Discussion of:

Time-Varying Ambiguity and Asset Pricing Puzzles

by Zhan Shi

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The paper

Paper studies...

- Linkages between uncertainty on economic prospects (ambiguity) and a set of asset pricing puzzles (e.g. equity premium and credit risk premium).
- Assumption that ambiguity might not be constant over time and co-varies with financial markets.

Empirical findings suggest that...

- Shocks to the level of ambiguity might represent an extra-source of non-diversifiable risk which commands a premium on itself.
- Time-varying nature of uncertainty reflects in the price-dividend ratio generating long-run returns predictability.

Major comments - Setup of the Economy

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  - If A_t represents objectively available information, the maxmin rule has an extreme, rather paranoid, nature.
  - The measure A_t must not reflect the set of all logically possible priors (see e.g. Epstein and Schneider 2010, Marinacci and Gilboa 2011).

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- Does A_t only reflect objective information? How does the set of priors evolves? Density generator?
  - If A_t represents objectively available information, the maxmin rule has an extreme, rather paranoid, nature.
  - The measure A_t must not reflect the set of all logically possible priors (see e.g. Epstein and Schneider 2010, Marinacci and Gilboa 2011).
- What is the role of ambiguity attitude?
  - Multiple-priors setting grounds on "revealed" preferences.
  - Attitude to uncertainty and information are inextricably intertwined in $(-A_t, A_t)$.
  - Infinite ambiguity averse investors?

Major comments - A New Measure of Ambiguity?

On the empirical side...

- Does the measure proposed effectively add anything to alternative existing proxies?

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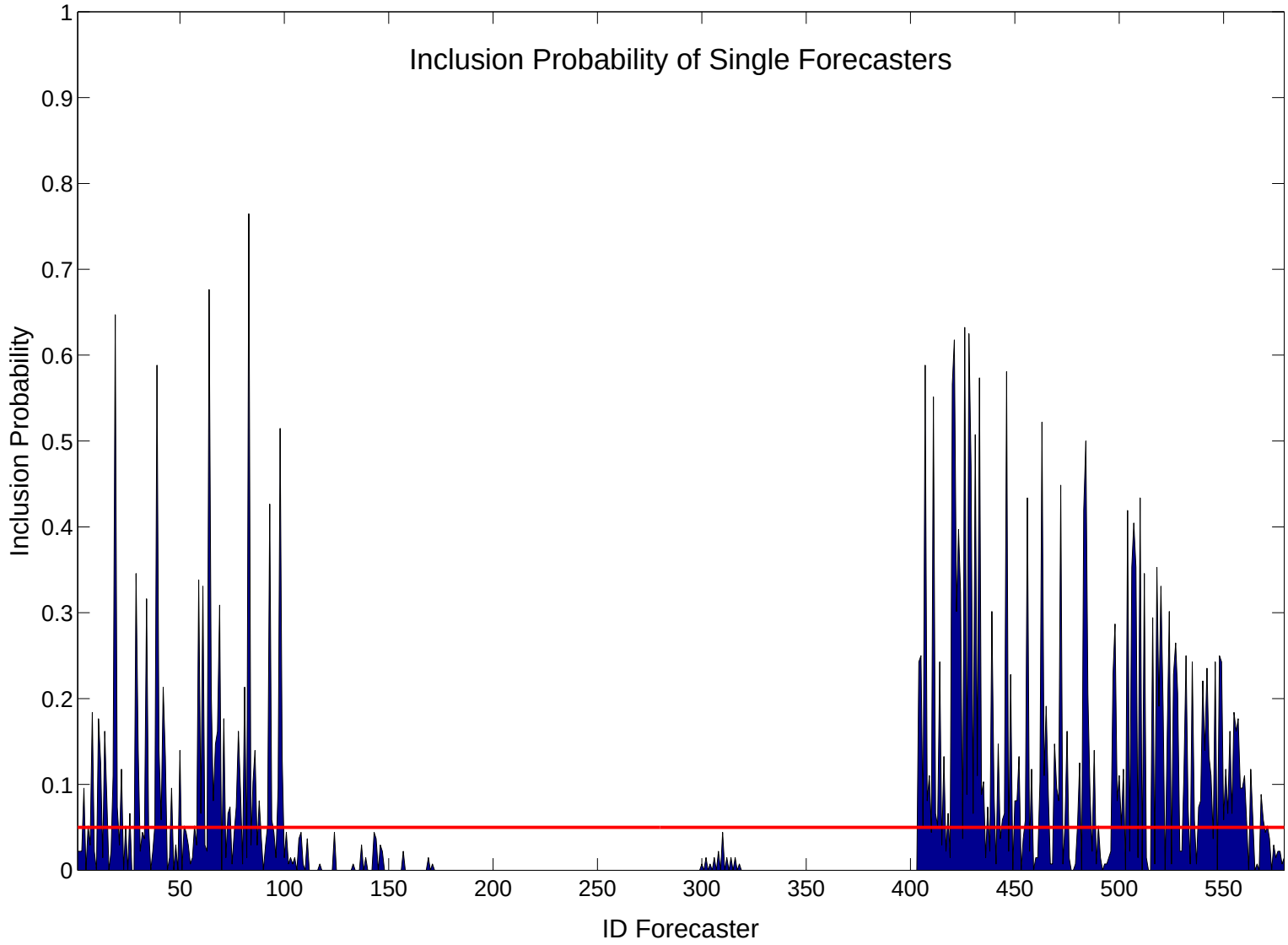

Major comments - A New Measure of Ambiguity?

$$X_{t+1} = \alpha + \beta A_t + \sigma \epsilon_{t+1} \qquad \epsilon_{t+1} \sim N(0,1)$$

Sample 1992Q1 - 2010Q4				
X_{t+1}	β	t-stat	Adj R^2	OOS R^2
$CRSP_{vw}$	0.829	1.134	0.009	0.009
CS_{Aaa}	0.312	3.065	0.119	0.131
CS_{Baa}	0.601	3.461	0.228	0.238
$rx(2)$	0.592	2.821	0.085	0.097
$rx(3)$	1.127	3.142	0.080	0.092
$rx(4)$	1.471	3.201	0.068	0.080
$rx(5)$	1.802	3.271	0.065	0.078

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$$X_{t+1} = \alpha + \beta A_t + \gamma CP_t + \sigma \epsilon_{t+1} \qquad \epsilon_{t+1} \sim N(0,1)$$

Sample 1992Q1 - 2010Q4						
X_{t+1}	β	t-stat	γ	t-stat	Adj R^2	OOS R^2
CS_{Aaa}	0.306	3.059	0.026	0.481	0.111	0.135
CS_{Baa}	0.603	3.451	-0.015	-0.232	0.228	0.238
$rx(2)$	0.481	2.467	0.324	2.212	0.153	0.176
$rx(3)$	0.973	2.771	0.453	1.539	0.117	0.141
$rx(4)$	1.374	2.668	0.529	1.273	0.101	0.125
$rx(5)$	1.689	2.702	0.575	1.212	0.087	0.112

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On the theoretical side...

- What kind of information is used to build the Blue Chip Financial Forecasts?
  - Monthly frequency would dilute/exclude official info on economic fundamentals (e.g. Real GDP).
  - External information (e.g. financial) to build forecasts do not make the model internally consistent with a general equilibrium setting.
  - How does a constant size of panelists can be reconciled with the changing size of the prior set? No ambiguity attitudes?

Minor comments - Pricing implications

- **Real pricing kernel...**

$$\frac{dM_t}{M_t} = -r_t dt - \left(\gamma\sigma_c + \frac{A_t}{\sigma_c}\right) dB_{C,t} + (1-\theta)\,\eta_1\sigma_a^2 A_t dB_{A,t}$$

$$r_t = \rho_0 + \rho_1 A_t \qquad \rho_1 = -\frac{1}{\psi} + \frac{1}{2}(\theta-1)\,\eta_1^2\sigma_a^2$$

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  - Does time-varying ambiguity has a role above and beyond investor preferences?

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- **Firms' Capital Structure...**

$$\frac{d\delta_{j,t}}{\delta_{j,t}} = \frac{dO_t}{O_t} + \sigma_j dB_{j,t}$$

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$$\frac{d\delta_{j,t}}{\delta_{j,t}} = \frac{dO_t}{O_t} + \sigma_j dB_{j,t} \qquad \Longrightarrow \qquad \beta_j \frac{dO_t}{O_t} + \sigma_j dB_{j,t}$$

  - Same exposure to systematic risk across firms?

Minor comments - Empirical results

Statistical significance of simulated returns...

- Confidence intervals on simulated moments?

Table 8: Simulated and Sample Moments of Equity Return and Risk-Free Rate

	Data		Constant Ambiguity		Time-Varying Ambiguity		
	Portfolio	Individual	Unlevered	Levered	Unlevered	Portfolio	Individual
$E(r_{e,t} - r_t)$	6.13	8.98	1.11	2.09	4.13	5.94	7.81
$\sigma(r_{e,t})$	16.58	32.97	1.18	2.67	6.72	12.39	26.63
$E(r_{e,t} - r_t)/\sigma(r_{e,t} - r_t)$	41.49	28.33	93.97	78.62	73.75	48.60	29.24
$E(r_t)$	1.21		1.70			1.18	
$\sigma(r_t)$	1.18		0			0.92	

Final thoughts

Further suggestions...

- Empirical evidence should focus on credit premium and possibly also assess the contribution of time-varying ambiguity in isolation.
- It would be probably even more interesting to investigate time-varying ambiguity aversion and its asset pricing implications.

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To conclude...

- Well executed paper. The idea that uncertainty on economic prospects (ambiguity) might be time-varying is promising and interesting.
- The model calibration and empirical results seem to support this view.