

Why Do Chinese Households Save So Much?

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Consequences of high saving rate

Greenspan, Wall Street Journal, March 11, 2009

“The Fed Didn’t Cause the Housing Bubble”

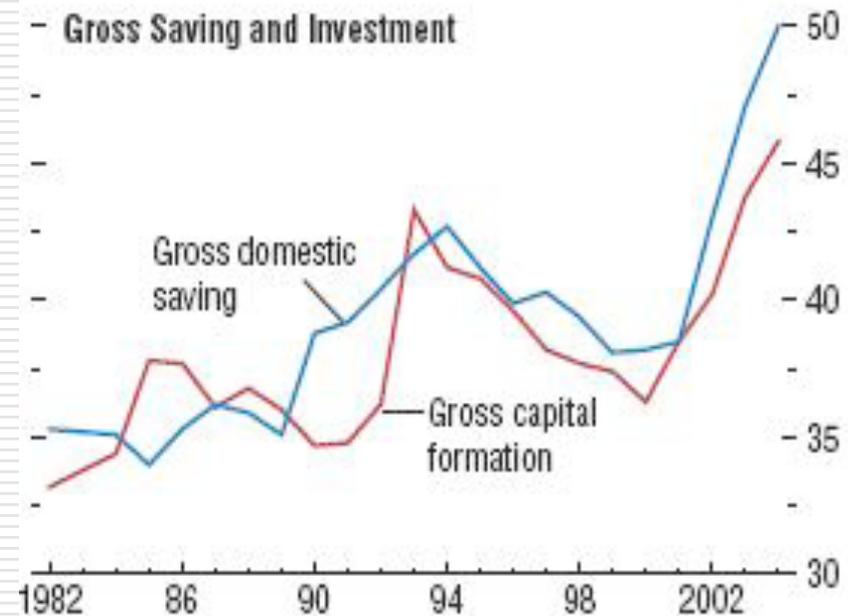
- “... a surge in growth in **China** and a large number of other emerging market economies ... led to an excess of global intended savings relative to intended investment. That ex ante **excess of savings** propelled global **long-term interest rates** progressively lower between early 2000 and 2005.”
 - “The decline in long-term interest rates ... statistically explains, and is the most likely major cause of, real-estate capitalization rates that declined and converged across the globe, resulting in the global **housing price bubble**.”
-

Chinese savings rate today is extraordinarily high

It is high

- relative to other countries
- relative to its own past
- relative to its already high investment rate

China's Saving and Investment by Sector
(Percent of GDP)



Why do the Chinese save so much?

- Life-cycle hypothesis
 - Inadequate social safety net
 - + rising uncertainty
 - Low level of financial development
 - Culture
 - Habit
 - Corporate savings
 - Unintended consequence of social policies?
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Why do the Chinese save so much?

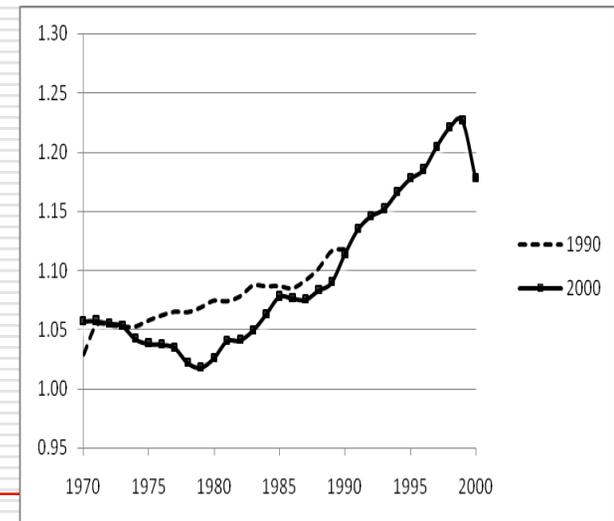
- Life-cycle hypothesis (Modigliani, 1970, and Modigliani and Cao, 2004) predicts that the savings rate rises with the share of working age population in the total population. But it doesn't appear to be consistent with the profile of savings at household level (Chamon and Prasad, 2008)
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New explanation?

- Sex ratio imbalance:
 - Too many men, too few women

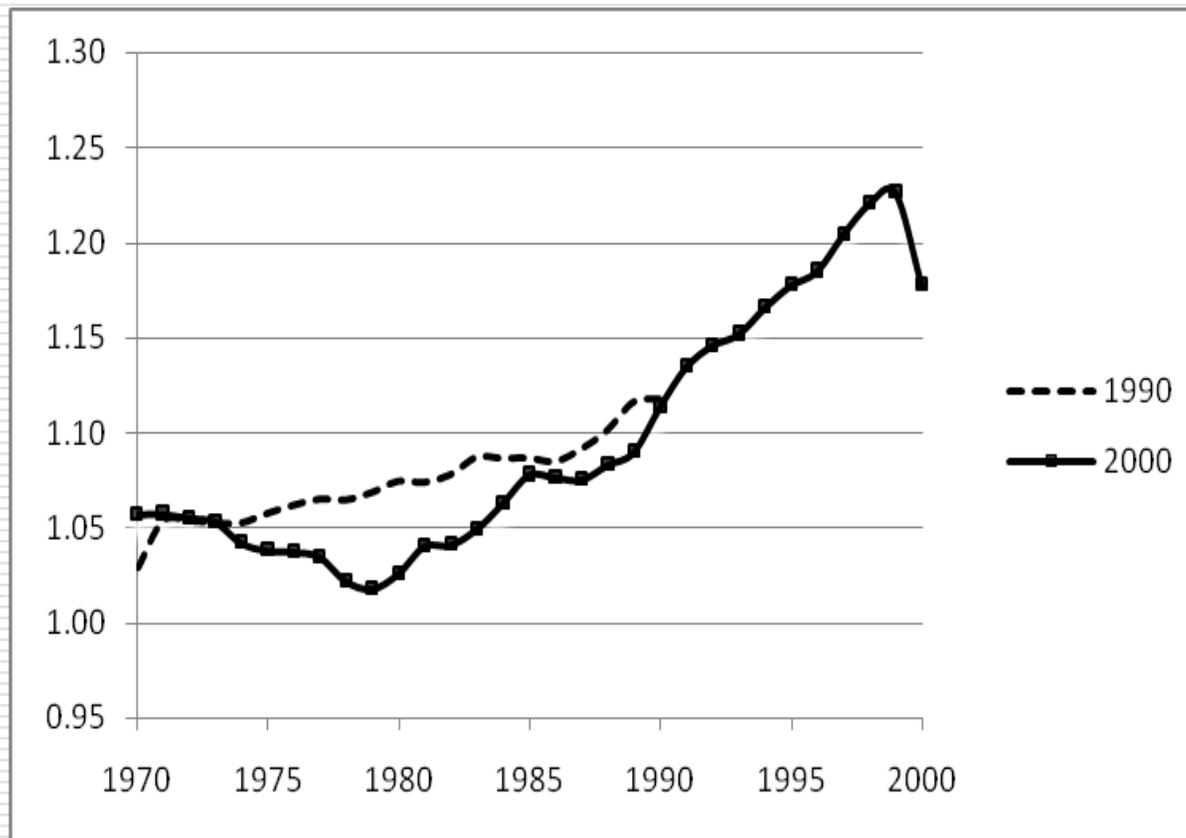
- Nature intended ratio:
 - 105 boys / 100 girls

- A surge in sex ratio in China
 - From 107/100 in 1986 to about 122/100 today.



Sex ratio by birth year

sources: 1990 and 2000 China population censuses



Our hypothesis: Competitive saving motive

- Assuming most men want to be married
 - Parents of a son want their son to get married

- An increase in male/female ratio -> increase competition in marriage market -> men (parents) try things in their power to improve marriage prospect, including raising savings rate.

- Spillover: Competitive pressure raise local housing prices -> necessitates other households to also raise their savings rates

Philosophers



Madonna Louise Ciccone Ritchie
(1958-)

"We are living in a material world,
and I am a material girl.

Some boys try and some boys lie,
but I don't let them play.

Only boys who save their pennies,
make my rainy day"

From Material Girl

Darwin's sexual selection

- Defined as "struggle between the individuals of one sex, generally the males, for the possession of the other sex."

From

[The Descent of Man and Selection in Relation to Sex](#) by [Charles Darwin](#)





- ❑ Visits to the National Zoo
- ❑ Sexual dimorphism – evolutionary biology: Males try to be more attractive to potential mates by making themselves physically larger
- ❑ Men have tried that before ...
- ❑ Now they think making their bank accounts larger might be a little bit more effective

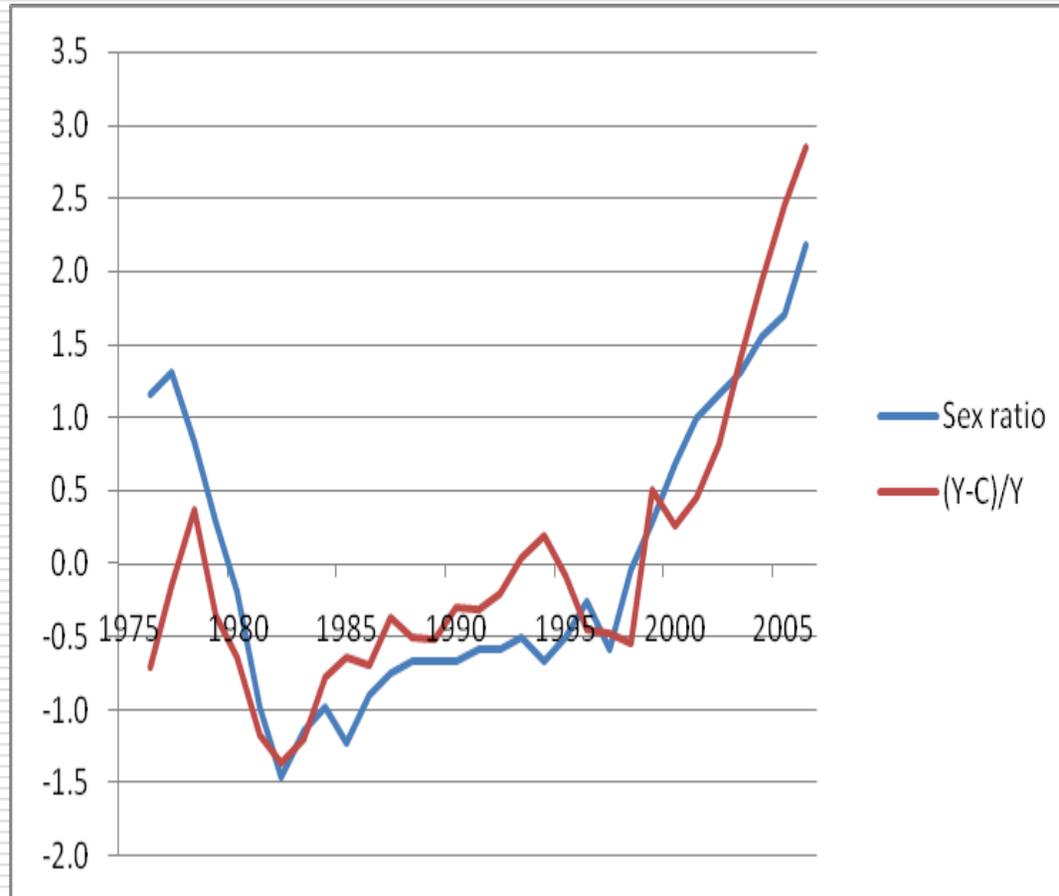






Sex ratio and saving rate in China: 1975- 2005

Sex ratio at birth lagged by 20 years



Empirical support?

Core evidence:

- Cross regions panel fixed effects
 - 2SLS estimation
- Household savings

Additional evidence:

- Time profile of savings w.r.t wedding
 - Sex ratios and housing values
 - bank deposits
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Sex ratios and savings rate across provinces

- Panel fixed effects regressions, 31 provinces, 1980-2007

 - LHS = Local savings rate
 - = $\log(\text{net income/living expenditures})$

 - RHS: Local sex ratio, log income, age profile of population, proxies for access to social safety net, province fixed effects,

 - Local sex ratio is either for age cohort 7-21 inferred from the 2000 population census
-

Sex ratios and savings rates: 1990-2007

Variables	China	Rural	Urban
1990			
Savings rate	0.162	0.116	0.151
Sex ratio for age cohort 7-21	1.045	1.050	1.034
Sex ratio at birth	1.147	1.118	1.107
Per capita income (log)	6.600	6.472	7.278
Share of SOEs in total employment	0.162		0.717
2007			
Savings rate	0.302	0.291	0.319
Sex ratio for age cohort 7-21	1.136	1.147	1.104
Sex ratio at birth in 2005	1.200		
Per capita income (log)	8.743	8.282	9.417
Share of SOEs in total employment	0.082		0.318
Share of labor force enrolled in social security	0.256		

Table 1b: Top and Bottom 5 Provinces in Terms of Sex Ratios (Boys/Girls) at Birth

	Highest Ratios		Lowest Ratios	
1990				
1	Guangxi	1.22	Guizhou	1.00
2	Zhejiang	1.18	Tibet	1.00
3	Henan	1.17	Xinjiang	1.04
4	Shandong	1.16	Qinghai	1.04
5	Jiangsu	1.15	Shanghai	1.05
2005				
1	Jiangxi	1.37	Tibet	1.05
2	Shaanxi	1.32	Liaoning	1.09
3	Anhui	1.32	Jilin	1.09
4	Hunan	1.28	Xinjiang	1.09
5	Guizhou	1.28	Heilongjiang	1.10

Cross regional evidence

LHS variable = log (net income/living expenditures)	1	3	4
Sex ratio for age cohort 7-21	0.39** (0.13)	0.92** (0.26)	0.44** (0.16)
Per capita income (log)	0.26** (0.04)	0.37** (0.07)	0.26** (0.04)
Share of population aged 0-19	0.02 (0.17)	0.04 (0.31)	0.06 (0.20)
Share of population aged 20-59	-0.40* (0.24)	0.22 (0.35)	-0.38 (0.30)
Gini coefficient		0.02 (0.38)	
Life expectancy (log)			-0.12 (0.08)
Share of labor force			-0.04
Province fixed effects?	yes	yes	Yes
Year fixed effects?	yes	yes	Yes
Adjusted R-squared	0.79	0.73	0.79
N	840	112	840

Rural vs Urban

LHS variable = log (net income/living expenditures)	Rural	Urban
Sex ratio for age cohort 7-21	0.75** (0.28)	0.36* (0.18)
Per capita income (log)	0.44** (0.07)	0.28** (0.09)
Share of population aged 0-19	-0.03 (0.36)	0.09 (0.27)
Share of population aged 20-59	1.11 (0.73)	-0.27 (0.44)
Share of SOE employment in total labor force		0.04 (0.07)
Life expectancy (log)	-0.39 (0.40)	0.17 (0.22)
Province fixed effects?	yes	Yes
Year fixed effects?	yes	Yes
Adjusted R-squared	0.75	0.73

Instrumental variable regression:

- First stage specification
 - Thanks to Avi Ebenstein (2008)

 - Sex ratio = a
 - + b1 fine on violating family planning
 - + b2 dummy for extra fines on a higher-order child
 - + b3 share of population not subject to birth quota
 - + residual

 - Hausman-Durbin-Wu test + over-identification test

 - Alternative IV: without minority share
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Table 4: First Stage Regressions – Instrumenting for Local Sex Ratios

LHS variable = Sex Ratio for cohort 7-21	Total	Rural	Urban
	1	2	3
Penalty for violating family planning policy (% of local yearly income 14 years ago)	0.02** (0.01)	0.004 (0.01)	0.007 (0.01)
Dummy for extra penalty for higher order births (14 years ago)	0.04** (0.01)	0.05** (0.01)	0.05** (0.01)
Share of minority population (log) (14 years ago)	-0.06** (0.01)	-0.04** (0.01)	-0.09** (0.01)
Other variables in the 2 nd stage	yes	yes	yes
Adjusted R-squared	0.75	0.76	0.62

Table 5: Instrumental Variable Regressions

LHS variable = local saving rate	Total		Rural	Urban
	Three IVs	No minority share as IV		
	1	2	3	4
Sex ratio for age cohort 7-21	0.74** (0.17)	0.89** (0.31)	0.71** (0.25)	0.61** (0.11)
Per capita income (log)	0.27** (0.02)	0.27** (0.03)	0.44** (0.03)	0.27** (0.03)
Share of population aged 0-19	0.14 (0.10)	0.19 (0.13)	0.14 (0.10)	0.24** (0.11)
Share of population aged 20-59	-0.27 (0.20)	-0.21 (0.24)	0.52** (0.25)	-0.12 (0.14)
Share of SOE employment in total labor force	-0.24** (0.08)	-0.30** (0.13)		0.01 (0.04)
Share of labor force enrolled in social security	-0.04 (0.03)	-0.04 (0.03)		
Province fixed effects?	yes	yes	yes	yes
Year fixed effects?	yes	yes	yes	yes
Adjusted R-squared	0.78	0.77	0.76	0.76
AIC	-2858	-2824	-2112	-2855
Durbin-Wu-Hausman test for endogeneity (p-value)	0.03	0.09	0.44	0.00
Hansen's J statistic for over-identification (p-value)	0.30	0.15	0.00	0.16
N	840	840	840	840

Economic significance

- An increase in the sex ratio for the age cohort 7-21 from 1.045 in 1990 to 1.136 in 2007, leads to a rise in the savings rate by 6.7 percentage points, accounting for 48% of the actual increase in the household savings rate during this period
 - The response of savings rate to sex ratio is stronger in rural areas: an increase in sex ratio potentially explains 53% (26%) of the increase in the rural (urban) savings rate.
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Table 7: Household-level Savings in Rural China in 2002

	With 10% outliers removed			
	Son	Daughter	Two daughters	Son & daughter
Local Sex ratio (county level)	1.36** (0.44)	-0.05 (0.56)	-0.36 (0.57)	0.16 (0.29)
Per capita income (log)	1.96** (0.63)	2.81** (0.79)	1.05 (0.78)	1.04** (0.36)
Household head age	-0.001 (0.01)	0.002 (0.01)	-0.006 (0.01)	-0.003 (0.00)
Household head year of schooling	-0.01 (0.01)	-0.02* (0.01)	-0.04** (0.01)	-0.02** (0.01)
Poor health	0.03 (0.08)	-0.07 (0.08)	0.02 (0.15)	-0.11** (0.05)
N	533	220	163	770

Household savings in urban China

	Son 4	Daughter 5
Local sex ratio (city level)	1.16** (0.46)	0.46 (0.42)
Per capita income (log)	1.54** (0.62)	0.17 (0.49)
Household head age	-0.003 (0.01)	-0.01 (0.01)
Household head year of schooling	-0.01 (0.01)	-0.01 (0.01)
Household head as a minority	-0.05* (0.03)	-0.03 (0.09)
Poor health	-0.03 (0.06)	-0.02 (0.05)
N	259	287

Additional controls for urban savings

□ Precautionary savings:

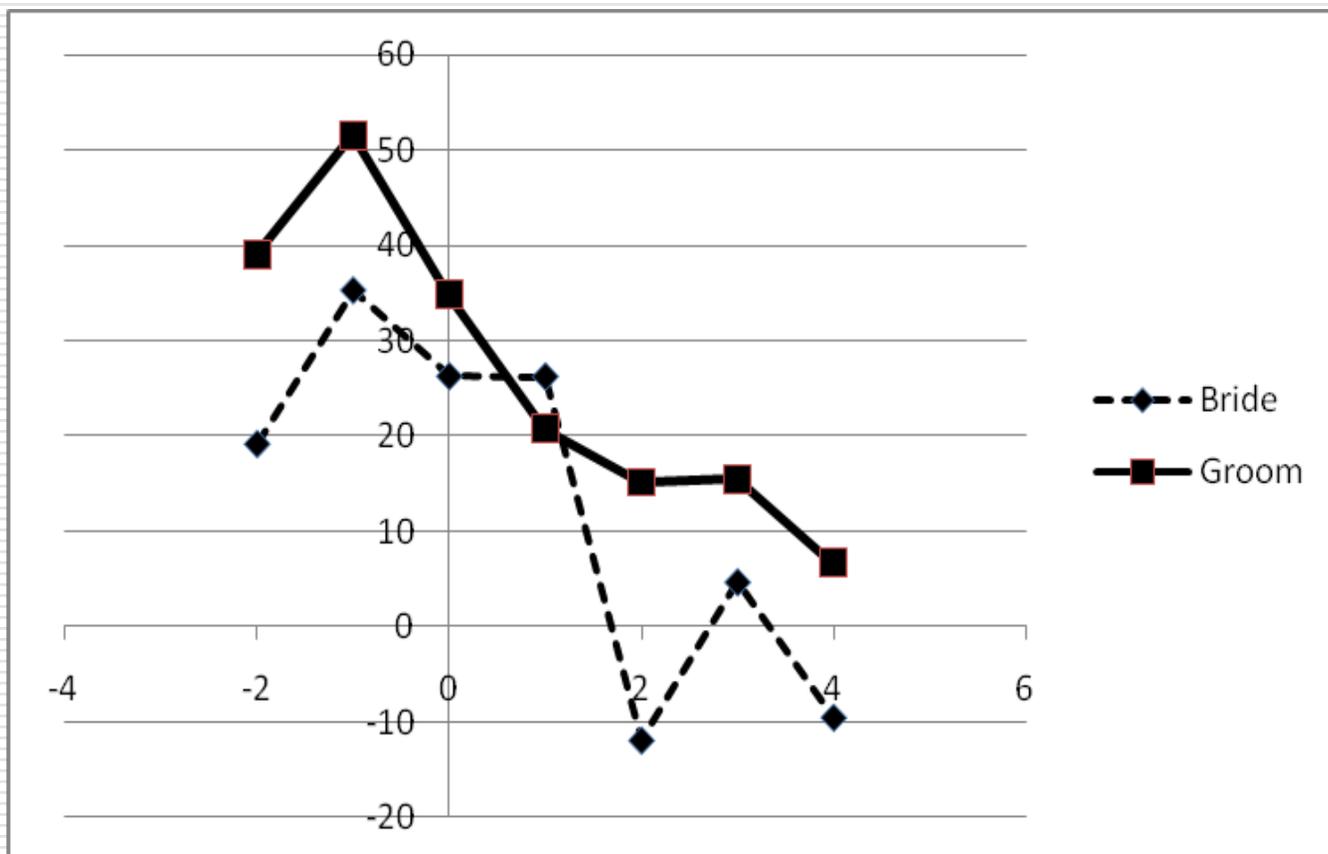
- Dummy for “without public insurance”
- Family members working for SOEs
- Family members being laid off
- Dummy if firms lose money or experience reorganization

□ Liquidity constraint:

- Rent or own a house
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Any direct evidence on savings and wedding event?

- Uncommon to info on wedding in household surveys
 - Survey of villagers in Guizhou in 2005 and 2007
 - Time profile of savings rate w.r.t. wedding event
 - $t = -2, -1, 0, +1, \dots, +4$
-



Household savings rate in relation to the timing of a wedding in the family in rural Guizhou Province

Source: Authors' calculation based on household surveys conducted by IFPRI in 2005 and 2007

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- Direct evidence on spillover from savings by households with a son to savings by other households
-

How to detect spillovers?

- Housing price is the link
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Table 10: Sex Ratios, Housing Size, and Housing Value

LHS Variable = Per capita living space or average housing value (in log) at the county or city level in 2000

	County		City	
	Space	Value	Space	Value
Sex ratio for age cohort 10-19	-0.02	0.37**	0.37**	0.74**
	(0.08)	(0.13)	(0.14)	(0.23)
Per capita GDP in 1999 (log)	-0.04	-0.65**	-0.30	-1.78**
	(0.13)	(0.21)	(0.22)	(0.37)
Per capita GDP in 1999 (log) squared	0.01	0.06**	0.02	0.11**
	(0.01)	(0.01)	-0.013	-0.021
Household size (log)	-0.44**	1.00**	1.55**	0.28*
	(0.07)	(0.21)	(0.11)	(0.16)
Share of population aged 0-19	-2.57**	-4.11**	-2.42**	-0.30
	(0.29)	(0.70)	-0.314	-0.567
Share of population aged 20-59	-1.32**	-2.52**	-1.05**	-0.28
	(0.28)	(0.57)	(0.33)	(0.56)
Province fixed effect	yes	yes	yes	yes
Adjusted R-squared	0.64	0.57	0.69	0.70

Bank Residential Deposit

LHS variable = log (Bank Deposit)	Deposit in 2002			Growth in Deposit 1992-2002	
Sex ratio for age cohort 12-21 in 2002 (or change in sex ratio in the last two columns)	2.54** (0.89)	2.67** (0.92)	1.20** (0.49)	0.43* (0.27)	0.40* (0.22)
GDP/capita in 1999 (log) (or change from 94 to 99 in last two columns)	0.62** (0.04)	-1.72** (0.54)	-1.52** (0.58)	0.08** (0.02)	0.08** (0.02)
GDP/capita in 1999 (log) squared		0.14** (0.03)	0.12** (0.04)		
Share of population aged 0-19 (or change in the population share in the last two columns)	7.12** (1.17)	7.21** (1.17)	10.62** (1.19)	1.12 (0.75)	0.97 (0.85)
Share of population aged 20-59 (or change in the population share in the last two columns)	17.56** (1.25)	17.64** (1.25)	22.77** (1.21)	0.63 (0.66)	0.55 (0.73)
Provincial fixed effects			yes		yes
Adjusted R-squared	0.38	0.39	0.485	0.02	0.08

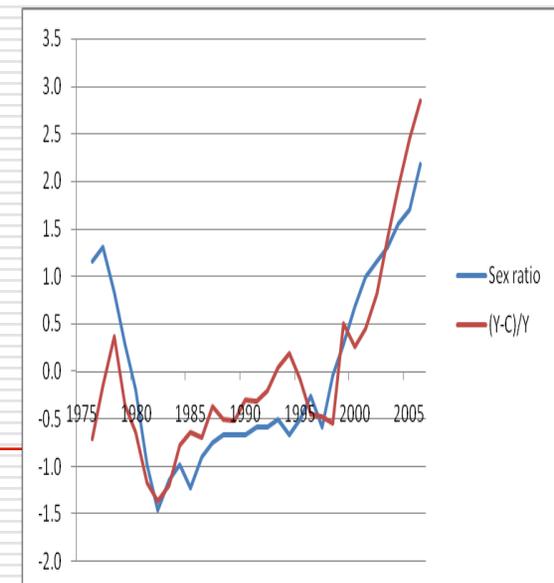
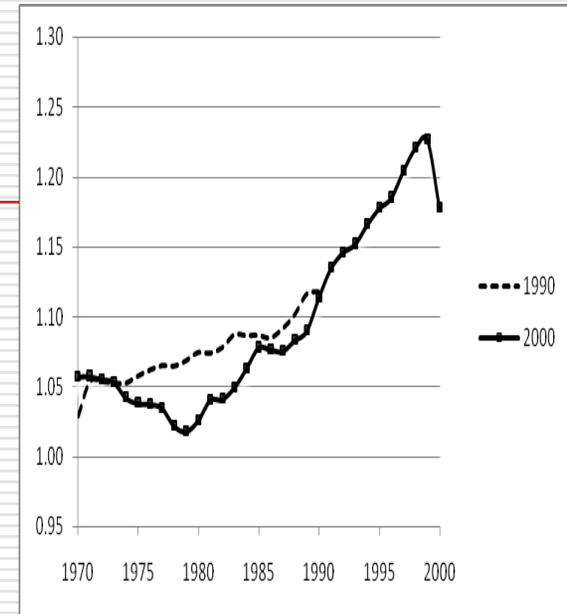
Corporate savings

	Private	Collective	State	Foreign+HMT	All
Sex ratio aged 0-9 in 1990 census	0.59** (0.28)	0.96** (0.32)	-2.61** -1.01	-0.64 (0.47)	1.31** (0.44)
Per capita GDP in 1999 (log)	0.02 (0.02)	0.10** (0.03)	0.02 -0.1	-0.17** (0.06)	0.10** (0.03)
Share of population < 20	2.58*** (0.61)	1.95** (0.95)	1.12 -2.41	1.42 (1.30)	1.11 (0.82)
Share of population > 59	0.5 (0.62)	-0.18 (1.03)	-0.09 -2.56	3.64** (1.50)	-0.68 (0.84)
Adjusted R square	0.04	0.02	0.01	0.02	0.03
AIC	3029	4212	4821	3434	4160
N	1800	1685	1195	1132	1866

Note: the saving rate is defined as $\log(\text{the median value of profit/value added at the county level})$

Concluding remarks (1)

- A rising sex ratio imbalance appears to be a driver for a rising household savings rate
 - Sex ratio imbalance for the premarital age cohort is going to get worse over the next decade before it gets better
 - The pressure on savings rate is also likely to rise over the next decade
-



Concluding remarks (2)

- Rethink policies at adjusting the growth model
 - Role of exchange rate policies?
 - Consumption stimulus policies?

 - Parental preference for a son is likely to reverse itself, but only slowly
 - International evidence from Korea

 - What could reduce savings rate (and current account surplus) eventually?
 - Relaxation of one-child policy?
 - Economic status of women?
-



Year	Wedding: Groom's Exp				Wedding: Bride's Exp		
	Bride-price	Gift to bride	Service	Total	Dowry	Service	Total
1996	2,500	2,000	2,000	6,500	0	1,000	1,000
1997	3,000	1,800	2,000	6,800	1,000	0	1,000
1998	3,500	2,000	2,250	7,750	1,100	500	1,600
1999	2,000	1,800	2,000	5,800	300	0	300
2000	3,000	2,000	2,500	7,500	2,000	150	2,150
2001	3,000	3,000	3,000	9,000	2,000	0	2,000
2002	4,800	4,250	2,400	11,450	400	0	400
2003	3,000	3,500	3,000	9,500	1,900	500	2,400
2004	8,000	2,500	3,500	14,000	N/A	N/A	N/A
2005	9,500	5,250	3,700	18,450	2,000	0	2,000
2006	8,800	5,600	3,750	18,150	2,250	3,500	5,750

8 times of per capita income

All the families keep the record of gifts received in big events
The average price of gifts has doubled from 2004 to 2006
Ideal for network analysis

李	
張	
張	50元
張	60元
姚仕叔	50元
姚仕洪	50元
孔德年	100元
柳興志	20元
趙崇學	30元
鄭成友	50元
	485元

姚仕文	50元
張友友	80元
柳家凱	30元
柳梅發	40元
江玉敏	50元
張晉洪	50元
年光圓	50元
廖健	100元
	600元

Houses and tombs are important status goods
Without a new house, it is difficult for a son to find a wife



A tomb like this costs more than one year's income.
But people are still competing to build ever bigger ones

