincoln Conference

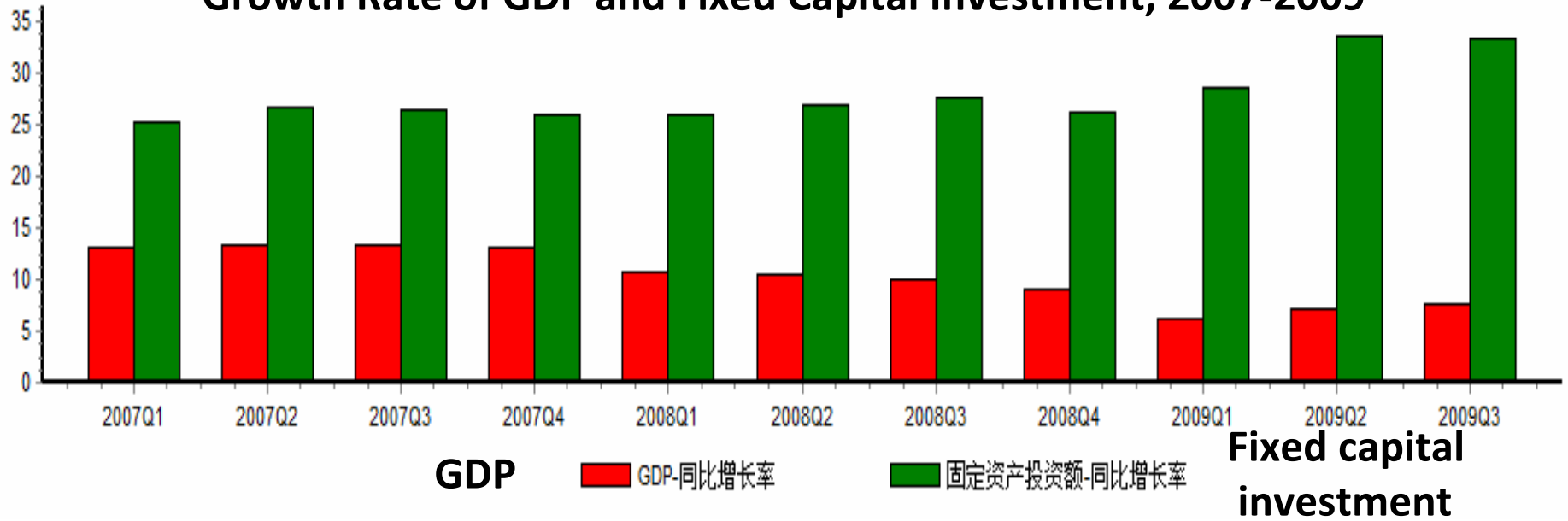
Research Questions

1. What is the impact of financial crisis on Fiscal Structure of Local Governments in China?
2. What is the relationship between deficit spending and use of leasing fees from land in China?
3. Why are the uses of the land transfer fees vary across cities?
4. Are the differences in quantity of land supply and leasing fees correlated with differential economic performance among Chinese cities?

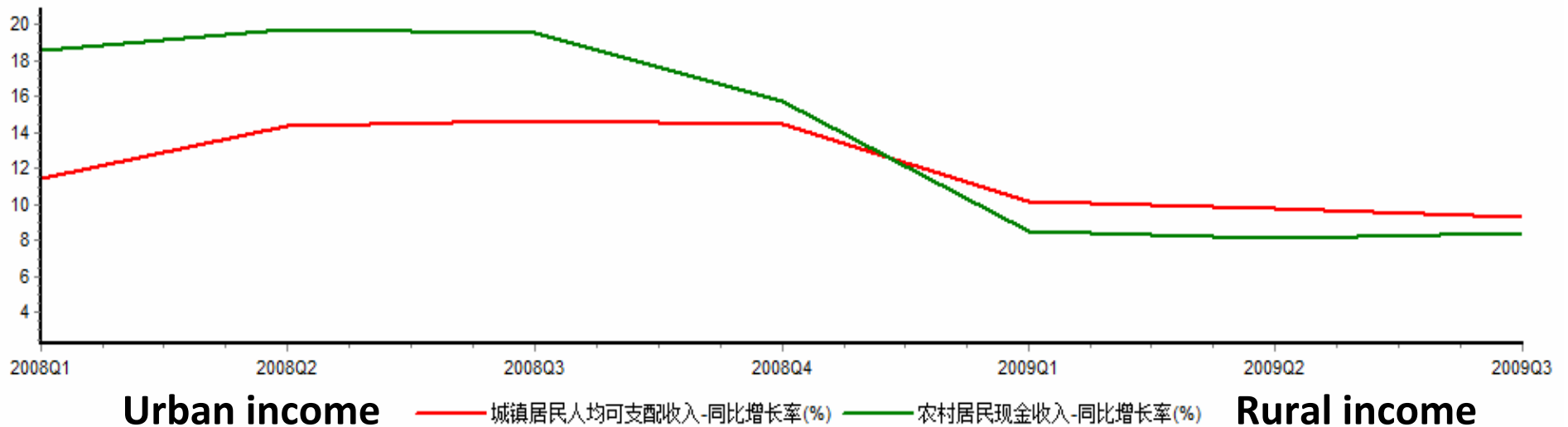
GDP与固定资产投资同比增长率(单位:%)

2007年一季-2009年三季

Growth Rate of GDP and Fixed Capital Investment, 2007-2009

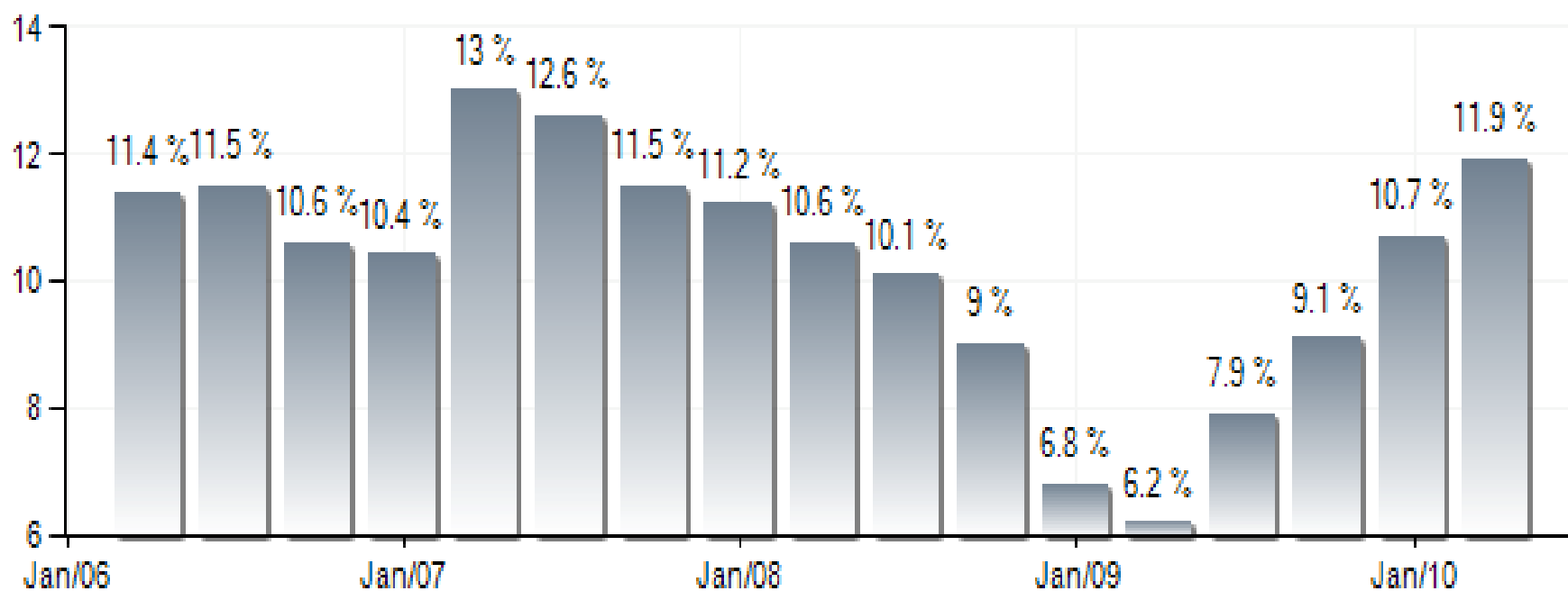


- However, the average income is decreasing, 2008Q1-2009Q3



China GDP Growth Rate

— Annual GDP Growth Adjusted by Inflation

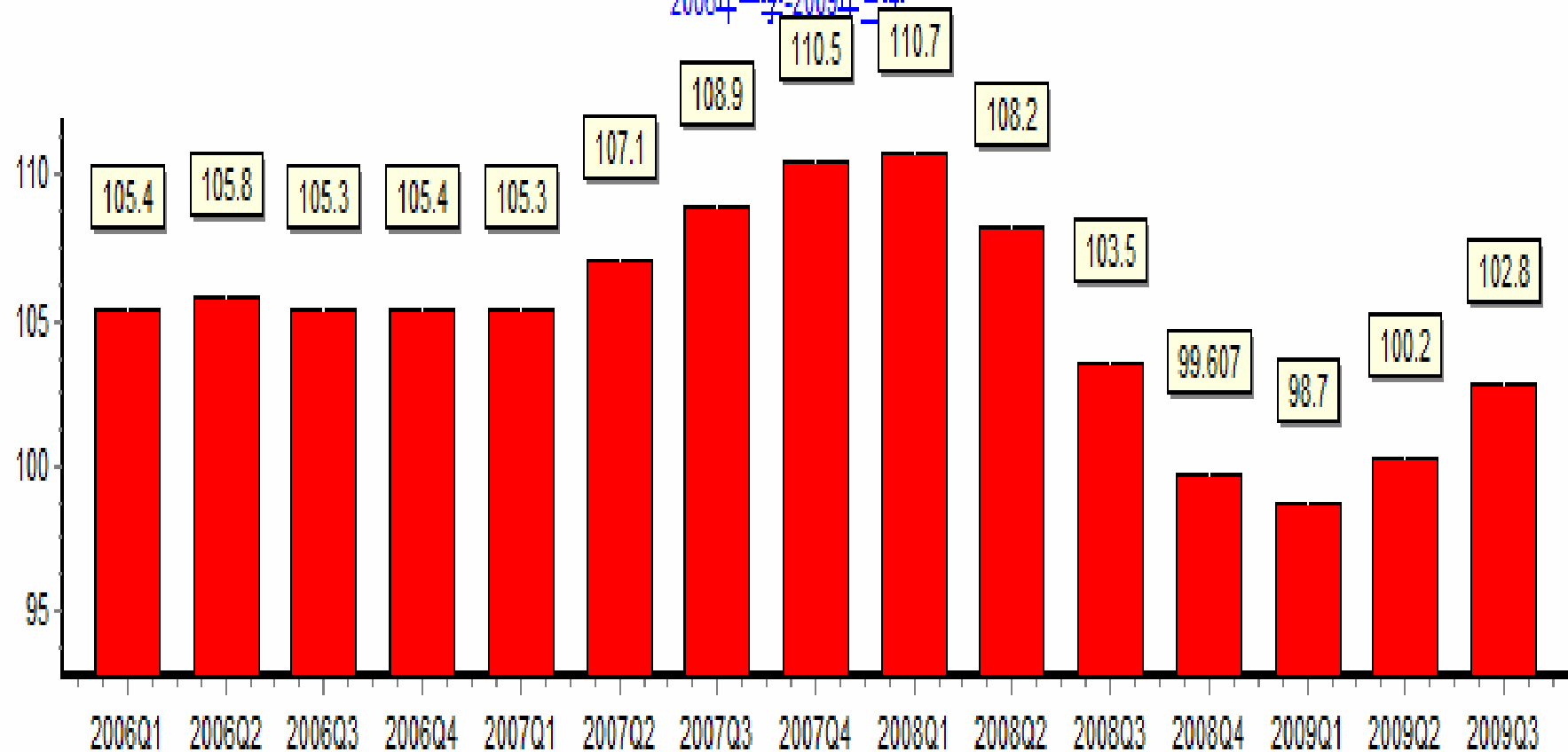


source: National Bureau of Statistics

Housing Sales Price Index, 2006Q1-2009Q3

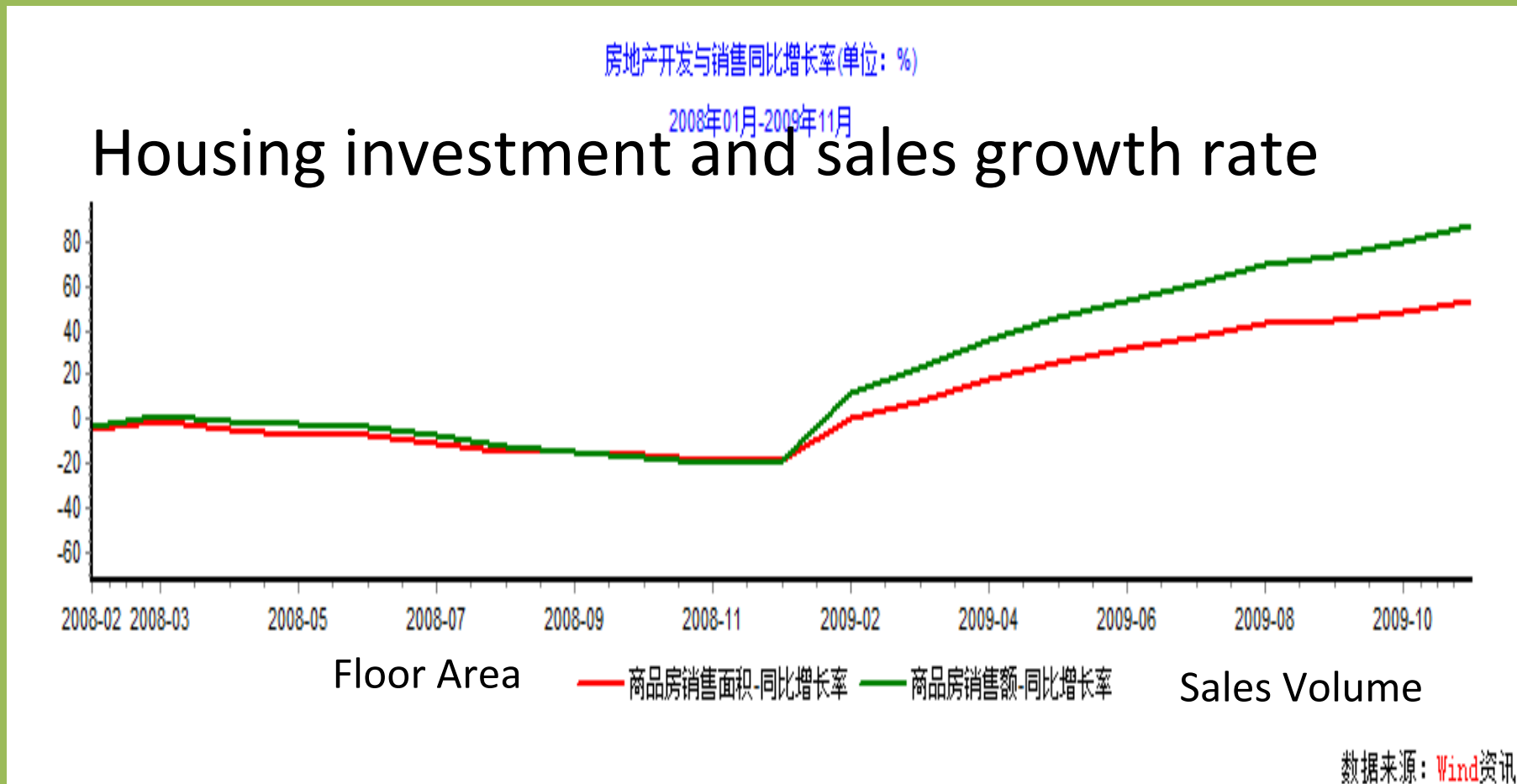
全国房地产销售价格指数(单位: %)

2006年一季-2009年三季

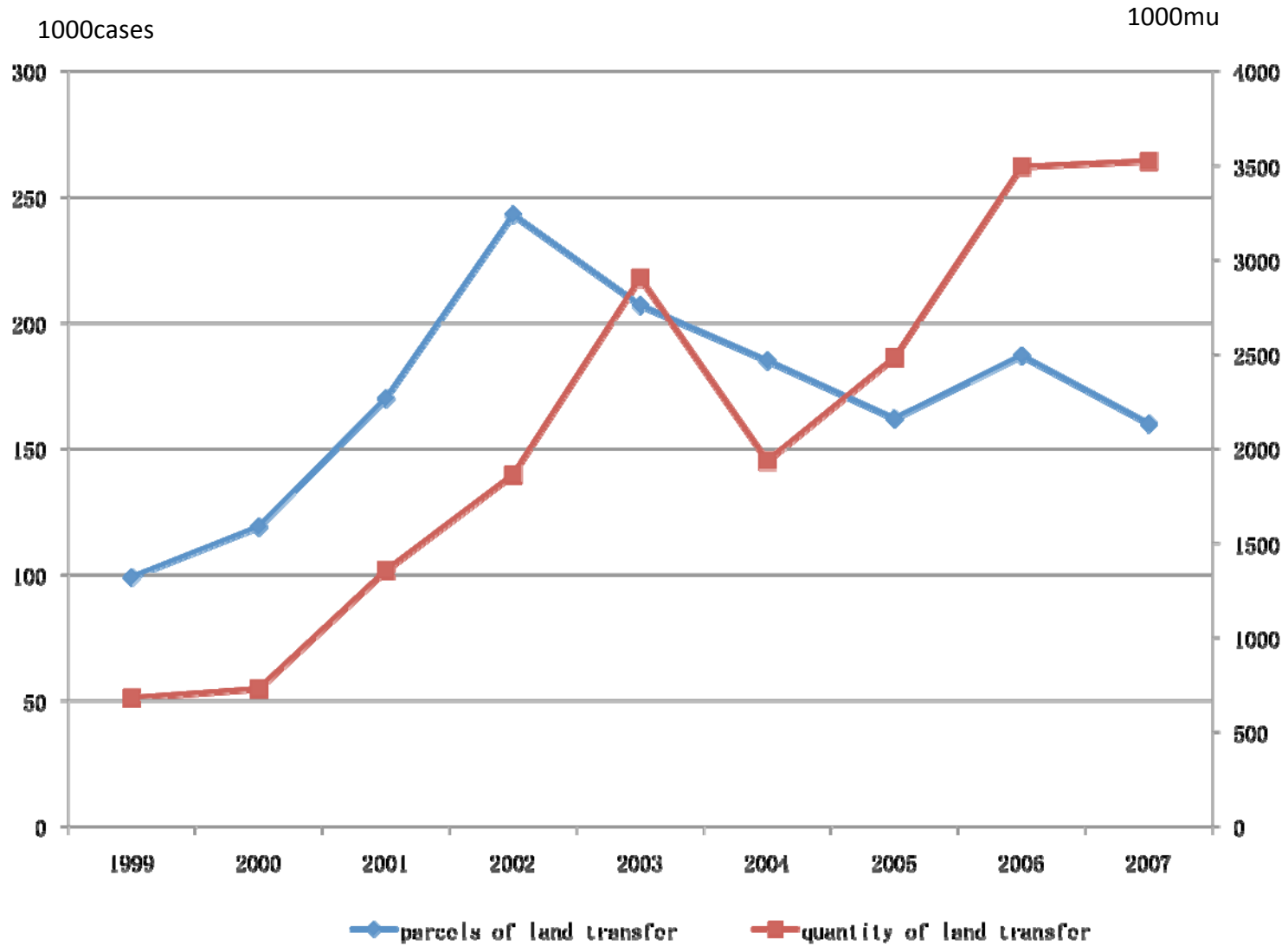


■ 全国房地产销售价格指数-总计

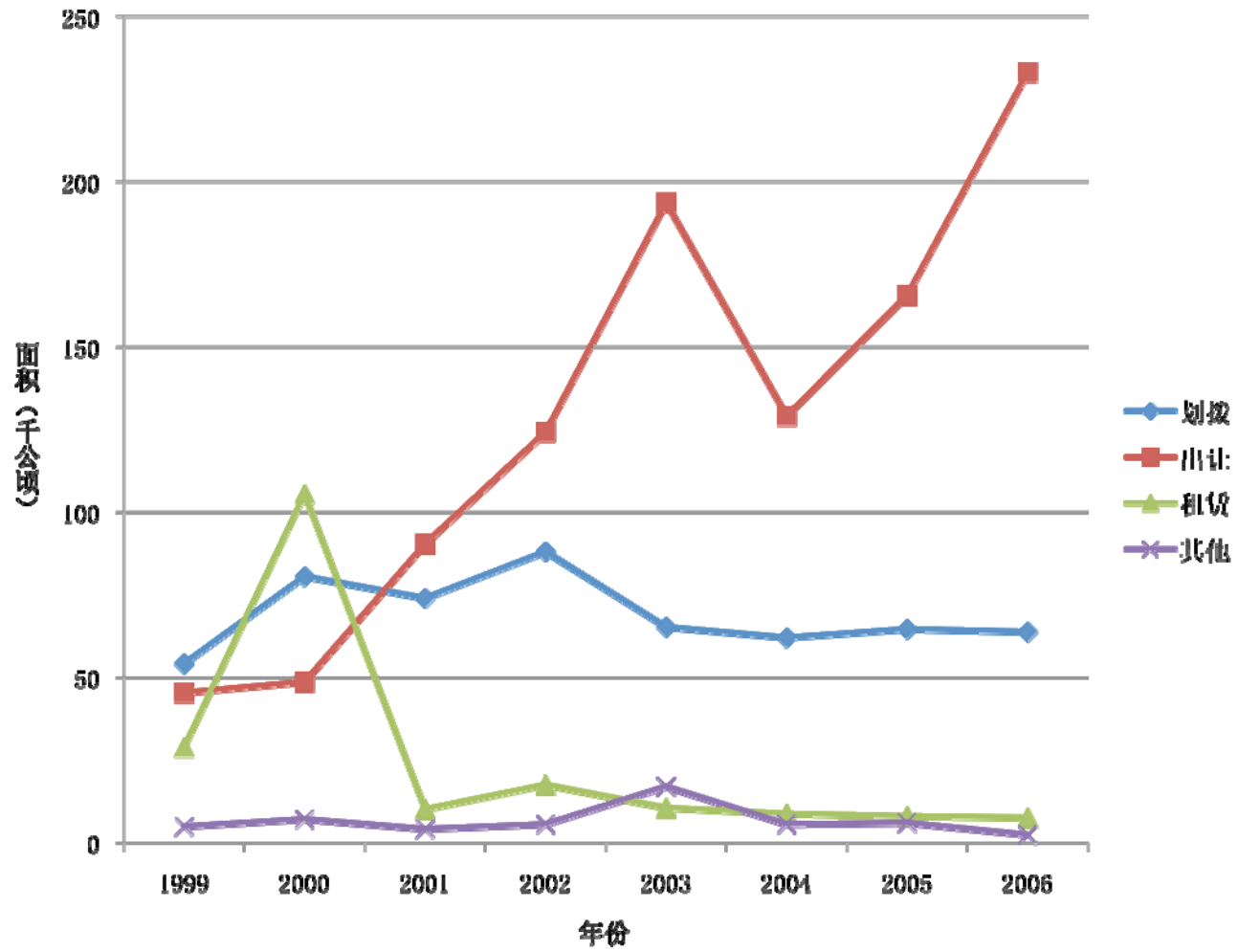
- Housing Price grew by 25% on average in 2009.
- Prices for commercially built new residential units in Beijing have jumped above **50%** so far this year, outpacing the growth of sales volume by more than **2.5** times.



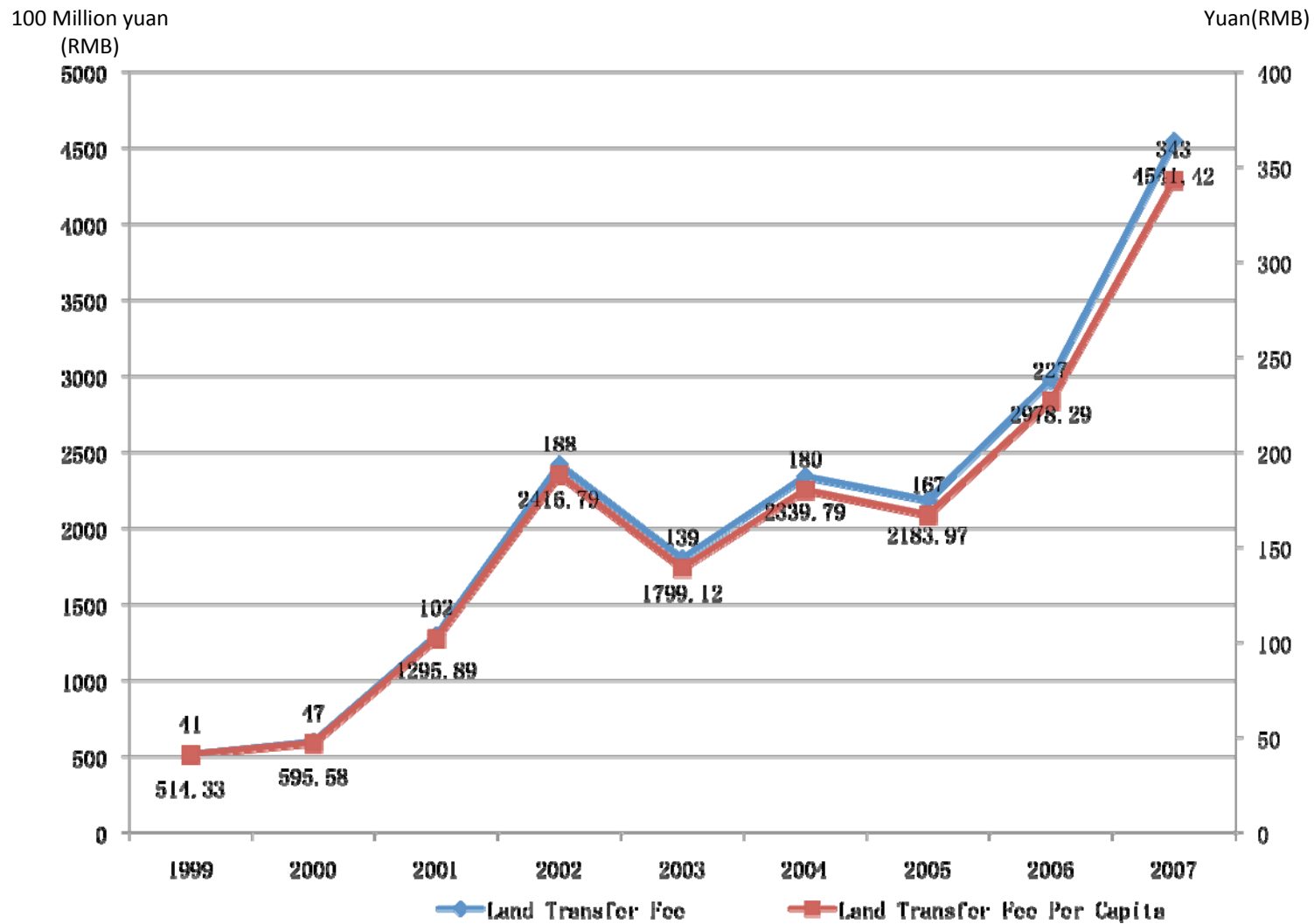
Quantity of Land Supply and Land Parcels Transferred, 1999-2007



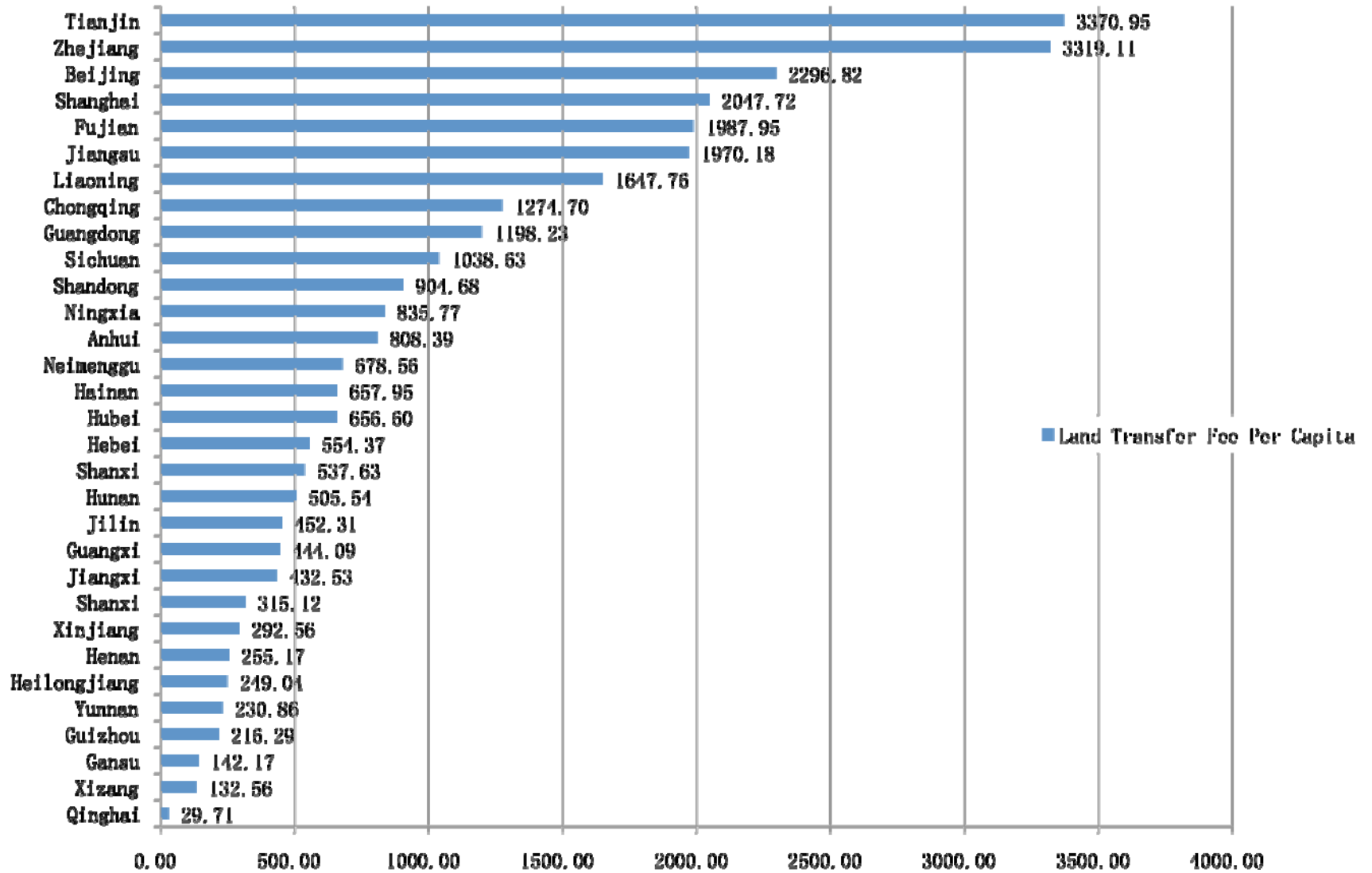
Trends of Quantity of Land Supply



Revenues from Land Transfer Fees, 1999-2007



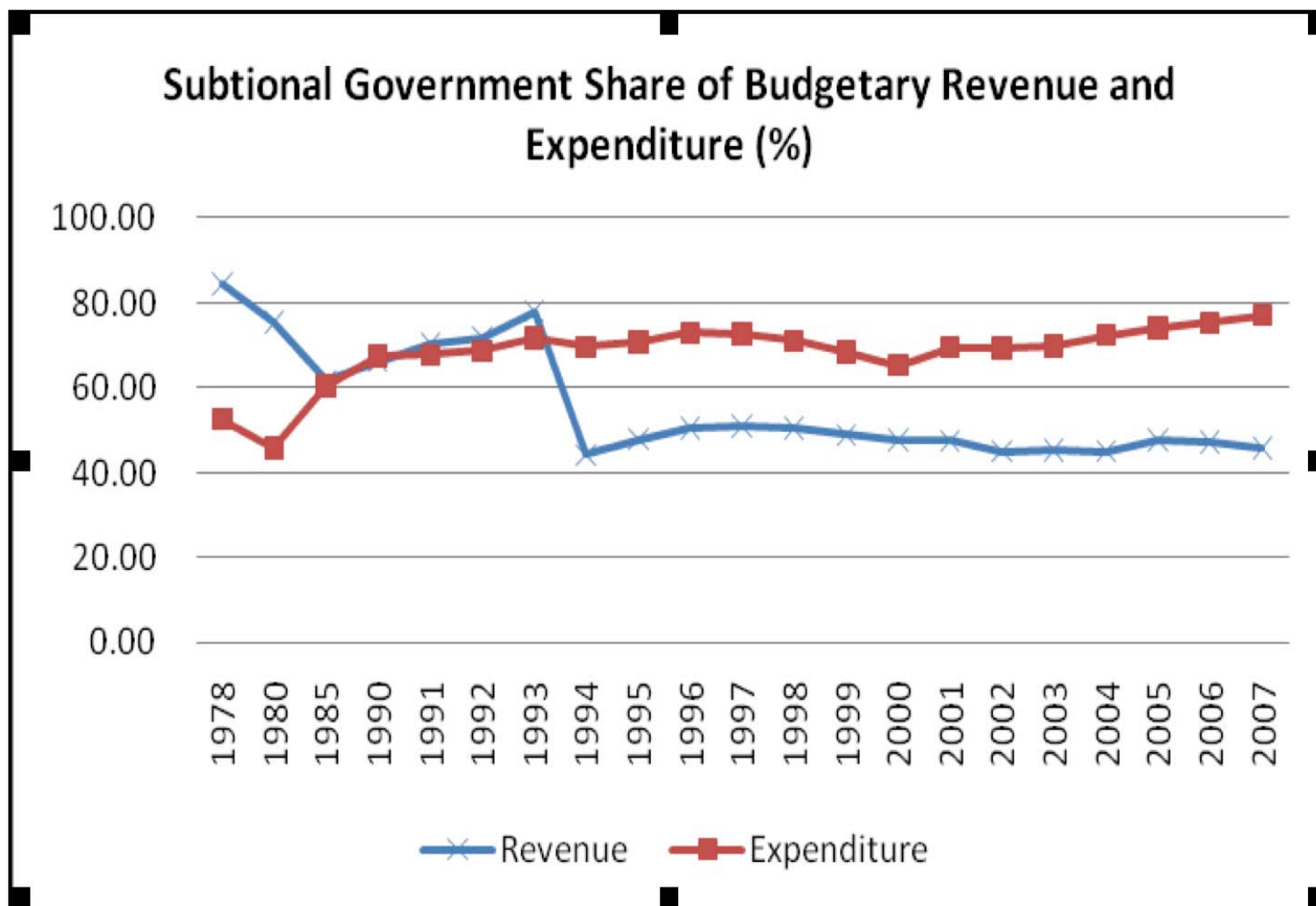
Per Capita Land Transfer Fees by Province



Rank	Province	quantity ofLand Transfer (mu)	Province	Land Transfer Fee (10000yuan)	Province	Land Transfer Fee Per Capita (yuan/person)
1	Jiangsu	388774.95	Shandong	4021108	Beijing	1199.9
2	Shandong	365698.05	Sichuan	2991261	Tianjin	648.3
3	Liaoning	320006.7	Jiangsu	2194563	Shanghai	626.1
4	Zhejiang	278826.15	Liaoning	1993551	Fujian	494.0
5	Guangdong	216904.05	Zhejiang	1990415	Liaoning	467.5
6	Anhui	199941.3	Beijing	1896979	Shandong	432.6
7	Fujian	166505.4	Fujian	1757633	Zhejiang	399.7
8	Hebei	139090.05	Anhui	1274983	Chongqing	391.4
9	Sichuan	132665.55	Henan	1263269	Sichuan	366.9
10	Hubei	117463.8	Shanghai	1136339	Jiangsu	293.3
11	Shanghai	115201.95	Chongqing	1083457	Anhui	213.8
12	Henan	105702.75	Guangdong	1068770	Hainan	198.1
13	Xinjiang	95930.55	Hubei	962625.1	Jilin	193.1
14	Jiangxi	89280.75	Hebei	951760.8	Xizang	185.4
15	Chongqing	89264.25	Jiangxi	752345.5	Hubei	176.0
16	Hunan	87604.65	Tianjin	687037.9	Jiangxi	173.4
17	Jilin	73185.3	Hunan	535515.8	Ningxia	147.4
18	Guangxi	71882.7	Heilongjiang	534026.4	Hebei	142.2
19	Tianjin	58006.05	Jilin	514979.8	Heilongjiang	140.3
20	Yunnan	57237.15	Guangxi	392047.8	Henan	134.7
21	Heilongjiang	53923.05	Shan(山)xi	264867.7	Xinjiang	125.7
22	Neimenggu	47166.15	Xinjiang	257533.9	Guangdong	115.1
23	Shan(山)xi	38174.25	Shan(陕)xi	246383.2	Neimenggu	105.5
24	Beijing	37732.65	Guizhou	238728.9	Guangxi	90.4
25	Gansu	37078.2	Neimenggu	203493.3	Hunan	86.0
26	Shan(陕)xi	35312.4	Hainan	165587.9	Shan(山)xi	83.1
27	Ningxia	24565.2	Yunnan	156962.5	Shan(陕)xi	66.8
28	Guizhou	23196	Ningxia	89008.5	Guizhou	66.8
29	Hainan	14708.7	Gansu	85055.02	Qinghai	37.5
30	Qinghai	10373.4	Xizang	52090.83	Yunnan	37.5
31	Xizang	3866.1	Qinghai	20515.1	Gansu	32.7

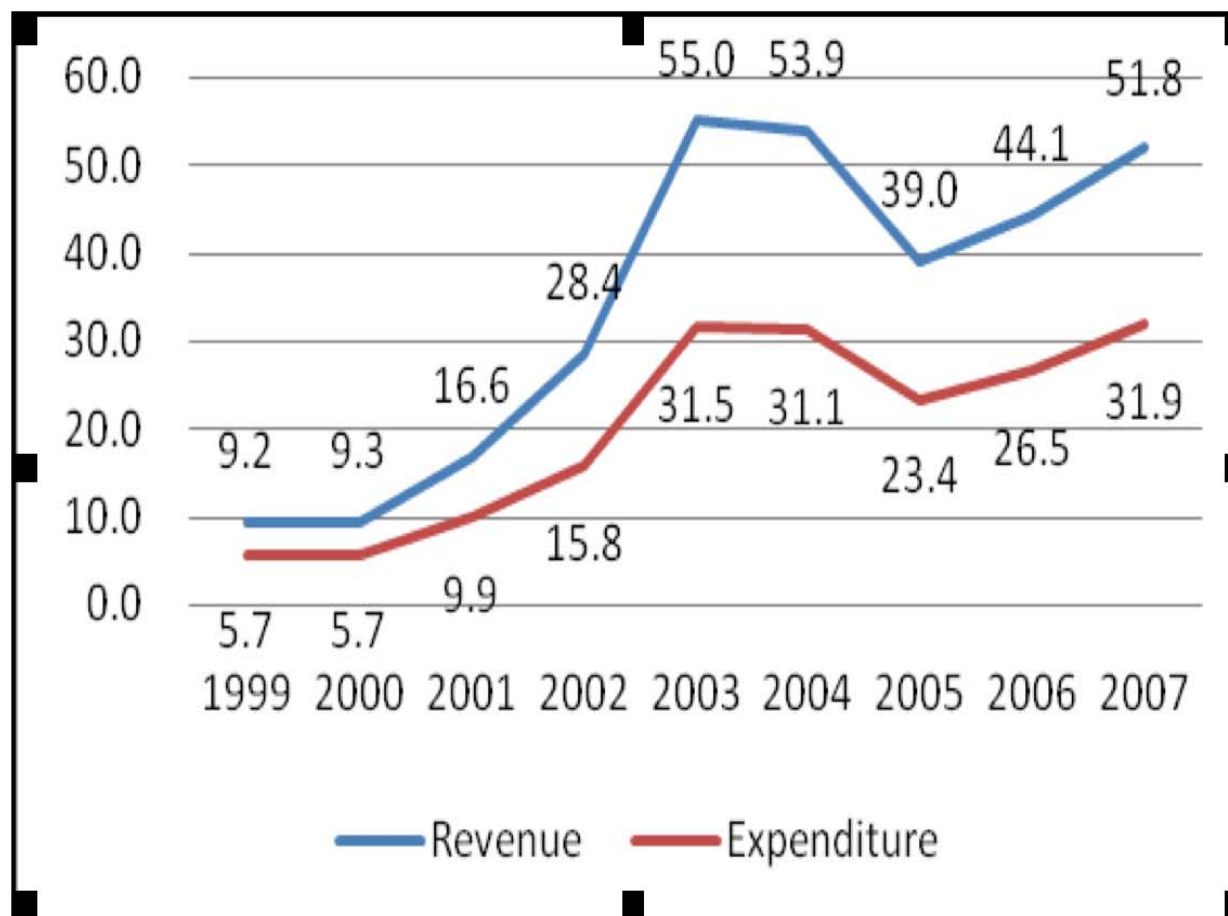
Rank	Province	% of Land Transfer Fee in GDP,Province	Province	% of Land Tansfer Fee in Local Revenue,Province	Province	% of Land Tansfer Fee in Local Expenditure
1	Sichuan	3.47	Sichuan	49.3	Fujian	24.10
2	Chongqing	3.15	Xizang	35.8	Sichuan	22.20
3	Beijing	2.41	Chongqing	34.6	Shandong	22.00
4	Fujian	2.31	Fujian	32.5	Chongqing	18.50
5	Liaoning	2.16	Anhui	30.5	Beijing	14.60
6	Anhui	2.12	Shandong	29.7	Liaoning	14.00
7	Shandong	1.82	Jiangxi	24.6	Anhui	13.90
8	Xizang	1.79	Liaoning	24.4	Zhejiang	13.50
9	Jiangxi	1.61	Jilin	21.4	Tianjin	12.80
10	Tianjin	1.60	Hubei	21.1	Jiangsu	11.00
11	Hainan	1.57	Hainan	20.2	Jiangxi	10.80
12	Hubei	1.32	Henan	18.6	Hubei	9.60
13	Zhejiang	1.26	Beijing	17.0	Hainan	9.50
14	Ningxia	1.25	Tianjin	16.7	Henan	8.80
15	Jilin	1.23	Hebei	15.8	Hebei	8.30
16	Guizhou	1.10	Zhejiang	15.3	Jilin	7.30
17	Shanghai	1.10	Ningxia	14.5	Shanghai	6.30
18	Jiangsu	1.02	Heilongjiang	13.9	Guangzhou	5.80
19	Henan	1.01	Jiangsu	13.4	Heilongjiang	5.50
20	Guangzhou	0.88	Guangxi	12.5	Hunan	5.10
21	Heilongjiang	0.87	Xinjiang	11.7	Ningxia	4.60
22	Xinjiang	0.85	Hunan	11.4	Guangdong	4.20
23	Hebei	0.84	Guizhou	11.1	Guizhou	4.10
24	Hunan	0.72	Neimenggu	7.4	Xinjiang	3.80
25	Shanxi (山)	0.59	Shanghai	7.2	Shanxi (山)	3.10
26	Shanxi (陕)	0.55	Shanxi (陕)	6.9	Neimenggu	3.10
27	Neimenggu	0.53	Gansu	6.0	Shanxi (陕)	3.00
28	Yunnan	0.42	Qinghai	4.9	Xizang	2.60
29	Guangdong	0.41	Guangdong	4.9	Yunnan	1.90
30	Gansu	0.37	Shanxi (山)	4.8	Gansu	1.60
31	Qinghai	0.32	Yunnan	4.4	Qinghai	1.00

Figure 1.1 Subnational Government Share of Budgetary Revenue and Expenditure in China: 1978-2007



Source: National Statistic Bureau, 2008

Ratio of Land Transfer Fees (gross) and Fiscal Revenue and Expenditure, 1999-2007



Source: National Bureau of Statistics, 2008

Empirical Estimation Model

$$FSLG_{it} = \alpha_{it} + \beta X_{it} + \varepsilon_{it} \quad (1)$$

where, $i = 1, 2, 3, \dots, N$, $t = 1, 2, 3, \dots, T$; α_{it} is constant that varies across time and locations (cities or provinces). X_{it} is a $1 \times k$ vector of explanatory variables and ε_{it} is error term. β is a $k \times 1$ vector of coefficients.

$$\log(LTF_{it}) = \alpha_{it} + \beta_1 * \log(Deficit_{it}) + \beta_2 * \log(GDP_{it}) + \beta_3 * \log(POP_{it}) + \beta_4 * URBAN_{it} + \beta_5 * EMPLOYR_{it} + \beta_6 * RES_{it} + \beta_7 * IndustryS_{it} + \varepsilon_{it}$$

$$\log(LTFpc_{it}) = \alpha_{it} + \beta_1 * \log(Deficitpc_{it}) + \beta_2 * \log(GDPpc_{it}) + \beta_4 * URBAN_{it} + \beta_5 * EMPLOYR_{it} + \beta_6 * RES_{it} + \beta_7 * IndustryS_{it} + \varepsilon_{it}$$

$$\log(LTFR_{it}) = \alpha_{it} + \beta_1 * \log(Deficitpc_{it}) + \beta_2 * \log(GDPpc_{it}) + \beta_4 * URBAN_{it} + \beta_5 * EMPLOYR_{it} + \beta_6 * RES_{it} + \beta_7 * IndustryS_{it} + \varepsilon_{it}$$

Table 1. Variables Summary

	<i>Variable</i>	<i>Mean</i>	<i>Expected Sign</i>	<i>Source</i>
LTF	Land transfer fee (million Yuan)	335.59		
LTFR	Land transfer fee/Local budgetary revenue (%)	7.5		China Land and Resources Statistical Yearbook
LTFpc	Land transfer fee per capita (Yuan)	156.7		
Deficit	The gap between local budgetary expenditure and revenue (billion Yuan)	2.68	+	China Statistical Yearbook for Regional Economy
Deficitpc	Deficit per capita	765.4		
GDP	Gross domestic products (billion Yuan)	67.26	+	China Statistical Yearbook for Regional Economy
GDPpc	GDP per capita (Yuan)	17963.57		
POP	Population (million)	40.69	-	China Statistical Yearbook
URBAN	Urbanization rate (%)	33.27	-	China Statistical Yearbook
EMPLOYR	ratio of employment to local population(%)	11.28	-	China Statistical Yearbook
RES	The share of residential sector in total fixed asset investment (%)	13.35	+	China Statistical Yearbook for Regional Economy
IndustryS	The percent of industrial sector in GDP (%)	47.56	-	China Statistical Yearbook

Table 2. Estimation Results of Determinants of Fiscal Structure of Local Governments in China

Variable	Model 1 (Fixed Effect)			Model 2 (Random Effect)		
	<i>LTF</i>	<i>LTFpc</i>	<i>LTFR</i>	<i>LTF</i>	<i>LTFpc</i>	<i>LTFR</i>
<i>Deficit</i>	0.399** (0.068)			0.391** (0.067)		
<i>Deficitpc</i>		0.425** (0.065)	0.405** (0.065)		0.415** (0.064)	0.398** (0.0642)
<i>GDP</i>	1.416** (0.086)			1.414** (0.085)		
<i>GDPpc</i>		1.444** (0.083)	0.294** (0.083)		1.441** (0.0818)	0.29** (0.0819)
<i>POP</i>	-0.921** (0.111)			-0.908** (0.111)		
<i>URBAN</i>	-0.175 (0.321)	-0.151 (0.321)	-0.375 (0.321)	-0.281 (0.317)	-0.256 (0.316)	-0.44 (0.317)
<i>EMPLOYR</i>	-1.963** (0.606)	-1.901** (0.604)	-2.13** (0.605)	-2.048** (0.602)	-1.983** (0.56)	-2.19** (0.6)
<i>RES</i>	2.407** (0.568)	2.257** (0.554)	1.307** (0.555)	2.668** (0.554)	2.529** (0.541)	1.5** (0.542)
<i>IndustryS</i>	-1.772** (0.331)	-1.502** (0.238)	-1.767** (0.239)	-1.741** (0.328)	-1.475** (0.236)	-1.755** (0.236)
Intercept	-4.845	0.226	-2.107	-4.992	-5.558	-2.25
Observations	1014	1014	1014	1014	1014	1014
Hausman test	10.85	8.65	4.79			
R-Squared	0.523	0.423	0.116	0.527	0.428	0.119

Notes: Standard errors are in parentheses. *, ** indicate significance at the 10 and 5% levels respectively.

Table 3. 2SLS Estimation of Determinants of Fiscal Structure of Local Governments in China

Variable	Model 1 (Fixed Effect)			Model 2 (Random Effect)		
	<i>LTF</i>	<i>LTFpc</i>	<i>LTFR</i>	<i>LTF</i>	<i>LTFpc</i>	<i>LTFR</i>
<i>Deficit</i>	0.394** (0.069)			0.382** (0.068)		
<i>Deficitpc</i>		0.428** (0.652)	0.408** (0.653)		0.415** (0.064)	0.399** (0.064)
<i>GDP</i>	1.18** (0.193)			1.213** (0.189)		
<i>GDPpc</i>		1.382** (0.162)	0.25** (0.162)		1.395** (0.1596)	0.259** (0.16)
<i>POP</i>	-0.749** (0.169)			-0.756** (0.167)		
<i>URBAN</i>	-0.175 (0.412)	-0.046 (0.398)	-0.3 (0.398)	-0.001 (0.403)	-0.192 (0.391)	-0.394 (0.392)
<i>EMPLOYR</i>	-1.36** (0.75)	-1.715** (0.733)	-1.998** (0.734)	-1.526** (0.752)	-1.851 (0.733)	-2.108** (0.733)
<i>RES</i>	2.63** (0.59)	2.288** (0.558)	1.329* (0.559)	2.86** (0.57)	2.577 (0.544)	1.53** (0.545)
<i>IndustryS</i>	-2.14** (0.426)	1.557** (0.268)	-1.806** (0.268)	-2.054** (0.422)	-1.513 (0.267)	-1.783** (0.2669)
Intercept	-4.58**	-5.46	-2.129	-4.776	-5.583	-2.266
Number of observations	1014	1014	1014	1014	1014	1014
Hausman test	5.84**	8.72**	3.44**			
R-Squared	0.517	0.421	0.115	0.524	0.427	0.12

Notes: Standard errors are in parentheses. *, ** indicate significance at the 10 and 5% levels respectively.

Major Research Findings

1. This study provides empirical evidence on the relationship between budgetary deficit spending and use of land leasing fees as economic development tools among the Chinese prefecture level cities from 2003-2008.
2. After controlling for simultaneity bias and other factors, it reveals that the size of budgetary deficit spending has a statistically significant positive relationship with the use of the land leasing fees.
3. The land transfer fees are largely used by growing cities as local development financing tools. The degree of reliance on real estate sector is positively related to the use of land transfer fees among Chinese cities

4. The difference in quantity of land supply and consequently land leasing fees is positively correlated with the differential economic performance at Chinese cities from 2003 to 2008, indicating the land transfer fees have become an important local development financing tools in a Chinese city.
5. It also demonstrates that the share of industrial sector in GDP and the employment rate have statistically significant negative relationship with the use of land transfer fees, supporting the hypothesis that the land transfer fees have been used as the local economic development tools in China.

Thanks for Comments!

yman@lincolninst.edu

yman@plc.pku.edu.cn

www.plc.pku.edu.cn