How can China Become a Real Insurance Power? Findings from the study on the impacts of social advance on insurance market

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ABSTRACT

Social advance is the process in which elements constituting society develop and change. As insurance is a social product and serve for the whole society, we want to know whether or not and how social development exert influence on insurance sector. In this study, we use data of 48 economies in period of 2001-2015 to explore the impacts of social advance on insurance market by setting panel and cross-section models from demographic, economic, medical and institutional aspects. The measures of insurance market are insurance penetration and insurance density. The results show that financial depth, social security and political stability appear to have no robust association with insurance sector, while certify the impacts of demographic, medical and other economic factors on the insurance measures, especially on insurance density. Meanwhile, there are marked differences between the results from developing economies and those from the full sample. As China is a "big insurance market" with insufficient coverage and depth, we can draw some useful things from the analysis and promote the transformation of China insurance market from a big one to a real power.

Key words: Social advance, Insurance penetration, Insurance density, Penal, Cross-country analysis

INTRODUCTION

Recently published reports showed that the gross insurance premium in China increased to about 476 billion US dollars with a year-on-year growth of 27.49% in 2016, which won China a ranking seat in the global market. However, insurance penetration and insurance density in China were only 4.16% and 356.5 US dollars in the same year, which were even far from the global average level of 6.86% and 662 US dollars. This reflects the real situation of China insurance industry—scale is sizable, while extents of coverage and depth are insufficient.

Insurance penetration is the ratio of one country's total insurance premium to its GDP (gross domestic production), which measures the coverage for the national economy by the insurance market and reflects the importance of insurance in the whole economy structure. Insurance density represents the insurance consumption in one country and is defined as insurance premium per capita. The insurance penetration in China experienced a significant fluctuation in the past few years. (See Figure 1) It kept declining from 2003 to 2.6% in 2005. After slightly bumping up, it dropped sharply again in 2011. So the changing trend of insurance penetration was not stable and remained at a low level. In comparison, the density measure rose steadily with an accelerating increase rate, which gained an almost 5-fold increase from less than 50 to 280 dollars in 15 years. Nevertheless, there's still a great gap between China and the global average level both in insurance penetration and density.
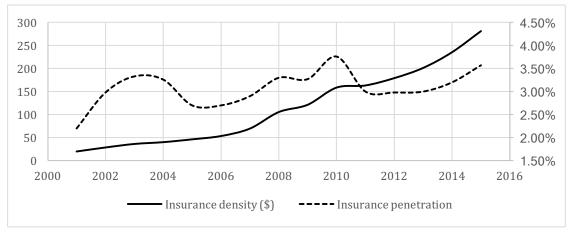
Figure 1. Historical Trends of Insurance Penetration and Density of China

In 2014, Chinese government introduced a guidance document to promote the insurance sector. In the new plan, there were expected to see a modern insurance service system in 2020, which would perfectly meet the demands of economic and social development. And China should make efforts to transform from a "big insurance market" to a really powerful one. The specific goal was to reach an insurance penetration of 5% and insurance density of around 570 US dollars in 2020. Then here, insurance was tightly connected with the whole social development, and its nature of protection was emphasized. Meanwhile, insurance density and insurance penetration were identified as two important measures of a country's insurance industry. Insurance is born as safeguard of social and economic stability and the product of social development. So it shall change along with social advance. Therefore, society is insurance market's growing bed. The development of the insurance market is the result of the combined action of many factors in social advance.

Social advance is an aggregate conception involving the development and changes of various elements that constitute society. Currently, how does insurance promote economic growth has been the focus of related topic (Outreville, 1990; Arena and Marco, 2008; Kok, Mori and Fumitaka, 2010). Some previous researches discussed the economic, demographic, capital and institutional determinants of life insurance consumption (Kim and Doocheol, 1988; Lewis and Frank, 1989; Oureville, 1996; Beck and Webb, 2003). While in China, it has been a common view that economy growth promotes the insurance sector (Wu and Zhao, 2010; Zhang, 2013). Besides, several studies showed that insurance market could be influenced by the changing demographic structure (Guo and Zhang, 2005; Zhang and Shang, 2011; Liao and You, 2012; Zhang, 2013). Some scholars put their eyes on qualitative analysis of relationship between social development and social insurance (Jia and Li, 2006; Kang and Wang, 2010; Xiao, 2012).
The previous works certified the impacts of some social factors on insurance market. But limited by the sample, variable and method differences, the conclusions are difficult to replicate. Meanwhile, for the relationship between a country's social advance level and its insurance market has not been deeply explored, we'll talk about it in this paper.

To have a clear understanding of the impacts and make the results more helpful as a reference for China, we carry out some innovations upon the previous studies. Firstly, we use a more expended sample set involving 48 countries after considering the data availability. Secondly, the explaining variables contain several aspects on social advance, including demographic, medical, economic and institutional factors. Thirdly, we use both panel and cross-country analysis to take their respective advantages to get results from different perspectives.

DATA AND VARIABLES

After the overall consideration of the gross insurance premium, insurance penetration and insurance density, we select 48 economies from the list of top30 on the three indicators in 2015 and the economies that were close to China in insurance density in the same year. And the data period is 2001-2015.

We use insurance penetration and insurance density to measure the development level of a country's insurance market. The reason for the choice is that these two indicators were generally used in the previous researches and taken as measurements of insurance market maturity in related Chinese government documents.

Based on the 10 indicators of social modernization put forward by American sociologist Alex Ingalls, the current social development evaluation system in China and the previous related researches, we select 4 sets of explaining variables. They are demographic factors including young dependency ratio, old dependency ratio, life expectancy at birth, schooling years and urbanization; economic factors including GDP per capita, unemployment rate, GINI index, social security, financial depth and inflation rate; institutional factors including rule of law, political stability and government effectiveness; medical factors including medical expenditure per capita and public health expenditure. We also involves human development index, an indicator comprehensively measures the living situation of a country's citizens, in our models. The descriptions and sources of the variables and data are in Table 1.

Table 1 Definitions of Variables

Variables	Definition	Variables	Definition
Insurance density	Gross insurance premium divided by total population in a country.	Insurance penetration	Gross insurance premium as a share of total GDP in a
Demographic		**Economic**	
Young dependency ratio	The ratio of people younger than 15 to those ages 15-64.	GDP per capita	GDP divided by population in a country (current US dollars)
Old dependency ratio	The ratio of people older than 64 to those ages 15-64.	Unemployment rate	The share of the labor force that is without work but
Life expectancy at birth	The number of years a newborn infant would live if prevailing patterns of mortality at the time	GINI Index	Measures the extent to which the distribution of income among individuals or households within an economy deviates from a
Schooling years	Average years spent in school by age group and gender.		
Secondary enrollment	Net enrollment rate for secondary schools for children of	Social security	Ratio of government subsidies, endowments and
Urbanization	Refers to the share of the people living in urban areas in total population of a country.	Financial depth	Demand, time and saving deposits in financial
		Inflation rate	Consumer price index.
Medical			
Health	The sum of public and private health expenditures as a ratio of total population. (current US dollars)		
Public health	Consists of recurrent and capital spending from government budgets, external		
Institutional			
Rule of Law	Captures perceptions of the extent to which agents have confidence in and abide by the rules of society, as well as the likelihood of crime and violence. Estimate gives the		
Political stability	Measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Estimate gives the country's score on the		
Government efficiency	Captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's		
Human	It's a comprehensive measurement of the life expectancy, schooling and income of a		
Compulsory	Duration (years) of compulsory education in countries.		

Descriptive Statistics
Table 2 shows the descriptive statistical results of the variables. We can see that there are obvious internal differences of all the variables. The maximum of insurance density reached a high level of 8,012 US dollars, which was 4.5 times of the mean value. As to the demographic aspect, some country's young dependency ratio exceeded 50%, while some other's less than 20% in particular years. The longest average education years was 13.4 when the shortest was only 4.5. In the economic indicators, there was significant income gaps among the countries in our study period, where the lowest 471.3 US dollars was only 0.39% of the maximum. Meanwhile, countries were in different political situations which could be concluded from the data statistics of institutional variables. The most unstable country even got an almost inferior limit score on political stability. In the medical factors, the minimum value of health expenditure per capita was only 20.94 US dollars, which was less than 1% of the maximum.

Table 2 Descriptive Statistics（2001-2015）

Variables	Min	Median	Sd.	Mean	Max	Samples
Insurance density	11.20	1159.80	1873.99	1767.80	8012.00	697
Insurance penetration	0.00[a]	0.05	0.04	0.06	0.19	699
Young dependency	0.19	0.28	0.11	0.32	0.67	720
Old dependency ratio	0.02	0.18	0.08	0.17	0.43	720
Life expectancy at	51.56	77.45	5.32	76.32	83.84	720
Schooling years	4.50	10.30	2.15	9.95	13.40	720
Secondary enrollment	0.49	0.88	0.10	0.86	1.00	436
Urbanization	0.28	0.76	0.15	0.73	1.00	720
GDP per capita	471.30	21727.90	22947.47	25859.20	119116.10	720
Unemployment rate	0.01	0.07	0.05	0.08	0.28	690
GINI Index	0.24	0.35	0.09	0.38	0.65	337
Social security	0.00[b]	0.14	0.09	0.15	0.37	591
Financial depth	0.10	0.58	0.58	0.69	4.80	691
Inflation rate	-0.02	0.03	0.06	0.04	0.81	720
Rule of Law	-1.25	0.64	0.98	0.70	2.12	672
Political stability	-2.39	0.43	0.84	0.29	1.66	672
Government	-0.98	0.76	0.90	0.82	2.43	672
Health expenditure	20.94	1193.52	2312.62	2231.76	9719.99	672
Public health	0.22	0.70	0.16	0.66	0.90	672
Human development	0.50	0.80	0.09	0.81	0.95	720
Compulsory	5.00	10.00	1.75	9.76	15.00	692

a.b：**The accurate data is less than 0.005 and displayed as 0.00。**
Data sources: World Bank, Swiss Re, IMF, UNDP.

Correlation test
Table 3 shows the correlations between selected social advance variables and insurance market measurements (insurance density and insurance penetration). We can see that all the explaining variables are significantly correlated with insurance indicators. For the panel model can automatically decrease the influence of multicollinearity, the whole correlation test results are not reported here.

Table 3 Correlations between Social Advance Variables and Insurance Market Measurements

Variables	Insurance	Insurance	Variables	Insurance	Insurance
Young	-0.2010***	-0.1352***	Unemployment	-0.2409***	0.0808**
Old	0.6321***	0.5060***	GINI Index	-0.5638***	-0.4070***
Life expectancy	0.6191***	0.2428***	Social Security	0.4151***	0.3639***
Schooling years	0.7092***	0.5329***	Rule of Law	0.8229***	0.6414***
GDP per capita	0.8687***	0.4531***	Political stability	0.6779***	0.5059***
Financial depth	0.5106***	0.3198***	Government	0.8316***	0.7000***
Inflation rate	-0.4019***	-0.3420***	Health	0.8823***	0.4997***
Secondary	0.5155***	0.4500***	Public health	0.3768***	0.1297***
Urbanization	0.4357***	0.2324***	Human	0.7860***	0.4916***

Note: '*', '**' and '*' respectively represent significant on the level of 1%, 5% and 10%.**

MODELS AND THEORETICAL HYPOTHESIS

Models

Given the correlations among the explaining variables, we use multivariate regression method in this study. Considering the above correlation results and sample size, we take GDP per capita, dependency ratios (young and old), life expectancy at birth, schooling years, inflation rate and financial depth as the baseline variables and others as additional variables in the subsequent regressions. To decrease the volatility, we use the logarithm of original values of variables in the models expect for inflation rate.

In the panel analysis, we use Hausman Test to see whether there is a fixed effect or not. When the result rejects the null hypothesis (p value less that 5%), we set up fixed effect model and certify the effect type (individual, time or two-ways) with Lagrange multiplier test. The fixed effect penal model is as below:

$$Ins_{it} = \alpha_t + \sum_{k=1}^{n} \beta_k BV_{k_{it}} + \theta_j \cdot AdV_{j_{it}} + \delta_{it} + \varepsilon_{it}$$

When there is no fixed effects, we set up random effect penal model as below:

$$Ins_{it} = \alpha + \sum_{k=1}^{n} \beta_k BV_{k_{it}} + \theta_j \cdot AdV_{j_{it}} + \varepsilon_{it}$$

Where Ins_{it} is the insurance measurements of country t in year i; α is constants, β and θ are coefficients of the explaining variables. BVs are the baseline variables and AdVs are the additional variables. δ is the fixed effect, and ε represents error term.

In the cross-country analysis, we set up cross-section model using the average values of all the variables during 2001 to 2015, and the model is as below:

$$Ins_t = \alpha + \sum_{k=1}^{n} \beta_k BV_{k_t} + \theta_j \cdot AdV_{j_t} + \varepsilon_t$$

Where α is constants, β and θ are coefficients of the explaining variables, and ε represents error term.

Theoretical Hypothesis
Demographic variables
Higher young dependency ratio requires more coverage for morality risks faced with the "backbones of families", but decreases people's needs for deposit insurance. Comparatively low purchasing power caused by large portion of young may also level down a country's insurance consumption. But the old dependency ratio could have an opposite impact. Aging population will put more attention on the income sources after their retirements, which will magnify the saving function of insurance and weaken the morality guarantee function. Besides, people may tend to purchase more saving products for the living after retirements if they can live longer. And longer lives mean longer risk exposure time, which may lead to more consumption of non-life insurance products at the same time. But lower morality risks may reduce the demands for life products. Therefore, the impacts on insurance measurements from dependency ratios and life expectancy at birth are all ambiguous.

We assume that insurance consumption will be positively associated with education. With the rising of education level, citizens may deal with potential risks in a more rational way and their insurance awareness will increase. But what should be noted is that insurance can bring down people's uncertainty about the future, which may in return encourage them to get longer education. This could possibly induce endogenous problem of the model.

Consumer gathering caused by urbanization may lower the distribution cost of insurance products, which can promote the industry from supply aspect. At the same time, urbanization may transfer people's needs for informal mutual agreements into insurance demands (Beck and Webb, 2003). So we assume that urbanization has positive impact on insurance market.

Economic variables
Income growth has been very important for insurance market development. Higher income means more wealth and consuming power. And more wealth means more risks need to be covered and more assets needs appreciation. Many previous researches have verified its positive impact on insurance consumption (Browne and Kim, 1993; Beck and Webb, 2003). So we assume GDP per capita, which represents income level here, has positive relationship with insurance measurements.

We use demand, time and saving deposits in financial institutions as a share of GDP as a measurement of a country's financial depth. With the financial deepening, insurance institutions can invest more effectively, improve the operation stability and make their products more appealing. So we think it's possible that financial depth has a positive impact on insurance market. But as a branch of the whole financial system, insurance may affect the financial system in return.

According to the macroeconomics theory, mild inflation can promote economic growth. But when exceeding some level, it could damage people's trust in money value and spend more on physical consumption rather than investment or insurance. So high inflation rate may have negatively influence on insurance market.

Losing jobs means losing income, and consumption level can't be brought down at once with the shortened income according to the "ratcheting effect" theory. Then insurance will becomes luxurious. So we assume insurance consumption would decrease with the increase of unemployment rate.

GINI index measures the equality level of income distribution within a country. Smaller index value represents comparatively more perfect equality. For very wealthy and very poor groups both have low demands for insurance, we assume a high GINI index would hinder the expansion of insurance market.

Social security can be some kind of substitution for commercial insurance products. Covered by perfect social security system, people would have less fear towards risks to purchase insurance. So we assume the more a country's government inputs on social security, the slower its insurance market development would be.

Institutional variables
The living and development of insurance market relies on stable and efficient institutional environment. Rule of law measures the extent to which people use legal method to deal with economic activities as well as the likelihood of crime and violence. Political volatility may bring up the uncertainty of contract enforcement, then damage the normal economic order. Better government efficiency means better regulation and market order, which can increase people's confidence about insurance industry and products. So higher values of these indicators would be corresponded by higher insurance consumptions.

Medical variables
Rising health expenditure per capita can probably stimulate the purchasing on health and endowment insurance products and bring up people's risk aversion. Expanded public health expenditures may likely relieve citizens' economic pressure on health care and squeeze out insurance premium. But it can improve the medical environment and quality, which will increase people's expectation on the medical costs in the future. So the impact of public health expenditure is ambiguous before our regression.

Human development index is a comprehensive index calculated to reflect citizens' living standard after considering life expectancy, education and income level in a country. For we can't certify the life expectancy's impact, the result of this index is also hard to foresee.

RESULTS AND ANALYSIS
Panel analysis
We conduct multivariate panel regressions to assess which social advance factors robustly explain the changes on insurance penetration and density, where the data we use are unbalanced panels because of some particular missing values.

Table 4 presents the results of regressions where we take insurance penetration as the insurance market measure. According to the Hausman test results, we control both fixed time and country effects in the regressions.

The results shows that the changes of insurance penetration can be well explained by the variations of dependency ratios and life expectancy at birth, whose coefficients are significant in the baseline regression and the most of subsequent ones. In the baseline results, a 10% increase in young dependency ratio causes a 0.6% decrease of insurance penetration. But when old dependency ratio or life expectancy increases 10%, the insurance penetration rises by 1.5% or 1.3%, which suggest that population aging promotes higher insurance demands.
In the additional variables, urbanization, government efficiency and health expenditure per capita are all good predictors of insurance penetration, which are in line with our assumption. Public health expenditure also has positive relationship with insurance market deepening. The

positive coefficient of human development index demonstrates that the insurance consumption increases with the rising living standard of citizens.

When limited to developing countries, we find the explanation of life expectancy is no longer robust, while schooling years and inflation rate become significant. A 10% increase of schooling years or inflation rate can bring a 0.23% or 1.5% increase of insurance penetration. The possible reason is that the inflation in developing countries were generally mild and controllable, which was a favorable factor for the insurance market.

The significances of all the other social advance indicators are not verified, especially GDP per capita and financial depth, which were assumed to be probably good predictors of insurance market development. One of the possible explanations is that insurance penetration itself is calculated using GDP, which means its variation has been determined by GDP at first. It's maybe not reasonable to use related indicator to explain its changes. Meanwhile, from the original data, we could see that insurance penetrations of globally recognized insurance powers are mainly between 7% and 10%. And the countries with very high insurance penetration are all those with small population and economy size, and simply industrial structures. So we think insurance penetration is not appropriate to be the main measurement of the insurance markets.

Table 4. Social Advance Determinants of Insurance Penetration

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GDP per capita	0.010	0.021	-0.017	-0.009	0.039	0.004	0.008
	(0.054)	(0.65)	(-0.93)	(-0.42)	(1.39)	(0.18)	(0.44)
Young dependency ratio	-0.061	-0.030	-0.053	-0.095	-0.108	-0.058	-0.075
	(-3.50)***	(-1.27)	(-3.03)***	(-4.25)***	(-2.54)**	(-2.68)***	(-4.04)***
Old dependency ratio	0.148	0.182	0.113	0.142	0.231	0.269	0.156
	(4.33)***	(3.89)***	(3.23)***	(4.08)***	(2.68)***	(5.68)***	(4.23)***
Life expectancy at birth	0.132	0.358	0.129	0.138	-0.045	0.164	0.107
	(3.44)***	(5.49)***	(3.39)***	(3.468)***	(-0.64)	(3.40)***	(2.63)**
Schooling years	0.012		0.009	0.015	0.002	0.002	0.005
	(1.53)		(1.20)	(1.74)*	(0.13)	(0.15)	(0.58)
Inflation rate	0.012	0.019	0.008	0.007	0.008	0.010	0.016
	(1.23)	(1.75)*	(0.96)	(0.78)	(0.66)	(0.60)	(1.52)
Financial depth	-0.012	-0.014	-0.008	-0.013	-0.014	-0.023	-0.009
	(-1.81)*	(-1.43)	(-1.09)	(-1.86)*	(-1.36)	(-2.78)***	(-1.34)
Secondary enrollment		0.010					
		-0.510					
Urbanization			0.116				
			(3.78)***				
Unemployment rate				-0.002			
				(-0.13)			
GINI index					-0.001		
					(-0.11)		
Social Security						0.025	
						(1.11)	
Rule of Law							-0.003
							(-0.99)
Hausman Test	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Observations	679	417	679	649	325	555	468
F-statistic	6.21***	6.95***	7.35***	6.24***	2.83***	6.77***	4.69***
Adj. R-Squared	0.0666	0.0212	0.0881	0.0792	0.0791	0.0996	0.0621

Variables	(8)	(9)	(10)	(11)	(12)	Developing
GDP per capita	0.007	-0.002	-0.012	-0.008		-0.001
	(0.36)	(-0.12)	(-2.92)***	(-0.44)		(-0.61)
Young dependency ratio	-0.068	-0.076	-0.058	-0.054	-0.049	-0.039
	(-3.61)***	(-4.09)***	(-3.09)***	(-2.83)***	(-2.92)***	(-2.33)**
Old dependency ratio	0.145	0.150	0.141	0.160	0.131	0.270
	(4.02)***	(4.17)***	(3.65)***	(4.18)***	(4.07)***	(4.76)***
Life expectancy at birth	0.145	0.107	0.129	0.166		0.044
	(2.25)**	(2.65)***	(3.12)***	(4.01)***		(1.36)
Schooling years	0.006	0.005	0.012	0.009		0.023
	(0.69)	(0.64)	(1.48)	(1.10)		(3.12)***
Inflation rate	0.092	0.017	0.013	0.010	0.010	0.015
	(1.55)	(1.57)	(1.50)	(1.17)	(1.30)	(2.38)**
Financial depth	-0.010	-0.010	-0.021	-0.013	-0.012	0.010
	(-1.36)	(-1.37)	(-2.73)***	(-1.72)*	(-1.79)*	(1.38)
Political stability	-0.002					
	(-1.24)					
Government efficiency		0.003				
		(1.86)*				
Health expenditure per			0.012			
			(3.25)***			
Public health				0.027		
				(2.18)**		
Human development					0.146	
					(3.27)***	
Hausman Test	0.000	0.000	0.000	0.000	0.000	0.000
Observations	636	636	638	638	679	338
F-statistic	4.76***	5.02***	6.36***	5.58***	7.68***	6.16***
Adj. R- Squared	0.0630	0.0662	0.0821	0.0728	0.0591	0.0285

Note: '***', '**' and '*' respectively represent significant on the level of 1%, 5% and 10%.

Table 5 shows the results of regressions where we take insurance density as the insurance market measure. According to the Hausman test, we control both fixed time and country effects in the regressions expect for the one for human development index where involves a random effect.

There are obvious discrepancies between the results in Table 5 and Table 4. Given that insurance penetration and insurance density measure insurance market from different aspects, the discrepancies are acceptable.

Young dependency ratio is still a robust predictor. A 1% increase of it decreases insurance density by 1.6%. The coefficients on GDP per capita and schooling years are significantly positive. When these indicators increases 10%, insurance density respectively increases 9.3% and 12.7%. The secondary enrollment rate is also a robust explanatory factor when we substitute it for schooling years.

In the additional variables, the impacts of urbanization, government efficiency, health expenditure per capita and human development index are still significant. Unemployment rate and GINI index can provide some explanation for the changes of insurance density, though they are not robust for insurance penetration. Insurance density decreases 10.9% or 2.8% when there is a 10% increases in unemployment rate or GINI index. This corresponds with our assumptions above.

For the possible endogenous problem caused by schooling years, we take the first order lag of schooling years and compulsory education years as instruments and add them into the model. The reason of our choice is that compulsory education is a kind of enforced free education provided by governments. Countries with longer compulsory education years probably have longer average schooling years. And it can only affect the insurance sector through its impacts on education variables. The regression result with instruments in IV (1) of Table 5 shows that the coefficient on schooling years is still significant, which confirms the robustness of the former result.

Table 5. Social advance determinants of insurance density

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP per capita	0.927	1.054	0.871	0.855	1.072	0.897	0.983	0.983
	(23.33)***	(20.61)***	(21.64)***	(18.97)***	(18.95)***	(19.15)***	(25.08)***	(25.30)***
Young dependency ratio	-1.617	-0.306	-1.354	-2.731	-2.769	-1.525	-1.807	-1.824
	(-4.17)***	(-0.82)	(-3.54)***	(-5.64)***	(-3.20)**	(-3.73)***	(-4.69)***	(-4.69)***
Old dependency ratio	-0.354	0.922	-1.461	-0.685	2.125	2.041	-0.260	-0.236
	(-0.46)	(1.22)	(-1.88)*	(-0.90)	(1.21)	(2.28)**	(-0.34)	(-0.31)
Life expectancy at birth	-0.155	3.606	-0.262	0.615	-2.915	0.805	-1.651	-1.616
	(-0.18)	(3.42)**	(-0.31)	(0.71)	(-2.03)**	(0.88)	(-1.97)*	(-1.91)*
Schooling years	1.267		1.182	1.465	1.267	0.923	1.061	1.058
	(7.23)***		(6.87)***	(7.98)***	(3.78)***	(4.60)***	(6.15)***	(6.23)***
Inflation rate	0.272	0.416	0.200	0.167	0.106	-0.352	0.534	0.533
	(1.47)	(2.40)**	(1.10)	(0.88)	(0.43)	(-1.16)	(2.45)**	(2.44)**
Financial depth	0.029	-0.079	0.182	0.009	-0.143	-0.336	0.052	0.053
	(0.19)	(-0.516)	(1.20)	(0.06)	(-0.67)	(-2.15)**	(0.36)	(0.36)
Secondary enrollment		1.488						
		(4.90)***						
Urbanization			3.660					
			(5.42)***					
Unemployment rate				-1.089				
				(-2.68)***				
GINI index					-0.281			
					(-1.78)*			
Social security						0.461		
						(1.10)		
Rule of Law							0.006	
							(0.12)	
Political stability								0.004
								(0.13)
Hausman Test	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000
Observations	677	417	677	467	325	553	634	634
F-statistic	123.18***	93.15***	116.47***	113.02***	63.39***	77.40***	124.86***	124.87***
Adj. R-Squared	0.5865	0.6488	0.6055	0.6097	0.6577	0.5592	0.6387	0.6387

Variables	(9)	(10)	(11)	(12)	Developing	IV(1)[a]	IV(2)[b]
GDP per capit	0.959	0.461	0.898		0.820	0.968	0.926
	(24.62)	(5.28)*	(21.24)		(13.21)***	(24.80)*	(10.71)*
Young dependency	-1.919	-1.686	-1.454	-3.591	-1.094	-2.596	-0.010
	(-	(-	(-	(-	(-1.79)*	(-	(-0.01)
Old dependency	-0.185	-1.169	-0.367	-2.488	4.866	-0.186	4.754
	(-0.25)	(-1.40)	(-0.43)	(-	(2.39)**	(-0.24)	(1.72)*
Life expectancy at	-1.420	-0.123	1.014		-1.981	-1.008	-1.727
	(-1.72)*	(-0.13)	(1.11)		(-1.68)	(-1.20)	(-0.95)
Schooling years	1.026	1.271	1.198		1.824	0.522	3.56
	(6.09)*	(7.17)*	(6.56)*		(6.56)***	(2.36)**	(4.68)**
Inflation rate	0.532	0.332	0.255	-0.591	0.479	1.303	0.352
	(2.46)*	(1.85)*	(1.36)	(-	(2.12)**	(5.64)**	(0.74)
Financial depth	0.064	-0.283	-0.017	0.450	0.866	0.036	-2.951
	(0.45)*	(-1.75)*	(-0.10)	(2.47)*	(3.16)***	(0.25)	(-1.25)
Government	0.109						
	(3.28)*						
Health expenditure		0.459					
		(5.79)*					
Public health			0.479				
			(1.74)*				
Human development				24.815			
				(24.61)			
Hausman Test	0.000	0.000	0.000	0.731	0.000	0.000	0.000
Observations	634	636	636	677	336	609	292
F-statistic	128.59*	105.19*	96.26**	434.19*	34.45***	140.17**	8.70***
Adj. R-Squared	0.6455	0.5975	0.5759	0.7639	0.4530	0.6442	0.2288

Note: '*', '**' and '*' respectively represent significant on the level of 1%, 5% and 10%.**

a: Instruments sargan test（p-value）=0.410, AR(1)(p-value)= 0.24, AR(2)(p-value)= 0.09
b: Instruments sargan test（p-value）=0.224, AR(1)(p-value)= 0.58, AR(2)(p-value)= 0.57

When limited to developing countries, we find the impact of old dependency ratio becomes significant. Economic variables like inflation rate and financial depth are also robust positive promoters of insurance density. In developing countries, a 1% increase of schooling years, inflation rate or financial depth can bring a 1.8%, 0.48% or 0.87% increase of insurance density.

Previous researches have confirmed the relationship between financial depth and legal origins in countries (La Porta etc., 1997). Considering the interplay between insurance and financial development, we follow the previous practice by Beck and Webb in 2003 and take legal systems as instruments and add them into regression. The instrument group involves three dummy variables, British legal system, French legal system and Socialist legal system, which take the value 1 if a country belongs to a particular system. The result with instruments in IV (2) of Table 5 shows that the coefficient on financial depth is not significant any more. Then we can't conclude its impacts on insurance market development.

Cross-country analysis
To find the impacts of social advance factors on insurance market across countries, we set up cross-section model using the average values of the variables as samples during 2001 and 2015. In this part, we mainly test the relationships between insurance density and institutional variables which are generally time-invariant and special for every country.

Table 6 shows that countries with higher old dependency ratio, shorter life expectancy, lower inflation rate have both higher insurance penetration and insurance density. The coefficients of young dependency ratio are not significant any more. And the explanation of schooling years for insurance density is no longer robust. When limited the samples to developing countries, only life expectancy has a significant negative impact on insurance penetration, while insurance density can be only explained by GDP per capita.

In the additional variables, we find that rule of law and government efficiency might explain the discrepancies on insurance density among countries. Countries with higher legal and government efficiencies tend to have higher insurance consumption.

Table 6. Cross-section model regression results

Variables	Insurance		Insurance density				
	Full	Developing	Full	Developing	(1)	(2)	(3)
Constants	0.829 (2.75)***	1.044 (3.52)***	6.458 (0.99)	11.672 (1.42)	10.280 (1.70)	6.690 (0.99)	7.968 (1.47)
GDP per capit	0.010 (1.53)	0.002 (0.24)	1.066 (	0.815 (3.77)***	0.775 (4.82)***	1.052 (6.42)***	0.804 (6.05)***
Young	-0.017 (-0.33)	-0.070 (-1.03)	-0.661 (-0.59)	-1.371 (-0.72)	-0.163 (-0.16)	-0.623 (-0.54)	-0.181 (-0.19)
Old dependency	0.163 (2.18)**	-0.024 (-0.19)	4.091 (2.52)**	0.210 (0.06)	3.624 (2.44)**	4.082 (-2.49)**	2.902 (-2.11)**
Life expectancy	-0.217 (-	-0.245 (-3.47)***	-2.727 (-1.70)*	-3.390 (-1.73)	-3.029 (-2.07)**	-2.746 (-1.69)*	-2.575 (-1.93)*
Schooling years	0.019 (0.77)	0.014 (0.48)	0.453 (0.85)	0.371 (0.46)	0.399 (0.82)	0.433 (0.78)	0.458 (1.03)
Inflation rate	-0.266 (-2.11)**	-0.120 (-1.02)	-7.465 (-	-4.101 (-1.25)	-4.635 (-1.75)*	-7.338 (-2.57)**	-3.503 (-1.43)
Financial depth	0.025 (1.47)	0.055 (1.71)	0.683 (1.81)*	1.486 (1.66)	0.420 (1.18)	0.680 (1.78)	0.322 (0.99)
Rule of Law					0.534 (3.05)***		
Political stability						0.032 (0.17)	
Government							0.956 (
Observations	48	24	48	24	48	48	48
F-statistic	7.50***	3.77***	58.18***	4.47***	62.67***	49.68***	76.15***
Adj. R-Squared	0.4921	0.4578	0.8929	0.5137	0.9130	0.8923	0.9275

Note: '*', '**' and '*' respectively represent significant on the level of 1%, 5% and 10%.**

There are some differences between the results of panels and cross-section regressions. It's possibly because of the different methods and samples. The individual and time effects can be controlled in panels which can't be realized in cross-section models. The data used in cross-section model are averaged values which don't reflect the changes during time. Another reason is that social advance variables have different impacts on insurance measurements in horizon and vertical. For example, schooling years is a significantly positive predicator for insurance density in panels, but not in the cross-section model. It means that in the time-dimension, insurance consumption might increase with the education improvement in a country, though we can't conclude countries with longer average schooling years have higher insurance density.

CONCLUSION

In this paper, we study on the impacts of social advance on insurance market We use the data of 48 countries in the period of 2001-2015 and measure an insurance market with insurance penetration and insurance density for different perspectives. After the analysis on the results of both panel and cross-section models, we can draw the following conclusions.

1. Changes of demographic structure can significantly affect the insurance market. In the penal regressions, young dependency ratio has strong negative correlations with both insurance measurements. Insurance penetration can also be positively influenced by higher old dependency ratio and longer expected lives. The results of cross-section estimations show that the coefficients of old dependency ratio for both insurance measurements are positive, while the ones of life expectancy are both negative. We can say that countries with shorter lives tend to be more developed in insurance market. But for individual countries, long lives have positive meanings for their insurance markets from the vertical. Meanwhile, rising urbanization can also promote the development of insurance market.

2. Longer education years are associated with higher insurance consumption in the market. In the panel estimations, both schooling years and secondary enrollment rate can robustly explain for the changes of insurance measurements. And the impacts are more noticeable in developing countries, where both insurance measurements are positively associated with schooling years.

3. Income is an important determinant of insurance development. Higher GDP per capita is associated with higher insurance density in both panel and cross-section models. But its impact on insurance penetration is not verified. In developing countries, mild inflation has promoted their insurance markets, while high inflation rate block the development from the aspect of cross-section. Besides, financial depth has no significant impact on insurance measurements in both models, which may be because of the different financial regulation method and policies among countries.

4. There is notable relationship between institutional factors and insurance market. In the panel estimations, the higher the government efficiency is, the higher the insurance penetration and density would be. Rule of law is also confirmed to be significant in the cross-section analysis.

5. Optimizing medical conditions and higher medical expenditures can promote the increase of insurance consumption, reflected by both insurance penetration and insurance density.

After the above analysis, we know that many social development factors are exerting influence on the insurance sector, and different social advance level can explain for the discrepancies of insurance market development among countries. We are sure there's still great space for China insurance to grow. To transform from "a big insurance market" to a real powerful one and to make the market comprehensively safeguard the whole society, we have some suggestions:

Firstly, everything in the changing society are related and linked. China insurance industry should broaden their thoughts and coordinate with the steps of social development. Practitioners should pay attention to the movements of social advance, so that they can timely find the emerging needs, and then develop new products and new markets.

Secondly, with the speedy population aging in China, people's demands on deposit and endowment products stand out. For the old-age endowment insurance system is far from perfect now, the insurance industry should cooperate with social security department to deal with the elderly supporting problem while improving the system and making favorable policies.

Thirdly, rapid China economy development means more risks to cover. When the subsistence problem has been solved, the needs for protection and investment will increase with people's consuming capacity improving. The insurance industry should seize the opportunity by expanding the market and elevate service quality.

Fourthly, for the coverage the social medical insurance is limited, poverty caused by diseases become common in the past few years. So commercial health insurance can be supplements for social securities. The improvement of medical conditions will enhance people's attention to health care and their needs for health coverage will increase in the long term as well. China government should actively develop favorable policies for health insurance sector and attach more importance to it.

Fifthly, insurance market development requires good legal environment and regulation efficiency. Under the "rule of law" guideline of China, the judicial standard keeps improving. The authorities should actively increase their regulation ability to maintain the market order and guide the development of industry.

Finally, insurance companies should pay attention to market segmentation, and provide diverse choices for different customers. Because of the discrepancy on risk awareness

caused by different education backgrounds, companies should give more risk education on potential customers, which has great importance to the long term development of insurance market.

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