Economic Development, Urbanization and Insurance Consumption
- The experience of China

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Agenda Today

- Urbanization
- Literature review
- Data and model
- Empirical results
- Conclusion

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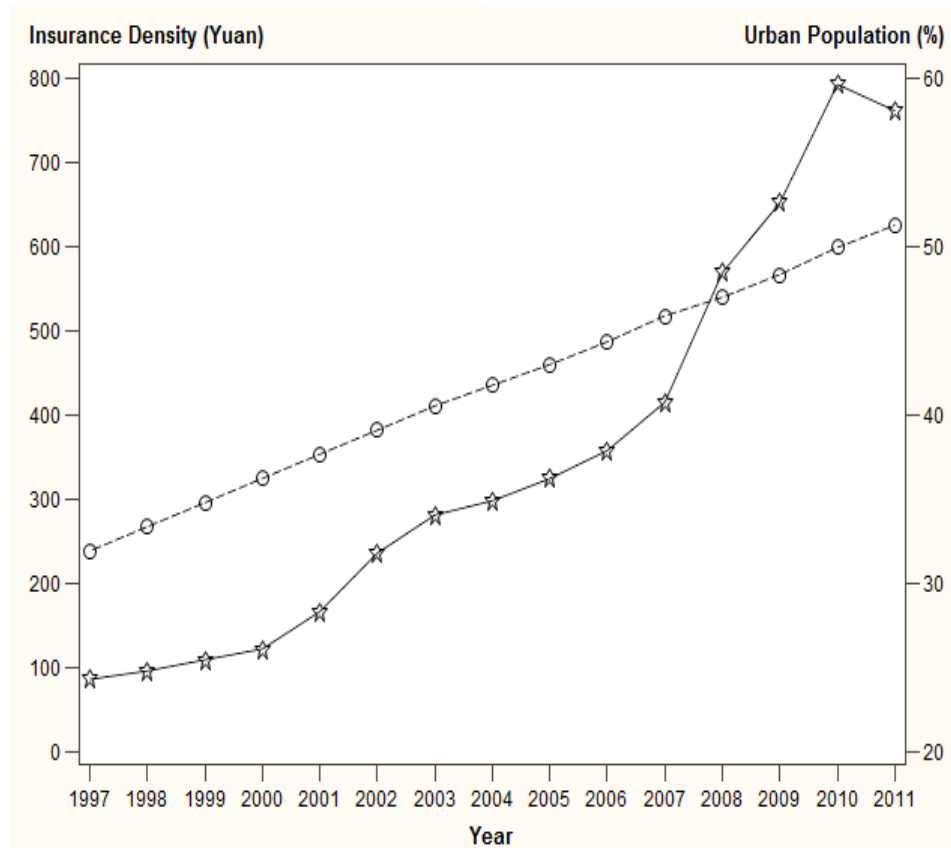THE PETER J. TOBIN COLLEGE OF BUSINESS

Urbanization

- A high proportion of the population lives in cities (Davis 1955)

- China's urban population as % of total:
  - 17.92% (200 million) in 1978
  - 26.2% (296 million) in 1990
  - 49.5% (670 million) in 2010

Research Question

- Is urbanization related to insurance consumption?

Literature Review

- Urbanization is pushed by division and specialization of labor - Stigler (1951), Evans (1972)

- Urbanization stimulates domestic demand, supports the adjustment of economic structure, and powers the economic growth. - Lampard (1956), Berry (1965), Northam (1975), Renaud (1981), Henderson (2000), and Bertinelli and Strobl (2003).

- Positive relationship between the net migration from rural to urban areas and gross national product - Ledent (1982)

- Urbanization increases with GDP, industrialization and export orientation- Moomaw and Shatter (1996)

Literature Review (Continued)

- In the world with transaction costs, the factors that relate to insurance demand are the same as for corporate and individuals(Browne et al (2000)):
  - perception of exposure at loss
  - affordability of insurance
  - chance of loss (probability),
  - the decision maker's attitude toward risk.

- Browne et al (2000) use urbanization as the proxy for loss probability in modeling demand for property-liability insurance.

- Beck and Webb (2003) hypothesize a positive relationship between urbanization and life insurance consumption but do not find a significant empirical result.

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What's New

- We use Urbanization in both models for property-liability insurance demand and life insurance demand.

- We hypothesize that urbanization is positively related to consumption of both life and property insurance.

Table 1: Summary of Variables

| Variable Name	Definition	Unit of measure	
Insurance density	Per capita insurance premium	Yuan (Chinese currency)	
Savings	Per capita savings. Proxy of wealth.	Yuan	
Income	Per capita income.	Yuan	
Fixed asset investment	Per capita investment in fixed asset.	Yuan	
Education	Percentage of adult population (age 16-64) that have college degree	percentage	
Urbanization	Percentage of population that live in urban area	percentage	
Dependent ratio	Percentage of population that are below 16 or over 64 in age.	percentage	
Life expectancy	Average life expectancy.	year	
Geographic dummies	Dummy variables for areas of each province. The areas are East, North, South, Northeast, Southeast and Southwest.		
WTO	Dummy variable, = 0 for years before 2001, and 1 otherwise		

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Table 2: Descriptive Statistics

| Variable	Mean	Median	Standard Deviation	Minimum	Maximum
Dependent variables					
Life Premium Density	283.67	165.33	382.10	.07	3006.88
Property-liability Premium Density	111.49	68.96	123.75	.30	962.80
Combined Premium Density	399.81	242.35	504.00	18.69	3853.74
Independent variables					
Urban Savings per capita	24902.14	20659.44	17593.76	6070.31	159726.07
Rural savings	3769.65	1884.31	5987.80	.80	62605.11
Urban income	9325.07	8322.94	4283.72	3491.19	27329.96
Rural Income per capita	3342.82	2817.14	1831.69	1148.84	12109.95
Fixed Assets Investment per capita	7322.78	4865.46	6650.42	596.37	40544.62
Dependent	40.12	40.15	7.89	19.27	63.17
Education	6.50	5.19	4.97	0.13	33.94
Life expectancy	72.66	72.92	3.27	63.47	81.36
Urbanization	33.51	28.39	16.11	13.84	89.32

Table 3: Pearson's correlation coefficients

	Density life	Density property	Urban Savings	Rural Savings	Urban Income	Rural Income	FAI	Dependent	Education	Life Expectancy
Density-life										
Density-property	.8111									
Urban Savings	.6671	.7449								
Rural Savings	.7949	.8252	.8430							
Urban Income	.7904	.8624	.8254	.8302						
Rural Income	.8202	.8529	.7269	.8519	.8898					
FAI	.7612	.8712	.7502	.8049	.8781	.8266				
Dependent	-.7138	-.6735	-.4932	-.6849	-.6054	-.7041	-.6675			
Education	.7421	.7768	.5620	.6850	.6445	.7052	.6413	-.6859		
Life expectancy	.7825	.7116	.5756	.7534	.6958	.8863	.6681	-.6797	.6524	
Urbanization	.6731	.6856	.3535	.6190	.4795	.6628	.5415	-.7076	.8252	.6890

Figure 2: Unbalanced Insurance Market in China


Insurance Density (Yuan)
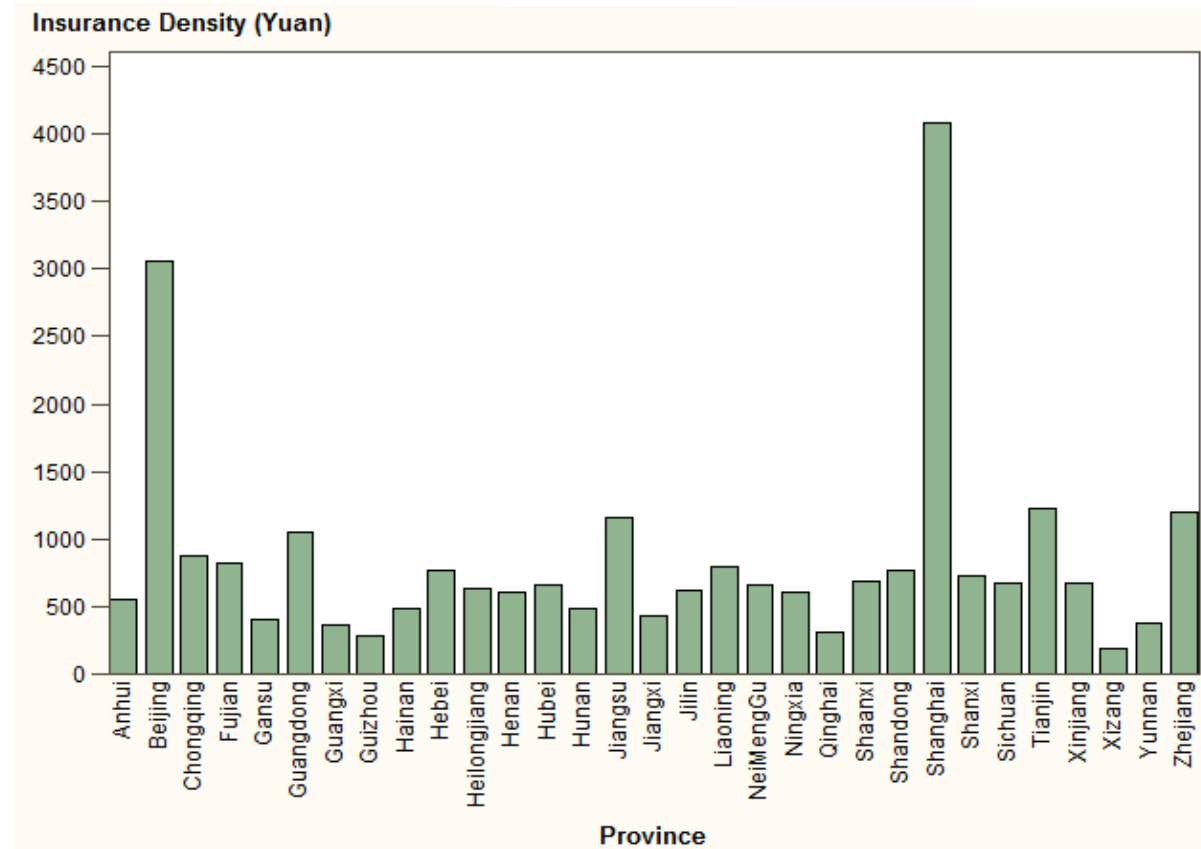
Province

Figure 3: Trends of Insurance Density, by Province

Insurance Density (Yuan)
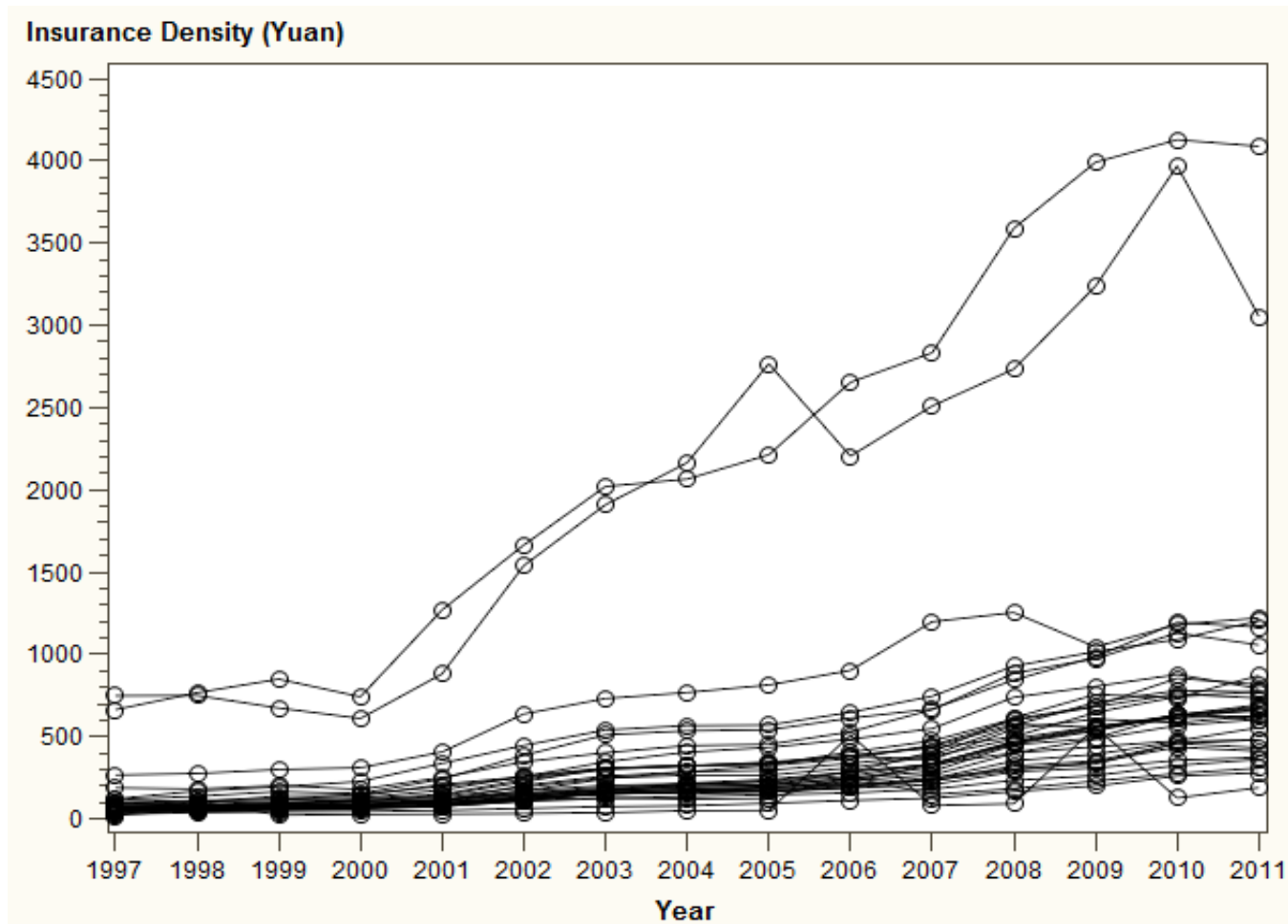
Model

- One-way fixed model

$$y_{i,t} = \alpha_i + \beta_1 y_{i,t-1} + \beta_2 LOG(Urban\ Savings)_{i,t} + \beta_3 LOG(Rural\ Savings)_{i,t}$$

$$+ \beta_4 LOG(Urban\ Income)_{i,t} + + \beta_4 LOG(Rural\ Income)_{i,t} + + \beta_5 LOG(Fixed\ Assets\ Investment)_{i,t}$$

$$+ \beta_6 Education_{i,t} + \beta_7 Urbanization_{i,t} + \beta_8 Dependent_{i,t} + \beta_9 Life\ Expectancy_{i,t} + \beta_{10} WTO + \varepsilon_{i,t}$$

Table 4: Empirical Analysis Results

	Life Insurance Density		Property-liability Insurance Density	
Independent variables	Coefficient	p-value	Coefficient	p-value
LAGGED PREMIUM DENSITY	.6465	<.0001	.8802	<.0001
URBAN SAVINGS	.1027	.0006	.0657	.0089
RURAL SAVINGS	-.0791	.0536	-.0301	.3775
URBAN INCOME	-.0578	.3356	-.0976	.0479
RURAL INCOME	.0336	.7351	-.0087	.9139
FIXED ASSET INVESTMENT	.0669	.0133	.0996	<.0001
HIGH EDUCATION	-.0106	.1086	.0153	.0048
URBAN POPULATION	.0104	.0150	.0127	.0003
WTO MEMBER	.3126	<.0001	.0662	.0059
DEPENDENT RATIO	-.0069	.0682	NA	NA
LIFE EXPECTANCY	.0394	.0013	NA	NA
SAMPLE SIZE	459		463	
R^2 –ADJUSTED (%)	97.32		97.08	
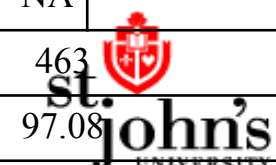
Statistical Concern

- To mitigate multi-collinearity among savings, income and fixed asset investment variables, we center these variables by subtracting the average and dividing by the standard deviation.

- Standardization for each variable is done by year, to retain temporal variation of each variable.

Statistical Concern (continued)

- Scatter plots of standardized residuals against predicted values from both life insurance and property-liability insurance models displayed no heteroscedasticity problems.

- Normal probability plots of residuals suggest the normal distribution assumption of the residuals in each model is not seriously violated.

Major Findings

- Urbanization is positively related to consumption of both life and property insurance in China

- The effects of control variables are generally consistent with literature.

Concluding Remarks

- Urbanization may be related to higher expected loss, thus boost the demand for insurance.

- Data availability issue

Questions and comments?

Thank You!