Asset Pricing when "This Time Is Different"

Pierre Collin-Dufresne
Michael Johannes
Lars Lochstoer

Discussion by Nicolae Gârleanu
UC Berkeley-Haas, NBER, and CEPR

Macro-Finance Society
Chicago, May 2014

Motivation

Part I:

- Learning can have sizable AP implications with EZ preferences
  - "long-run-risk" logic at individual-investor level
  - persistent, variable updates to beliefs
  - preference for early resolution of uncertainty
- Evidence that learning is "imperfect"
  - Malmendier and Nagel (2011): over-weight personal experiences $\Rightarrow$ large updates to beliefs

Motivation

Part I:

- Learning can have sizable AP implications with EZ preferences
  - "long-run-risk" logic at individual-investor level
  - persistent, variable updates to beliefs
  - preference for early resolution of uncertainty
- Evidence that learning is "imperfect"
  - Malmendier and Nagel (2011): over-weight personal experiences $\Rightarrow$ large updates to beliefs

Part II:

- Agents of different ages coexist
  - Do their beliefs average out?
  - Does risk-sharing reinforce the risk faced by agents?

Motivation

Part I:

- Learning can have sizable AP implications with EZ preferences
  - "long-run-risk" logic at individual-investor level
  - persistent, variable updates to beliefs
  - preference for early resolution of uncertainty
- Evidence that learning is "imperfect"
  - Malmendier and Nagel (2011): over-weight personal experiences $\Rightarrow$ large updates to beliefs

Part II:

- Agents of different ages coexist
  - Do their beliefs average out?
  - Does risk-sharing reinforce the risk faced by agents?

Part III:

- What if there is investment?

“This Time is Different”: Malmendier and Nagel

- Not Bayesian updating
- Quite strong emphasis on recent observations (returns, inflation)
- No weight on history before agent's birth
- Malmendier and Nagel (2011) – weight on shock l quarters ago for age a:

$$w_{a,l} = \frac{l^\lambda}{\sum_{l'=0}^{a-1} l'^\lambda}, \qquad \lambda \approx 1.5$$

- Malmendier and Nagel (2013) – weight on latest shock:

$$\gamma_a = \frac{\theta}{a}, \qquad \theta \approx 3.$$

- Bayesian updating would require $\lambda = 0$ ($\theta = 1$)

"This Time is Different": CJL

- Model:

$$m_{t+1} = (1 + A_t)^{-1} m_t + A_t (1 + A_t)^{-1} \Delta c_t$$
$$A_{t+1} = A_t (1 + A_t)^{-1}, \qquad A_0 = k A_{2T}$$

- Bayesian updating $\Rightarrow$ equal weighting of all experienced data points
- History before agent's birth is downweighted
- Every new cohort takes the posterior mean of previous generation as its prior mean, but with higher variance ($k = 5$ times higher)
  - Captures the notion of overweighting recent experiences
  - But less than Malmendier-Nagel
- Relevant observations for asset pricing:
  - CJL innovations permanent, MN not
  - CJL weight on latest shock drops faster with age (both start at 3%, end at 0.5% vs 1%)
  - CJL heterogeneity in updating across agents higher

Preferences, Demographics, Dividends

- Two cohorts alive at any point in time
  - Each lives $2T$ periods
  - Age difference always T
- EZ preferences with perfect bequest $\Rightarrow$ two (representative) agents that, every $2T$ quarters, experience a dramatic loss of confidence in their understanding of the world
  - Stochastic discount factor

$$SDF_{t+1} \propto C_{t+1}^{-\gamma} \left(\frac{W_{t+1}}{C_{t+1}} \right)^{-\frac{\gamma - \frac{1}{\psi}}{1 - \frac{1}{\psi}}}$$

- Usual (Bansal-Yaron) parameters
- "Leverage": $\beta_{\Delta d, \Delta c} = 3$

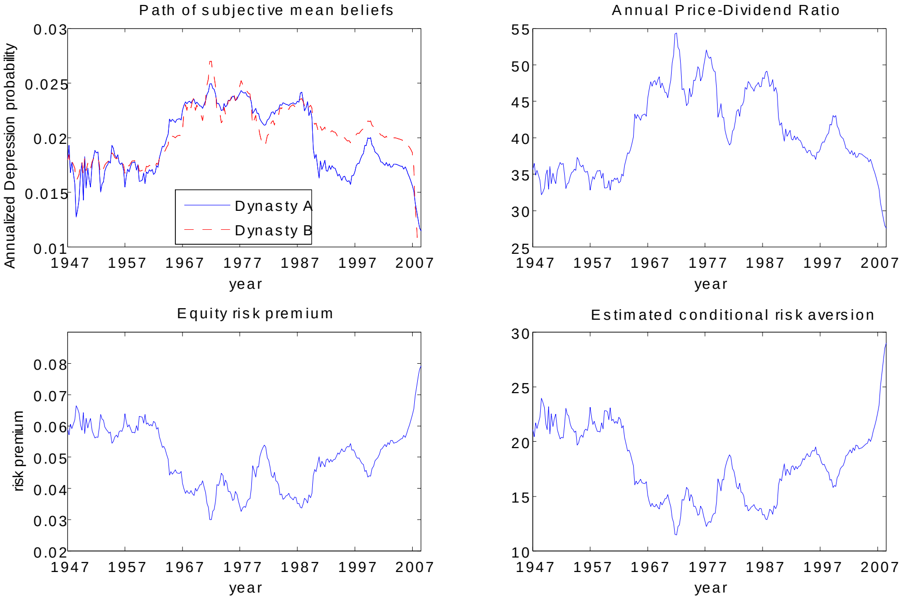
Results

- Basically, it "works" (both versions) wrt AP moments
- Insights into the effect of heterogeneity in a TTID world
  - Different beliefs ⇒ excess volatility
  - Young and old update towards the same target, young more aggressively ⇒ Young perceive higher risk (LRR)
  - Excess volatility through risk-sharing can be overturned in some states: more optimistic agent may face more risk, therefore still seek insurance
  - Average effect is to increase excess volatility: analogous to heterogeneous risk aversion
- Predictions for risk-sharing patterns across cohorts
- Nice way to look at the predictions, given complexity: trace out the effects of the actual consumption-shock path
  - A drawback: Few (two) cohorts ⇒ discontinuities
    - Average over different possibility of ages at time 0
    - Krussel-Smith?
- One wish: Separate effects of TTID and heterogeneity

Results

		'This Time is Different'		Known mean
	Data 1929 – 2011	$EZ:\ \gamma = 10$ $\psi = 1.5,\ \beta = 0.994$	$Power:\ \gamma = 10$ $\psi = 1/10,\ \beta = 0.994$	$EZ:\ \gamma = 10$ $\psi = 1.5,\ \beta = 0.994$
$E_T\left[r_m - r_f\right]$	5.1	5.2	0.1	1.5
$\sigma_T\left[r_m - r_f\right]$	20.2	16.6	10.5	12.9
$SR_T\left[r_m - r_f\right]$	0.25	0.31	0.01	0.12
$E_T\left[r_f\right]$	0.86	2.4	18.7	3.4
$\sigma_T\left[r_f\right]$	0.97	0.3	2.6	0.0
$\sigma_T\left[M_{t+1}\right]/E_T\left[M_{t+1}\right]$	-	0.51	0.20	0.27
$\gamma \times \sigma_T\left[\Delta c_{t+1}\right]$	-	0.27	0.27	0.27
$E_T\left[\Delta c_{t+1}\right]$	1.8%	1.8%	1.8%	1.8%
$\sigma_T\left[\Delta c_{t+1}^{TA}\right]$	2.2%	2.2%	2.2%	2.2%

Historical Path

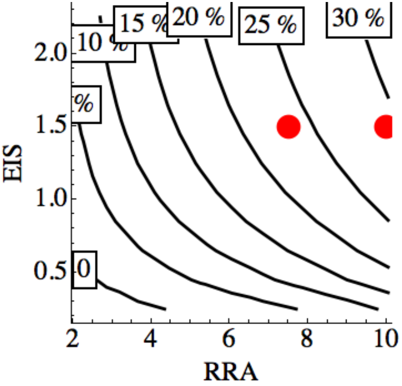


Investment Economy

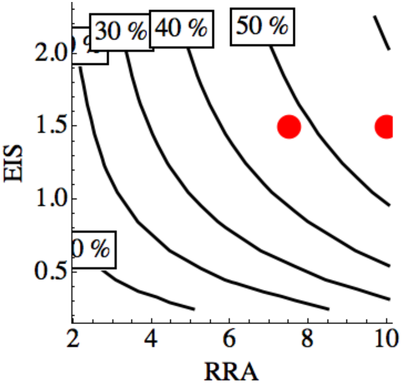
- Cobb-Douglas with (asymmetric) capital adjustment costs
- Mean TFP growth not known by agents
- Results presented for TTID (two-dynasty) economy
- Main observation:
  - TTID pushes equity volatility up to 6% (cf. Kaltenbrunner-Lochstoer)
  - Explanation: Aggressive updating of beliefs allows for higher adjustment costs, more variable q

Too Much Preference for Early Resolution of Unc-ty?

Experiment of Epstein et al (2014): What percentage of consumption would a Bansal-Yaron investor forego to have **all** consumption uncertainty resolved at time 1?



(a) Timing Premium constant volatility



(b) Risk Premium constant volatility

Some Final Comments

- "Pain":
  - Do we really have to match AP moments?
  - How to judge whether increment in realism is worth that in complexity?
  - E.g., how many cohorts, what kind of learning, learning about what
- Objective:
  - Modus operandi: "best" parameters that match AP moments
  - How do we judge how good of a success $\gamma = 10$, $\psi = 1.5$ is?
  - Perhaps concentrate on satisfactory parameters and see how large AP effects. The model is bound to miss relevant channels anyway.
- Plausibility:
  - Young behave as more risk averse because they're worried about learning something big and bad about their consumption trend
- Learning:
  - Are the findings of Malmendier and Nagel good descriptions of **representative** agent in a cohort?
  - Maybe interaction btw a rational agent and a TTID one would actually lead to similar results?

Conclusion

- Reasonable motivation; from the beginning a quantitative question
- Concern for calibrating to data where available
- Channel can certainly generate first-order effect
- Paper couched in terms of TTID, but heterogeneity likely to be important. Authors can help quantify and clarify this point.
- Production: tighten the message?
- Lots of stuff, great pedagogical value