

Hello

- Thank you to the International Insurance Foundation for inviting me here today.
- In particular, I thank Robert Gibbons and Ian Webb.

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“Missing Markets: Why Isn’t the Whole World Insured?”

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Institutional Quality, Knightian Uncertainty, and Insurability

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Abstract

- Knightian uncertainty (ambiguity) implies presence of uninsurable risks. In the Knightian context, institutional quality may be a good indicator of uncertainty. This paper correlates non-life insurance penetration levels in 70 countries with income level, financial sector depth, country risk, a measure of cost of insurance, and the World Bank governance indexes. Low and high income countries and the MENA region are also examined.
- Overall, we find that institutional quality-transparency-uncertainty nexus is the dominant determinant of insurability across countries, surpassing the explanatory power of income level. Insurability is lower when governance is weaker. Institutional quality as it reflects on the level of uncertainty may be the “deeper” determinant of insurability.
- **The whole world may not be insured because of institutional weaknesses that undermine insurability.**

This paper's focus is on *non-life* insurance markets across a sample of 70 countries.

There is a strong correlation across countries between the level of insurance coverage and level of income (e.g., as measured by per capita income) (Outreville, 1990). Moreover, increasing insurance coverage may be correlated with higher growth (Ward and Zurbruegg, 2000). The main underlying factors that determine the level of insurance coverage across countries include income level, along with financial depth, cost (price) of insurance, and country risk. However, income levels across countries are significantly correlated with institutional quality, so institutional factors may be the underlying determinants of the level of insurability across countries.

Main Hypothesis

- **Institutional quality is a good indicator of the level of uncertainty and transparency and, therefore, insurability in a given country.**

What is Transparency?

- Webster's 1. *Quality or state of being transparent*
- What is transparent?
- Webster's 2. a. *free from pretense or deceit.* FRANK
- b. *easily detected or seen through:* OBVIOUS
- c. *readily understood:* CLEAR

Transparency Requires:

- **HONESTY**
- **TRUTHFULNESS**
- **TRUST**
- **EASY DISCOVERY**
- **LACK OF OBSCURITY**
- **ABSENCE OF AMBIGUITY**

How to Increase Transparency/Reduce Uncertainty?

- **Frank Knight (*Risk, Uncertainty and Profit*, 2002) examines “structures and methods for reducing uncertainty,” including increasing scientific knowledge and accumulation of data (e.g., actuarial data). Uncertainty is consolidated and its costs are diversified through integrated organizations and specialized markets, such as insurance markets.**
- **Consolidation, specialization, and generation and dissemination of data to enable systemic and scientific control of economic decisions are the main underlying characteristics that define robust market institutions (North 1991; North and Weingast, 1989).**

Theoretical Interpretation

- **Transparency is interpreted in the context of Knightian uncertainty (ambiguity), which implies that probabilities and associated payoffs for economic prospects are *not* known with precision.**

I.E. “smoky probabilities”

- **There is a critical link between greater institutional strength and less uncertainty.**

What Makes Uncertainty Higher?

- **In the absence of robust market institutions, uncertainty is higher.**
- **Higher uncertainty in a country implies lower insurability.**
- **Lower institutional quality implies lower transparency (higher uncertainty) and lower insurability.**
- **To the extent that income level in a country is correlated with the level of institutional quality and institutional quality reflects on the degree of uncertainty, institutional quality can be hypothesized to be the “deeper” determinant of insurability.**

How to Measure Transparency and Uncertainty?

Methods of Quantification are Needed

- Use of World Bank Governance Indexes (WBI) provided by the *World Bank Institute, Governance, Regulation and Finance Division* and use of overall county risk ratings.
- WBI's may be good indicators of Knightian uncertainty.
- WBI's are based on subjective evaluations of various aspects of governance (traditions and institutions by which authority in a country is exercised). County specific governance determines economic decisions.
- The institutional environment provides the decision framework, in terms of norms. These norms determine the rules of the game that guide procedural economic decisions.

Experimental Findings

- **The importance of ambiguity is further inspired by some important experimental findings at the individual level. Hogarth and Kunreuther (1992) and Kunreuther and others (1995) present evidence that insurance premiums are significantly higher when there is ambiguity about event (hazard) probabilities and magnitudes of associated losses.**

Insurance Market Failures – Developed Markets

- **There is considerable uncertainty regarding some contingencies to the extent that markets fail to provide adequate insurance coverage.**
- **For example, hurricanes, floods, earthquakes, tsunamis, terrorism, political instability.**
- **Even in actuarially sophisticated insurance decisions, some ambiguity remains because those decisions cannot be exhaustive to the extent that all possible contingencies are evaluated, including contingencies that are the products of a given institutional environment.**

Insurance Market Failures— Developing Markets

- **In developing countries, institutional weaknesses may also result in economic uncertainty, which may deter insurance market development and result in low insurance coverage.**

Major Contribution of this Paper

- **Examination of the institutional quality-transparency-uncertainty nexus to determine its significance as a predictor of non-life insurability.**
- **Our main finding is that this nexus is the dominant determinant of insurability across countries, surpassing the explanatory power of income level.**

The Data

- Level of Non-Life Insurance Penetration (NLP), provided by *Swiss Re Sigma Insurance Research*.

$$\text{NLP} = \text{gross premiums} / \text{GDP}$$

- Institutional Quality (WBI):
- Voice and Accountability. Captures political process aspects, civil liberties, political rights, citizen participation in government selection, independence of the media, media as a monitor for authority positions.
- Political Stability. Perceptions on likelihood of destabilization or overthrow of government, possibly by unconstitutional or violent means.

The Data (continued)

- Government Effectiveness. Captures quality of public service provision and the bureaucracy, civil servant competence, independence of civil service from political pressures, credibility of government's policy commitments.
- Regulatory Quality. Measures degree of market-unfriendly policies (I.e. price controls, inadequate bank supervision) and degree of excessive regulation.
- Rule of Law. Measures extent to which agents have confidence in and abide by society rules (incidence of crime, quality of judiciary, enforceability of contracts). Extent to which property rights are protected.

The Data (continued)

- Control of Corruption. Corruption indicates an exercise of public power for private gains. Measures: frequency of additional payments to get things done, corruption effects on business environment, grand corruption in political arena, tendency of elite forms to engage in state capture. Corruption indicates governance failures.
- Overall Index of WBI. Each WBI is averaged over time, then an overall average is obtained for each country.

The Data (continued)

- Overall Country Risk Rating (CORISK). Indicates *composite risk* by the *International Country Risk Guide*. Many of its components (i.e. political risk) consist of risks that are difficult, if not impossible, to quantify.
- Cost (Price) of Insurance (C/P). A proxy for the supply cost of insurance supplied by *Insurance Information and Statistics (ISIS) data base*.

C/P=non-life insurance claims/premiums

- Income Level (PCI). Real per capita income in 1995 U.S. constant \$. Source: IMF *International Financial Statistics*.
- Financial Sector Depth (M2/GDP). Same source as PCI.

Table 2. Sample countries: NLP, PCI, and V&A

	Non-life insurance penetration ¹	Per capita income ²	Voice and accountability index
1 Nigeria	1.38	254	16.90
2 Vietnam	0.49	328	8.28
3 Kenya	2.35	336	28.30
4 Bangladesh	0.20	344	38.60
5 India	0.59	422	60.83
6 Pakistan	0.41	503	19.23
7 Zimbabwe	2.29	640	24.00
8 China	0.76	702	10.38
9 Honduras	1.96	710	48.03
10 Syria	0.50	806	6.53
11 Sri Lanka	0.71	818	42.50
12 Ukraine	1.21	912	37.33
13 Indonesia	0.72	1,038	23.88
14 Egypt	0.51	1,121	24.53
15 Philippines	0.71	1,124	59.05
16 Romania	0.66	1,361	58.60
17 Morocco	1.99	1,363	34.70
18 Bulgaria	1.42	1,484	62.50
19 Algeria	0.55	1,546	14.60
20 Iran	0.66	1,573	21.70
21 El Salvador	1.11	1,707	51.10
22 Dominican Republic	1.74	1,793	54.88
23 Lithuania	1.15	2,007	72.48
24 Tunisia	1.55	2,253	25.70
25 Peru	0.69	2,285	40.83
26 Latvia	2.04	2,298	69.73
27 Russia	1.27	2,320	37.65
28 Colombia	1.80	2,350	38.33
29 Thailand	1.18	2,812	55.90
30 Lebanon	2.31	2,853	34.90
31 Turkey	0.94	2,958	31.20
32 Panama	2.67	3,145	64.33
33 Poland	1.79	3,270	80.13
34 Venezuela	1.84	3,440	47.30
35 Mexico	0.93	3,491	50.63
36 South Africa	2.98	3,950	72.65
37 Slovak Republic	1.84	3,958	68.55
38 Brazil	1.73	4,500	61.53
39 Malaysia	2.08	4,528	44.88
40 Trinidad and Tobago	1.94	4,720	68.78

**Table 2. Sample countries: NLP, PCI, and V&A
(concluded)**

	Non-life insurance penetration ¹	Per capita income ²	Voice and accountability index
41 Hungary	1.61	4,839	83.15
42 Chile	1.28	4,989	72.78
43 Czech Republic	2.30	5,204	78.63
44 Oman	0.81	5,783	29.03
45 Saudi Arabia	0.50	6,854	12.23
46 Argentina	1.46	7,883	60.25
47 South Korea	3.19	8,378	68.25
48 Malta	2.40	9,325	89.25
49 Bahrain	1.65	10,443	19.13
50 Slovenia	3.52	10,482	77.10
51 Taiwan	2.17	12,916	69.73
52 Cyprus	2.02	12,923	80.85
53 Kuwait	0.62	14,847	42.43
54 New Zealand	4.45	17,195	95.45
55 U.A.E.	1.13	18,083	30.98
56 United Kingdom	3.67	20,848	93.10
57 Canada	3.68	21,144	91.00
58 Australia	3.54	22,165	97.58
59 Hong Kong	1.31	23,118	50.15
60 Euro Zone ³	3.06	24,764	89.75
61 Singapore	1.26	25,321	57.40
62 Qatar	1.54	27,917	27.30
63 Iceland	2.85	28,643	93.78
64 Sweden	2.20	28,910	97.93
65 United States	4.73	29,642	91.30
66 Norway	2.36	36,083	98.58
67 Denmark	2.55	36,346	98.83
68 Japan	2.38	43,535	79.28
69 Switzerland	4.25	44,978	98.85
70 Luxembourg	2.70	49,643	92.45
Simple averages	1.78	9,875	55.40

Sources: Swiss Re SIGMA Insurance Research; IFS; World Bank.

¹ Defined as gross premiums as a percentage of GDP;
1994-2003 simple averages.

² In US\$ in 1995 prices; 1994-2002 simple averages

³ Countries that adopted the euro; treated as a separate country.

The Model

- We regress:

$$NLP = f(PCI, CORISK, C/P, M2/GDP, WBI),$$

where *NLP*: non-life insurance gross premiums in percent of GDP (penetration) (*Swiss Re*); *PCI*: real per capita income in 1995 US\$ (*IFS*); *CORISK*: Compound country risk (*International Country Risk Guide*); *C/P*: Gross claims-to-premiums (*ISIS*), proxy for cost of insurance; *M2/GDP*: proxy for financial depth (*IFS*); *WBI*: World Bank institutional quality indexes; **Sample size**: 70 countries.

The Model, Continued

- All variables are **standardized** (zero mean, unit variance);
 - $V_i = (X_i - \text{sample mean}) / \text{Sample standard deviation}$
- The variables are originally reported on different scales. By standardizing, we convert them to comparable scales. Thus, we can compare variables in terms of their significance in predicting the insurance penetration levels across countries.

Results

- Table 1:
- ? Regression 1: V&A is three times more powerful in predicting NLP as compared to PCI.
- ? Regression 2: Overall WB index is more than three times more powerful in predicting NLP than PCI.
- ? Regression 3: V&A is three times more powerful in predicting NLP as compared to PCI.

Results

- Table 1: ? Regression 6: Regulatory quality explains more than PCI
- Table 2: ? PCI, CORISK and WB are highly cross-correlated. We therefore first exclude PCI from the regressions to explore the predictive power of the remaining variables (Regressions 1, 2 3, 6). We compare those results to the regression when PCI is included but WB indexes are dropped (Regression 9). We find that those WB indexes are more powerful predictors of NLP than PCI.

Results

- Table 3: We then exclude PCI and CORISK from the regressions and run NLP on WB indexes and the remaining variables (Regressions 1-8). In turn, we exclude WB indexes and run NLP only on PCI and only on CORISK (Regressions 9 and 10). We find that all WB indexes are at least as powerful or more powerful predictors of NLP than PCI or CORISK.

Policy Implications

- **Insurance market development should be a priority in the broad policy of promoting financial sector development.**
- **The whole world may not be insured because of institutional weaknesses that undermine insurability.**
- **Lower uncertainty due to higher insurability is likely to induce higher domestic and foreign investment and higher economic growth.**
- **Life insurance-institutional quality linkages should also be explored.**

Future Research

- **Examine plausible correlations between investment flows, Knightian uncertainty, and the level of insurance coverage across countries. Investment flows are key to economic growth.**
- **What does economic growth require?**
- **Opportunity**
- **Financial capital**
- **Technical Knowledge**
- **Insurance (Mitigation of Risks)**

The End

- Thank you for your kind attention.
- Questions?

Table 1. Non-Life Penetration Regressions (Sample Size = 70)

	1			2			3			4		
	Coeff.	t-value	P value	Coeff.	t-value	P value	Coeff.	t-value	P value	Coeff.	t-value	P value
Intercept	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00
Real per capita income (PCI)	0.21	1.50	0.14	0.22	1.50	0.14	0.21	1.56	0.12	0.26	1.65	0.10
M2/GDP	-0.30	-1.17	0.25	-0.43	-1.71	0.09	-0.23	-1.46	0.15	-0.05	-0.20	0.84
Composite risk (CORISK)	0.15	1.53	0.13	0.04	0.37	0.71	0.14	1.52	0.13	0.05	0.46	0.65
Non-life claims/premiums (C/P)	0.20	1.96	0.05	0.17	1.60	0.11	0.19	1.98	0.05	0.25	2.22	0.03
Overall index				0.77	3.16	0.00						
Voice and accountability	0.61	4.13	0.00				0.65	5.46	0.00			
Political stability	0.15	0.69	0.49							0.28	1.27	0.21
Government effectiveness	0.00	-0.01	0.99									
Regulatory quality	0.06	0.28	0.78									
Rule of law	-0.29	-0.71	0.48									
Control of corruption	0.20	0.48	0.63									
Adjusted R ²	0.52			0.43			0.55			0.36		
Multiple R ²	0.77			0.69			0.76			0.64		
	5			6			7			8		
	Coeff.	t-value	P value	Coeff.	t-value	P value	Coeff.	t-value	P value	Coeff.	t-value	P value
Intercept	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00
Real per capita income (PCI)	0.27	1.73	0.09	0.26	1.72	0.09	0.27	1.68	0.10	0.26	1.62	0.11
M2/GDP	0.01	0.05	0.96	-0.06	-0.30	0.76	0.14	0.59	0.56	0.03	0.15	0.88
Composite risk (CORISK)	0.01	0.09	0.93	0.03	0.30	0.77	0.03	0.24	0.81	0.02	0.21	0.84
Non-life claims/premiums (C/P)	0.21	1.84	0.07	0.22	1.98	0.05	0.23	1.97	0.05	0.21	1.84	0.07
Government effectiveness	0.24	1.00	0.32									
Regulatory quality				0.36	2.30	0.02						
Rule of law							0.08	0.37	0.71			
Control of corruption										0.22	1.00	0.32
Adjusted R ²	0.35			0.39			0.34			0.35		
Multiple R ²	0.63			0.66			0.62			0.63		

Source: Authors' estimates

Table 2. All Sample Countries: Non-Life Penetration Regressions Excluding PCI

<i>Sample size = 70</i>												
	1			2			3			4		
	Coeff.	t-value	P value	Coeff.	t-value	P value	Coeff.	t-value	P value	Coeff.	t-value	P value
Intercept	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00
M2/GDP	-0.20	-0.78	0.44	-0.31	-1.29	0.20	-0.10	-0.73	0.47	0.10	0.42	0.68
Composite risk (CORISK)	0.16	1.59	0.12	0.04	0.40	0.69	0.15	1.57	0.12	0.06	0.51	0.61
Non-life claims/premiums (C/P)	0.23	2.25	0.03	0.20	1.90	0.06	0.22	2.33	0.02	0.29	2.62	0.01
Overall index				0.81	3.31	0.00						
Voice and accountability	0.63	4.21	0.00				0.67	5.57	0.00			
Political stability	0.16	0.75	0.46							0.32	1.39	0.17
Government effectiveness	-0.04	-0.14	0.89									
Regulatory quality	0.05	0.24	0.81									
Rule of law	-0.27	-0.65	0.52									
Control of corruption	0.24	0.56	0.58									
Adjusted R ²	0.51			0.42			0.54			0.34		
Multiple R ²	0.76			0.67			0.75			0.62		
	5			6			7			8		
	Coeff.	t-value	P value	Coeff.	t-value	P value	Coeff.	t-value	P value	Coeff.	t-value	P value
Intercept	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00
M2/GDP	0.20	0.88	0.38	0.12	0.70	0.49	0.29	1.33	0.19	0.18	0.83	0.41
Composite risk (CORISK)	0.01	0.13	0.90	0.04	0.33	0.74	0.03	0.25	0.81	0.02	0.22	0.82
Non-life claims/premiums (C/P)	0.26	2.22	0.03	0.26	2.37	0.02	0.27	2.29	0.03	0.25	2.15	0.04
Government effectiveness	0.24	1.01	0.32									
Regulatory quality				0.37	2.33	0.02						
Rule of law							0.13	0.56	0.58			
Control of corruption										0.27	1.18	0.24
Adjusted R ²	0.33			0.37			0.32			0.34		
Multiple R ²	0.61			0.64			0.60			0.61		
	9											
	Coeff.	t-value	P value									
Intercept	0.00	0.00	1.00									
Real per capita income (PCI)	0.28	1.75	0.09									
M2/GDP	0.20	1.23	0.22									
Composite risk (CORISK)	0.03	0.30	0.77									
Non-life claims/premiums (C/P)	0.24	2.15	0.04									
Adjusted R ²	0.35											
Multiple R ²	0.62											

Source: Authors' estimates

Table 3. All Sample Countries: Non-Life Penetration Regressions Excluding PCI, CORISK

<i>Sample size = 70</i>													
	1			2			3			4			
	Coeff.	t-value	P value	Coeff.	t-value	P value	Coeff.	t-value	P value	Coeff.	t-value	P value	
Intercept	0.00	0.08	0.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	
M2/GDP	-0.20	-0.78	0.44	0.01	0.13	0.89	0.12	1.40	0.17	0.07	0.68	0.50	
Non-life claims/premiums (C/P)	0.16	1.59	0.12	0.20	1.88	0.06	0.20	2.22	0.03	0.30	2.84	0.01	
Overall index				0.53	4.59	0.00							
Voice and accountability	0.61	4.16	0.00				0.61	6.78	0.00				
Political stability	0.08	0.42	0.67							0.40	3.53	0.00	
Government effectiveness	-0.10	-0.33	0.74										
Regulatory quality	0.06	0.28	0.78										
Rule of law	-0.28	-0.68	0.50										
Control of corruption	0.21	0.50	0.62										
Adjusted R ²	0.51			0.41			0.54			0.35			
Multiple R ²	0.75			0.66			0.75			0.61			
	5			6			7			8			
	Coeff.	t-value	P value	Coeff.	t-value	P value	Coeff.	t-value	P value	Coeff.	t-value	P value	
Intercept	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	
M2/GDP	0.02	0.17	0.86	0.06	0.57	0.57	0.04	0.39	0.70	0.04	0.36	0.72	
Non-life claims/premiums (C/P)	0.26	2.24	0.03	0.28	2.64	0.01	0.27	2.29	0.02	0.25	2.18	0.03	
Government effectiveness	0.42	3.27	0.00										
Regulatory quality				0.45	4.02	0.00							
Rule of law							0.38	2.95	0.00				
Control of corruption										0.42	3.35	0.00	
Adjusted R ²	0.33			0.38			0.32			0.34			
Multiple R ²	0.60			0.64			0.59			0.61			
	9			10									
	Coeff.	t-value	P value	Coeff.	t-value	P value							
Intercept	0.00	0.00	1.00	0.00	0.00	1.00							
Real per capita income (PCI)	0.41	3.49	0.00										
M2/GDP	0.07	0.69	0.49	0.04	0.11	0.34							
Composite risk (CORISK)				0.40	3.22	0.00							
Non-life claims/premiums (C/P)	0.27	2.41	0.02	0.29	2.56	0.01							
Adjusted R ²	0.35			0.33									
Multiple R ²	0.61			0.60									

Source: Authors' estimates

