Current Research in Institutional Investor Behavior at State Street Associates

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Six key aspects of behavior are useful for predicting future institutional demand and market outcome

1. Flows

2. Holdings

3. Borrowings

4. Demand v. supply

5. Agreement

6. Past performance and risk appetite

7. Overcrowding

What is useful to know today to predict future institutional behavior?

6. Changes in risk appetite, past performance, panic, and BEER

Changes in risk appetite and past performance:
Some background

- Classical theory:
  - Efficient markets and rational investors whose portfolios reflect expected end-of-period opportunity sets
    - Updates of these expectations evolve randomly
  - None of these should matter:
    - Past performance, funding constraints, stop loss trades, reputation and compensation structures, hedging activity, wealth levels, momentum
- Behavioral theory:
  - Loss aversion and the disposition effect (Kahneman and Tversky, 1979)
    - Retail investors (Odean, 1998, and Feng and Seasholes, 2005)
    - CBOT traders (Coval and Shumway, 2005, and Locke and Mann, 2005)
    - Retail and institutional (Grinblatt and Keloharju, 2001)
  - Dynamic loss aversion (Barberis, Huang, and Santos, 2007)
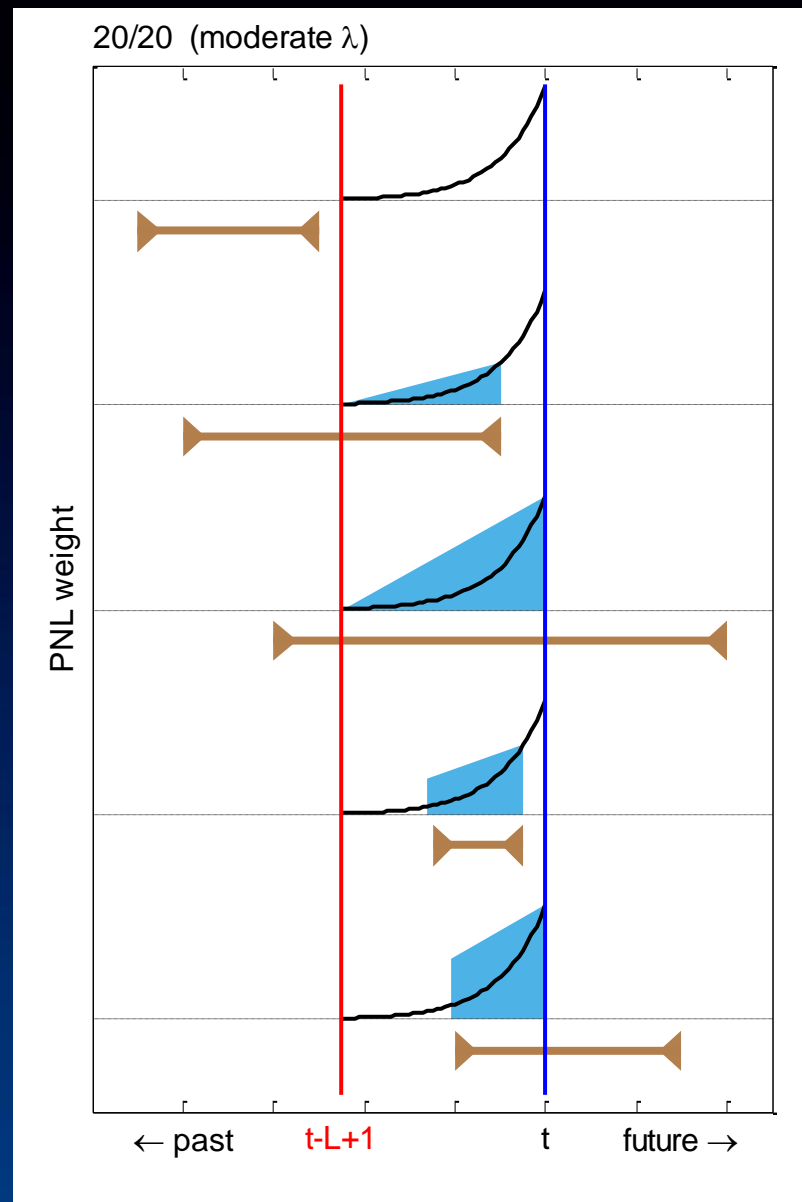   - Institutional investors (O'Connell and Teo, 2009)

PNL / Beer Correspondence

- **In addition, the behavioral importance of a given contract's prior PNLs may further diminish with time**

$$Beer_{i,j,t} = s^{i/\$} - \frac{\sum_{j=1}^{J(k,t,L)} \sum_{t'=t_0+1}^{t} w_{t-t',j} h_{i,j,t'-1} \ln\left(\frac{f_{i,t'}}{f_{i,t'-1}}\right)}{\sum_{j=1}^{J(k,t,L)} \sum_{t'=t_0+1}^{t} w_{t-t',j} h_{i,j,t'-1}}$$

$$\text{where} \quad w_{t-t',j} = \left(\frac{t'-t+L}{L^2(L+1)}\right) \cdot \left(\frac{1}{2}\right)^{\lambda(t-\min(t,t_1(j))-1)} \quad \text{for } t' \ge t_0(j)$$

- **Shaded areas represent weights over past pnls**

- **Rate of decline in importance of prior day pnl is assumed constant across contracts and linear**

20/20 (moderate λ)

PNL weight

$\leftarrow$ past   t-L+1   t   future $\rightarrow$

PNL Variables

Description	Name	Expression
• Change in **position level** PNL for currency *i* and portfolio *j*:	PNL fc/f	$\dfrac{\sum_{t'} w_{t-t'} h_{i,k,t'-1} \ln\left(\dfrac{f_{i,t'}}{f_{i,t'-1}}\right)}{\sum_{i}\sum_{t'} w_{t-t'} \left\| h_{i,k,t'-1}\right\|}$
• Change in **currency level** PNL across portfolios:	PNL c/.	$\dfrac{\sum_{k}\sum_{t'} w_{t-t'} h_{i,k,t'-1} \ln\left(\dfrac{f_{i,t'}}{f_{i,t'-1}}\right)}{\sum_{i}\sum_{k}\sum_{t'} w_{t-t'} \left\| h_{i,k,t-1}\right\|}$
• Change in **fund level** PNL across currencies:	PNL f/f	$\dfrac{\sum_{i}\left(\sum_{t'} w_{t-t'} h_{i,k,t'-1} \ln\left(\dfrac{f_{i,t}}{f_{i,t'-1}}\right)\right)}{\sum_{i}\sum_{t'} w_{t-t'} \left\| h_{i,k,t'-1}\right\|}$
• Change in **universe** PNL across funds and currencies:	PNL ./.	$\dfrac{\sum_{i}\sum_{k}\sum_{t'} w_{t-t'} h_{i,k,t'-1} \ln\left(\dfrac{f_{i,t'}}{f_{i,t'-1}}\right)}{\sum_{i}\sum_{k}\sum_{t'} w_{t-t'} \left\| h_{i,k,t'-1}\right\|}$

Which PNL losses are the most important drivers for changing risk?

- **Q: Do one of these frames dominate the other if they compete?**

| Risk Changes		PNL of Currency / fund		PNL of Fund		PNL of Currency		PNL of Universe	
		PNL Level	PNL Slope	PNL Level	PNL Slope	PNL Level	PNL Slope	PNL Level	PNL Slope
Univariate	Coef	1.84%	(1.08%)	1.95%	(1.05%)	1.47%	(0.86%)	1.17%	(.52%)
	T-stat	31	(17)	31	(17)	9.0	(3.2)	19	9
Multivariate	Coef	1.00%	(0.65%)	1.26%	(0.63%)	1.04%	(0.65%)	0.61%	(0.20%)
	T-stat	14	(9)	17	(9)	16	(10)	9	(3)

- **A: Not really. All four PNL frames add to incremental risk reduction**

How does past performance affect institutions' willingness to take risk?

- **Results are robust to the inclusion of other conditioning variables**
  - Flows
  - Lagged dependent variables
  - Digital vs. cardinal specifications of rhs variables

- **Interpretations**
  - **Individual positions reduced following poor performance at all four levels**
    - fund/currency; fund; currency; universe
  - **For the same lag of PNL, still-open contracts matter far more than closed contracts, Light BEER!**
  - **Not mechanical (timing, long v. short, single vs. fund-wide positions)**
  - **Evidence that funding constraints may matter beyond risk appetite *per se*, because fund and universe-level effects survive over individual position and currency-level performance effects**
  - **Some effects can offset: funds making (losing) money cope better with position loses (gains)**

A panic index?:
Profit and Loss fitted from panic trade regression
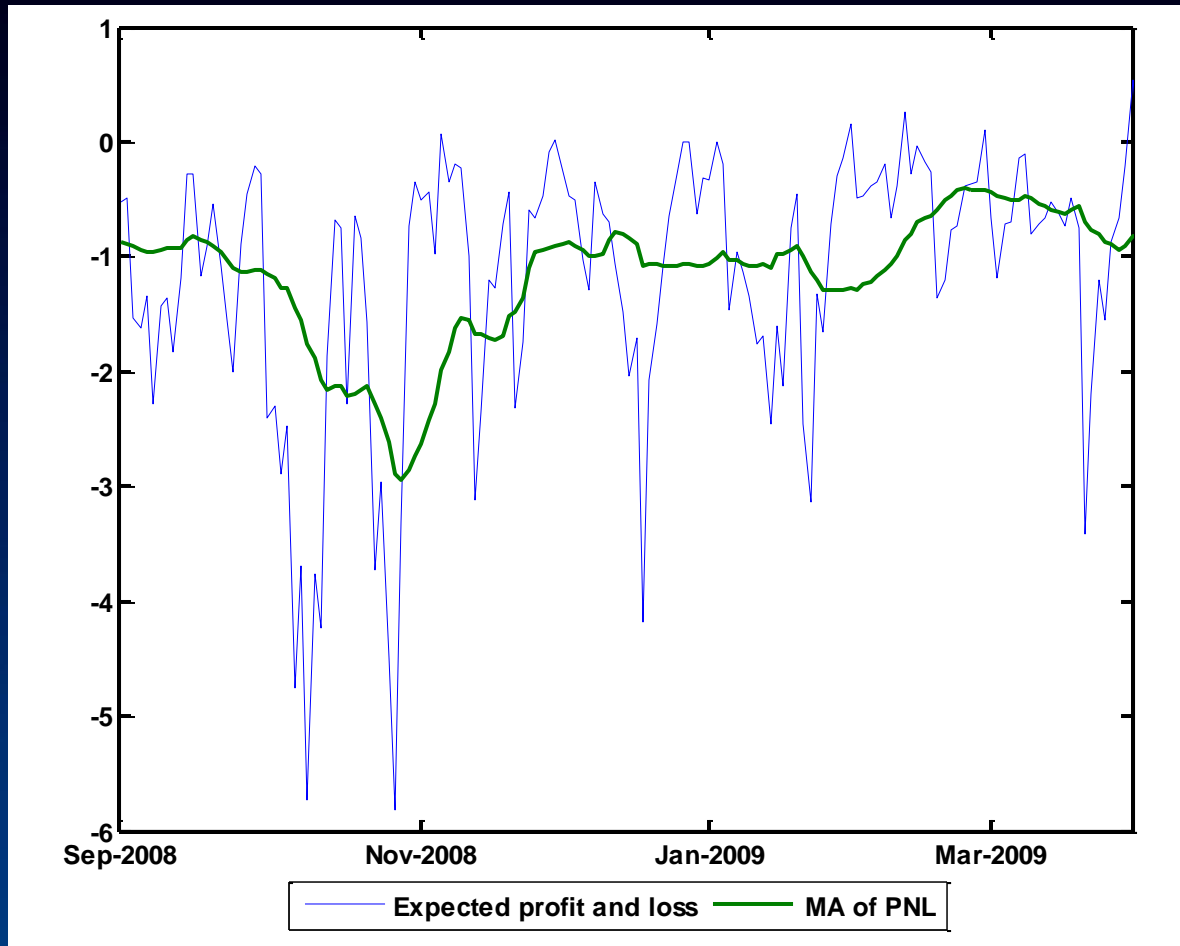
Summary

- **Numerous behavioral measures help predict future institutional investor demand for liquidity – flows, holdings, supply/demand, agreement, risk appetite**

- **One potential source of risk appetite changes comes from past performance**
    - **There is strong evidence that past negative institutional performance leads to reduced risk taking, with the framing over losses coming from all levels of PNL changes: individual fund/currency positions; fund-wide positions; aggregate currency positions; and universe-wide aggregate performance.**
    - **Responses are asymmetric, with positions added after gains being far smaller than those cut after losses**
    - **There is strong evidence that institutions frame PNL by focusing on the PNLs of contracts currently in place and ignoring those that have been closed-out, even if only very recently.**

- **These findings allow us to calculate most impactful breakeven exchange rates**

- **And, by extension, may signal usefulness of breakeven prices for equities, bonds, etc.**

Summary, continued…

- **Trade decisions made conditional on large losses and risk reduction lose money**

- **Those made conditional on gains and risk increases make money**