

Herding in Financial Markets

***Some Preliminary Evidence from
Economists' Surveys***

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Summary

- Empirical density functions are narrower than outcomes
- The forecast median does not appear to be efficient in real time
- Forecasting quality does not improve as we approach forecast time
- Some herding by firms/forecasters
- Some leadership by firms/forecasters
- Contributes to financial market volatility

The Data Set

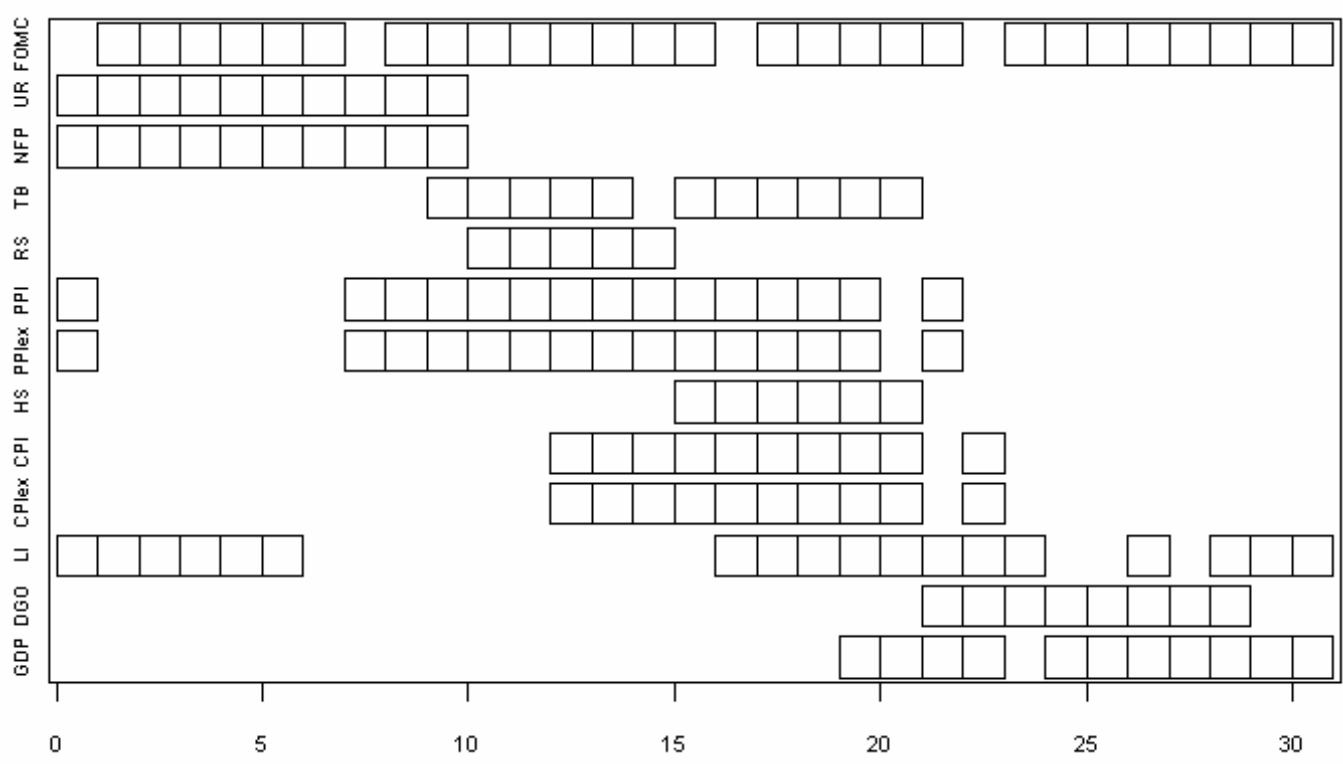
- Monthly Forecasts of main US indicators
e.g. non-farm payrolls
- Ongoing survey conducted by
Bloomberg
- Up to some 75 economists forecasting
US macro data
- We have date, firm, person stamps
- For CPI, PPI, non-farm payrolls, housing
starts, durable goods orders, ISMs etc

Snapshot: Dataset

1)	David Sloan	4CAST Ltd.	125	8/29/2006	01-Sep-06
2)	Steven Ricchiuto	ABN Amro Inc.	150	8/25/2006	
3)	Markus Schomer	AIG Global Investment Group	150	8/31/2006	
4)	Mike Englund	Action Economics	130	8/18/2006	
5)	Francesca Panelli	Aletti Gestielle SGR	110	8/25/2006	
6)	Richard Yamarone	Argus Research Corp.	180	8/24/2006	
7)	Sherry Cooper	BMO Capital Markets	130	8/28/2006	
8)	Brian Fabbri	BNP Paribas	100	8/24/2006	
9)	Lynn Reaser	Banc of America Capital	130	8/28/2006	
10)	Mickey Levy	Banc of America Securities	130	8/18/2006	
11)	Paolo Guida	Banca IMI	105	8/29/2006	
12)	Ellen Beeson Zentner	Bank of Tokyo- Mitsubishi UI	115	8/18/2006	
13)	Bantleon Bank AG	Bantleon Bank AG	110	8/28/2006	
14)	Dean Maki	Barclays Capital	125	8/28/2006	
15)	John Ryding	Bear, Stearns & Co.	150	8/29/2006	
16)	Timothy Rogers	Briefing.com	120	8/25/2006	
17)	Dariusz Kowalczyk	CFC Group	135	8/29/2006	
18)	Avery Shenfeld	CIBC World Markets	110	8/25/2006	
19)	Michael Carey	Calyon	110	8/25/2006	
20)	Ken Mayland	ClearView Economics	150	8/25/2006	
21)	Patrick Franke	Commerzbank AG	125	8/25/2006	

- 5286 forecasts of 77 monthly outcomes for Non-Farm Payrolls

Pattern of Releases



- Data is released throughout out the month...

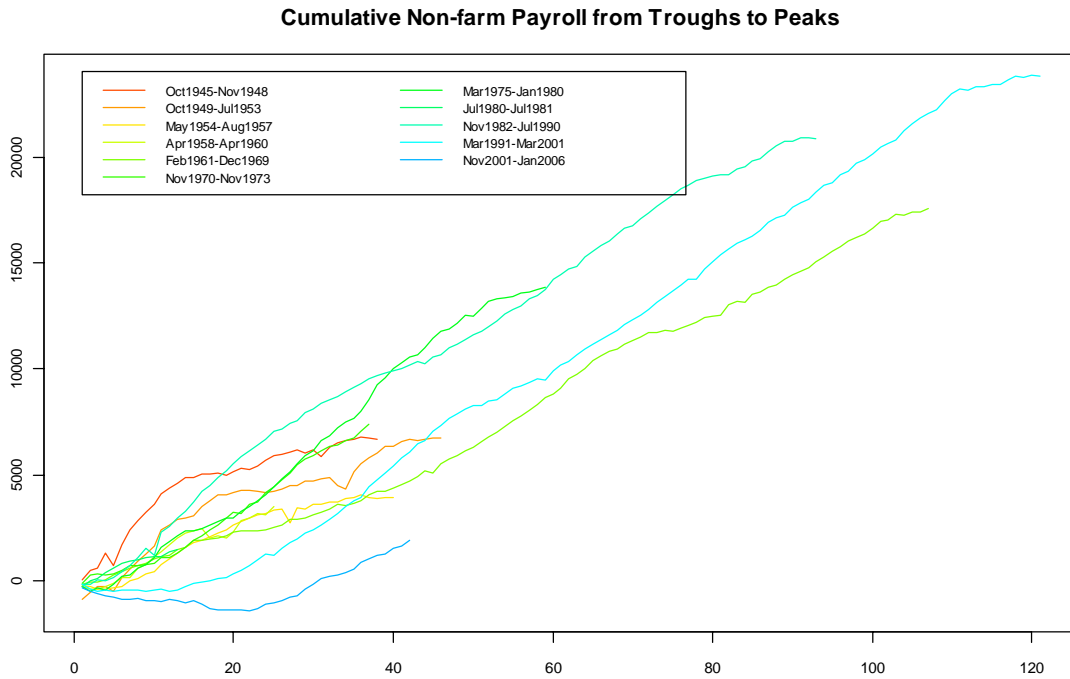
Tests of median forecasts

	1999-2005		1999-2001		2002-2005	
	Intercept	Market Forecast	Intercept	Market Forecast	Intercept	Market Forecast
FOMC	-0.002	0.999 ***	0.065	0.987 ***	-0.012	1.002 ***
UR	0.157	0.964 ***	-0.026	1.006 ***	0.692	0.871 ***
NFP	-40.337 *	1.077 ***	-58.549 *	1.156 ***	-21.568	0.936 ***
TB	-0.545	0.996 ***	-2.540	0.911 ***	-1.487	0.979 ***
RS	-0.217 .	1.695 ***	-0.387 .	2.248 *	-0.097	1.404 ***
PPI	-0.160 **	1.923 ***	-0.143 *	1.808 ***	-0.180 *	2.019 ***
PPIlex	-0.107 *	1.879 ***	-0.105 *	1.812 ***	-0.124	2.086 **
HS	162.453	0.917 ***	561.414 *	0.663 ***	255.658	0.871 ***
CPI	-0.077 **	1.261 ***	-0.070 .	1.304 ***	-0.084 *	1.233 ***
CPIlex	0.086 .	0.544 *	0.146 *	0.322	0.067	0.578
LI	-0.018	1.230 ***	-0.013	1.210 ***	-0.022	1.243 ***
DGO	-0.046	1.477 ***	0.567	1.706 ***	-0.308	1.111 **
GDP	-0.061	1.027 ***	-0.110	1.044 ***	0.032	1.000 ***

Note: Significant codes: "." < 10%, "*" < 5%, "***" < 1%, "****" < 0.1%

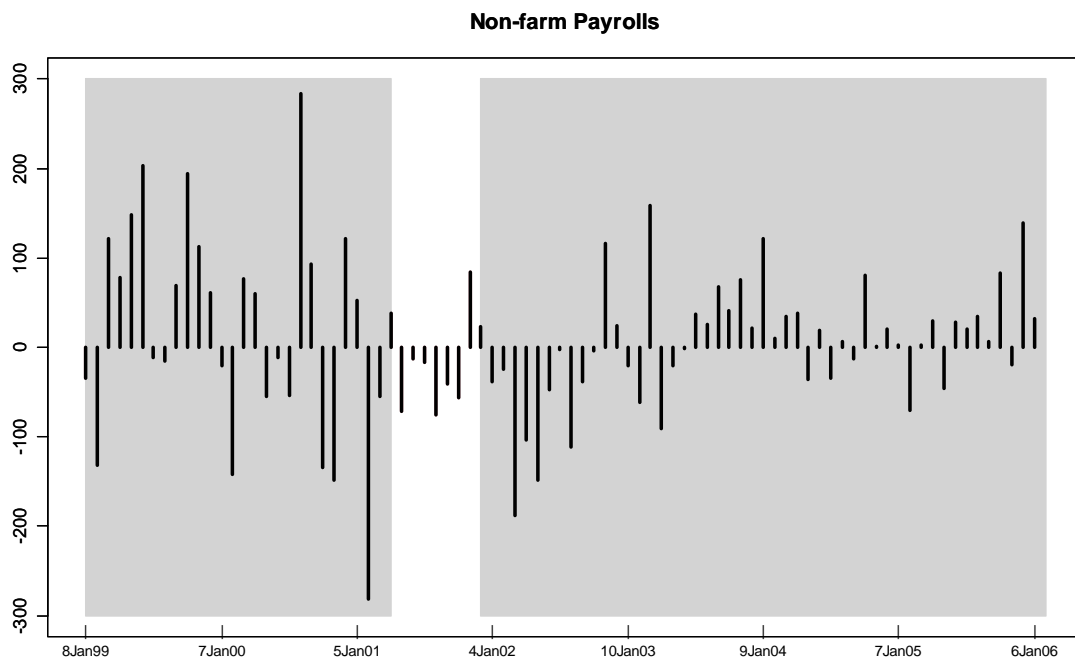
- Note NFP forecasts overestimate of level

Forecasting Payrolls: jobless recovery



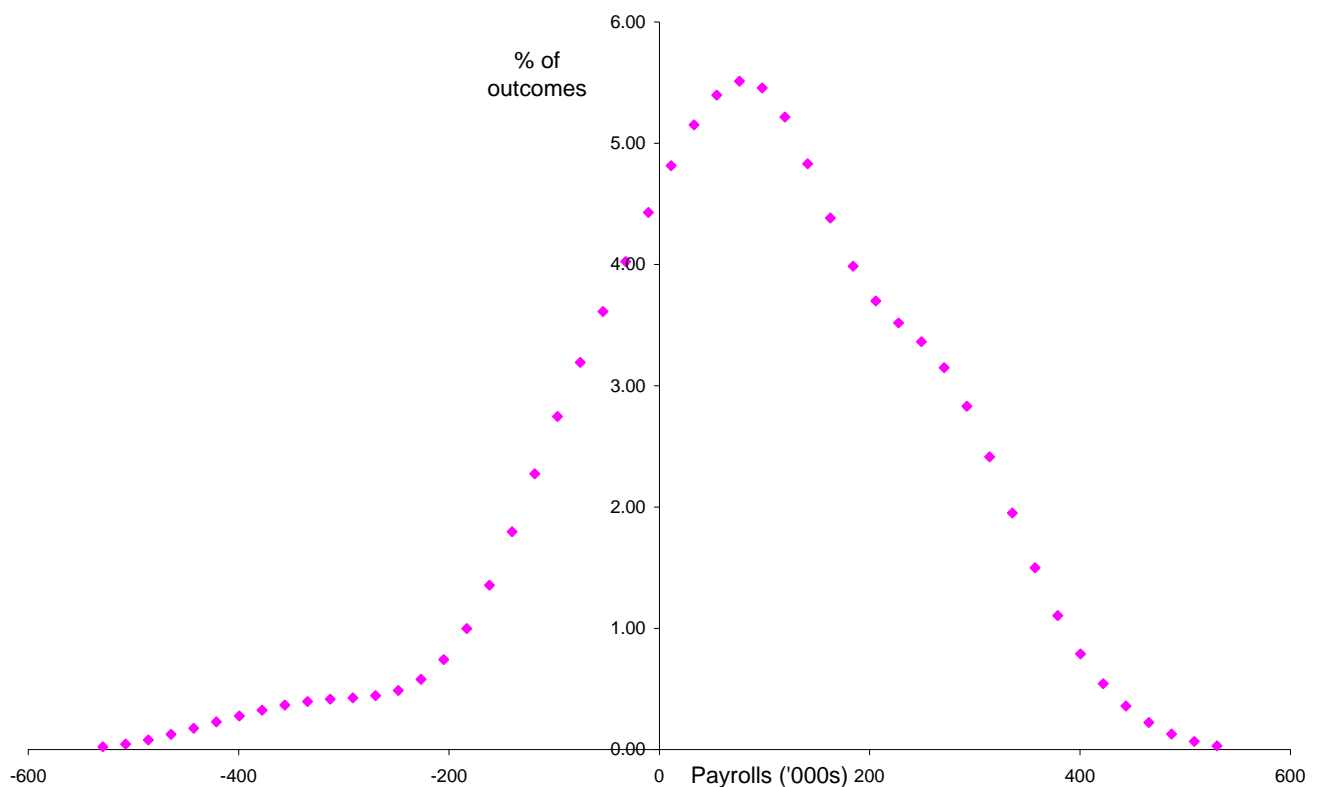
● Using 'old' model

Forecasting Payrolls: Final over Initial



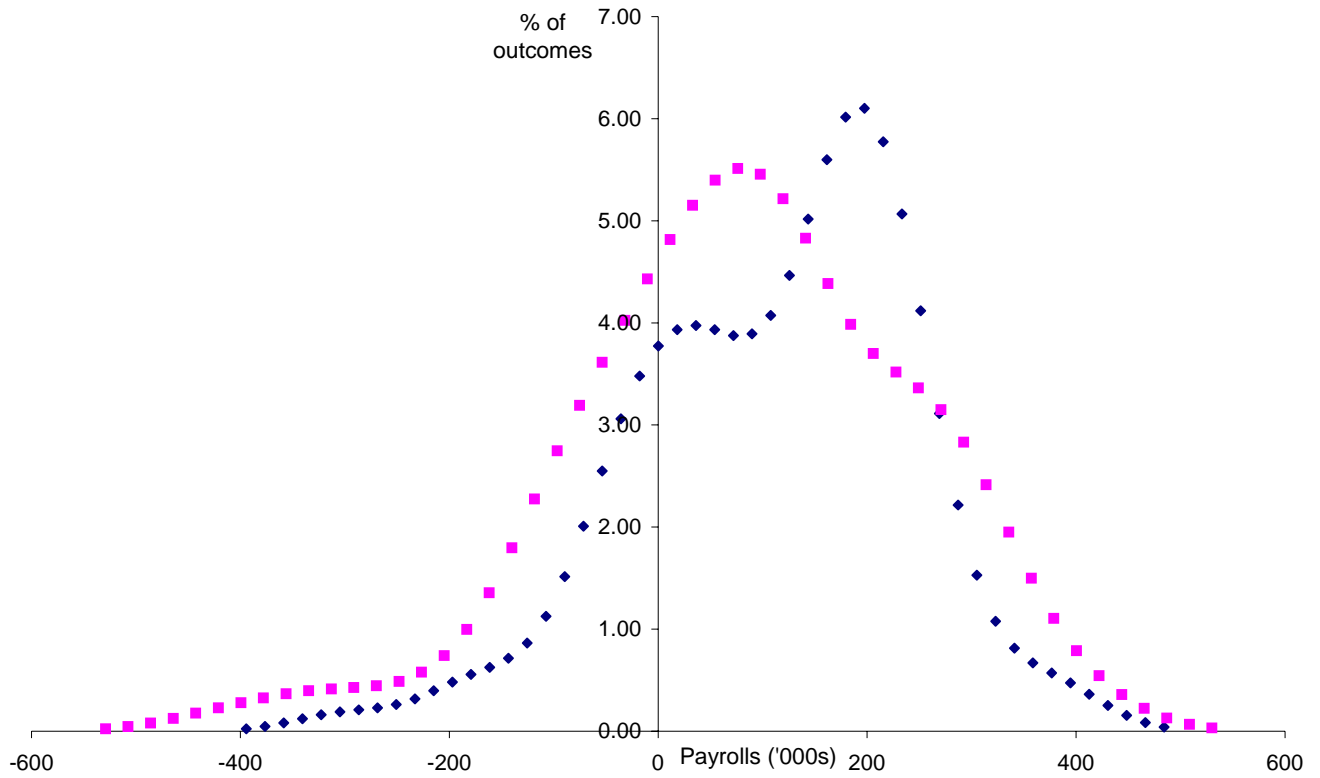
- median of final release 112K cf median of first release 86K

Distribution of payrolls outcomes



- Time Series outcomes of payrolls since 1999

Distribution of Outcomes and Forecasts



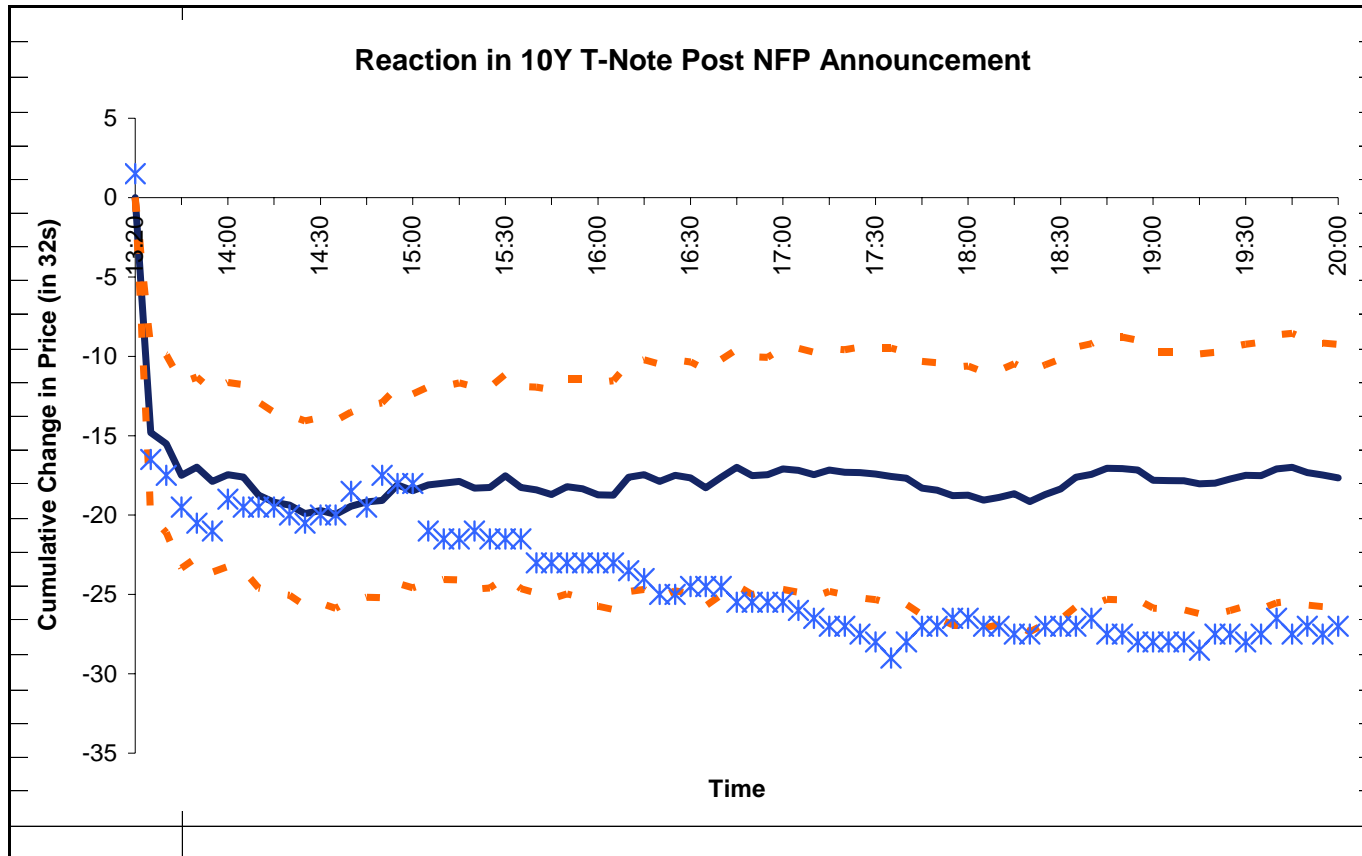
● Comparing Time Series to Forecasts

Digression on Risk Aversion

$$\begin{aligned}\frac{p(S_T)}{q(S_T)} &= \lambda \frac{U'(S_T)}{U'(S_t)} \\ &= \lambda \frac{C_T^{-\rho}}{C_t^{-\rho}} \\ &= \lambda \left(\frac{C_t}{C_T} \right)^\rho\end{aligned}$$

- Ratio of Objective Density Function to Risk-Neutral Density Function related to risk aversion.

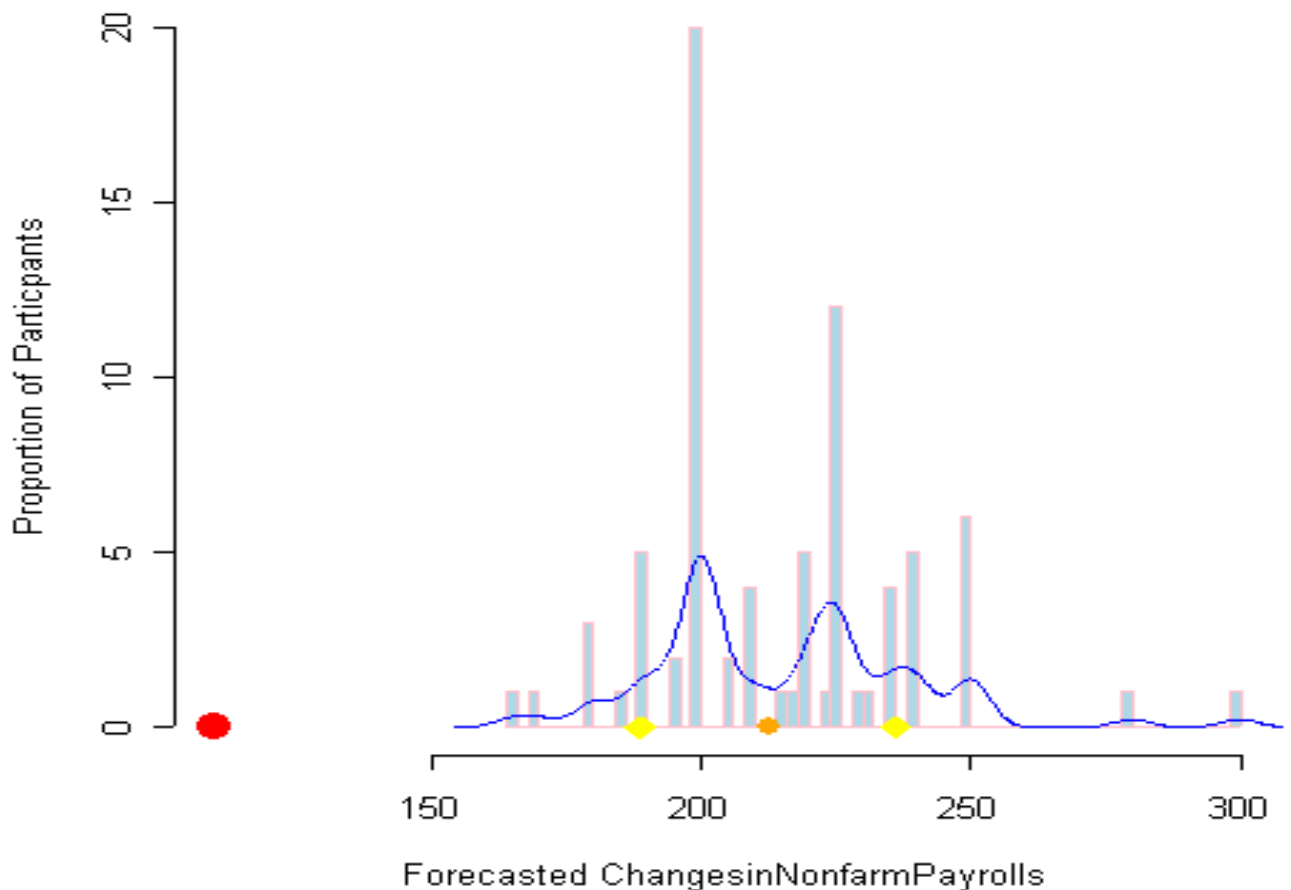
Incentive to Forecast?



● Yes!

Using the survey as a Density Forecast

Forecast Survey of Changes in Nonfarm Payrolls : 1Apr05



- Compare outcome to cross-sectional forecast

Risk-Loving Economists

Non-Farm Payrolls

Raw Survey	Kernel Density	Survey Data
full sample	0.224	0.224
from 2001	0.156	0.156
from 2001:earlier half	0.156	0.156
from 2001:later half	0.143	0.143

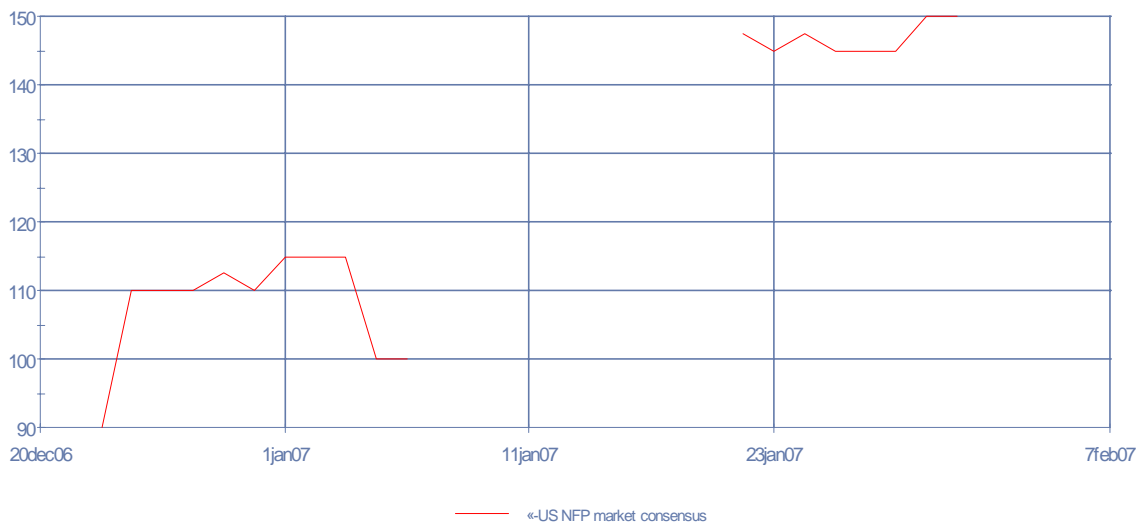
Adjusted Survey	Kernel Density	Survey Data
full sample	0.263	0.263
from 2001	0.208	0.208
from 2001:earlier half	0.182	0.195
from 2001:later half	0.156	0.169
Adjusted Coeffients	alpha	beta
full sample	-40.337	1.077
from 2001	-37.831	1.094
from 2001:earlier half	-41.534	1.108
from 2001:later half	-34.386	1.095

Retail Sales

Raw Survey	Kernel Density	Survey Data
full sample	0.354	0.313
from 2001	0.354	0.313
from 2001:earlier half	0.375	0.313
from 2001:later half	0.354	0.313

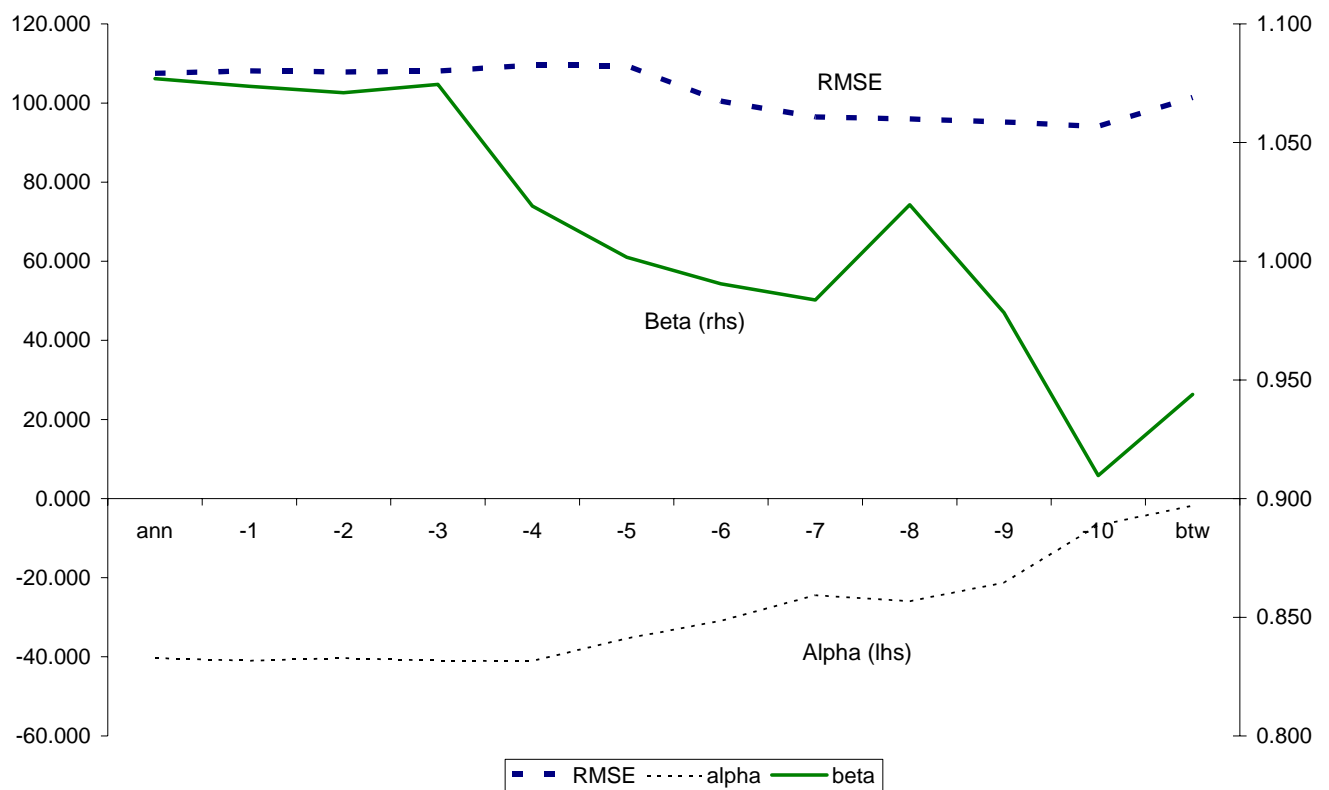
Adjusted Survey	Kernel Density	Survey Data
full sample	0.479	0.354
from 2001	0.479	0.354
from 2001:earlier half	0.438	0.396
from 2001:later half	0.438	0.333
Adjusted Coeffients	alpha	beta
full sample	-0.217	1.695
from 2001	-0.217	1.695
from 2001:earlier half	-0.190	1.598
from 2001:later half	-0.212	1.669

Consensus as we approach announcement?



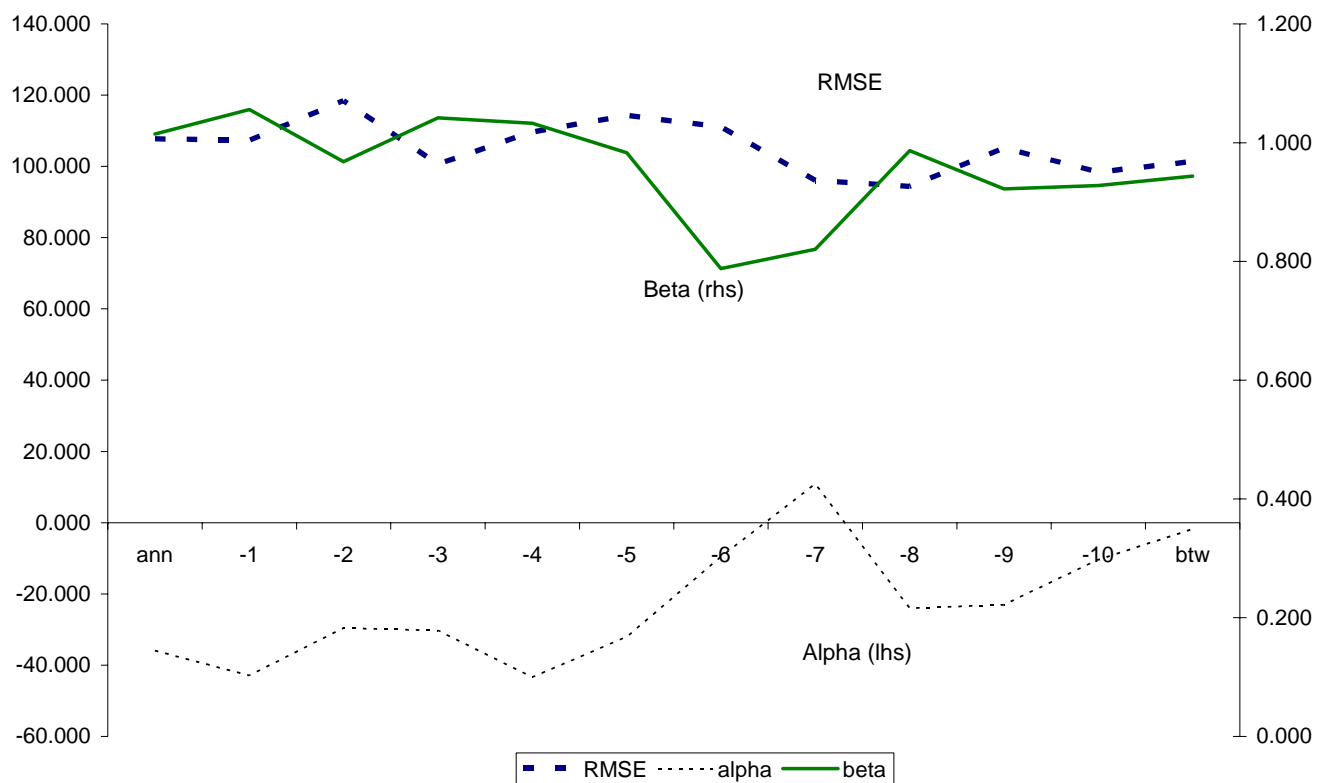
- Is there any time variation in the economist median?

Do forecasts improve as we near announcement: I?



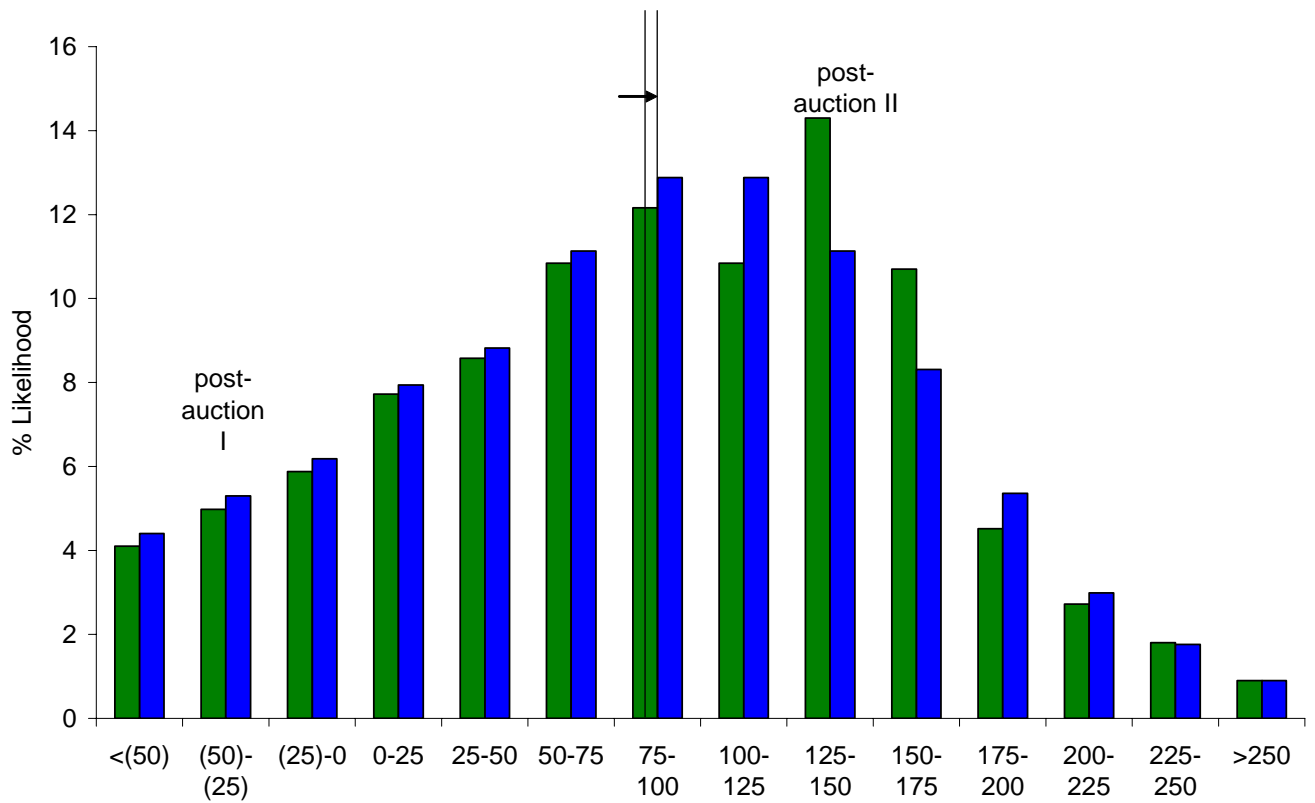
- ‘Integrated’ median as we approach announcement date

Do forecasts improve as we near announcement: II?



- Daily median shows no sign of improvement

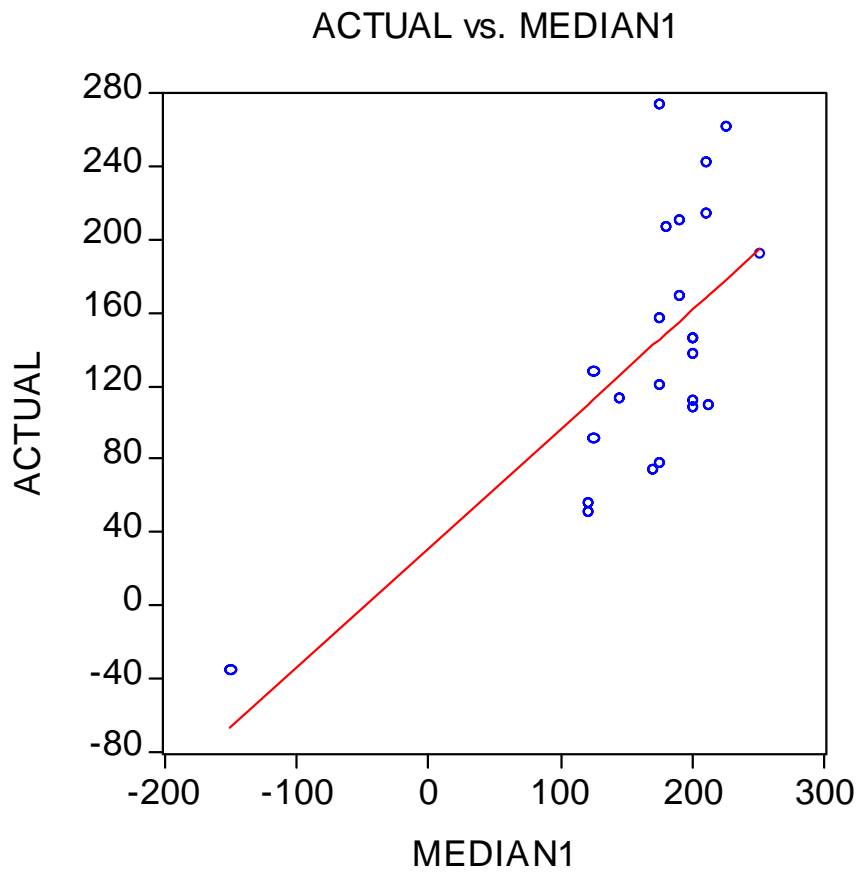
How about other markets?



● Chicago Metals Exchange Derivatives Auction

Traders' Auction vs Economists

Final median versus outcomes



Explaining Herding

$$U_E = -[\tau(f_i - \theta)^2 + (1 - \tau)(f_i - \bar{f})^2]$$

$$PB = \theta + \eta \sim (0, \sigma_\eta^2)$$

$$PR_i = \theta + \varepsilon_i \sim (0, \sigma_\varepsilon^2)$$

$$\alpha = \frac{1}{\sigma_\eta^2}, \beta = \frac{1}{\sigma_\varepsilon^2}$$

$$f_i = \frac{\alpha PB + \tau\beta PR_i}{\alpha + \tau\beta}$$

Regressions (Zitzewitz, 2006)

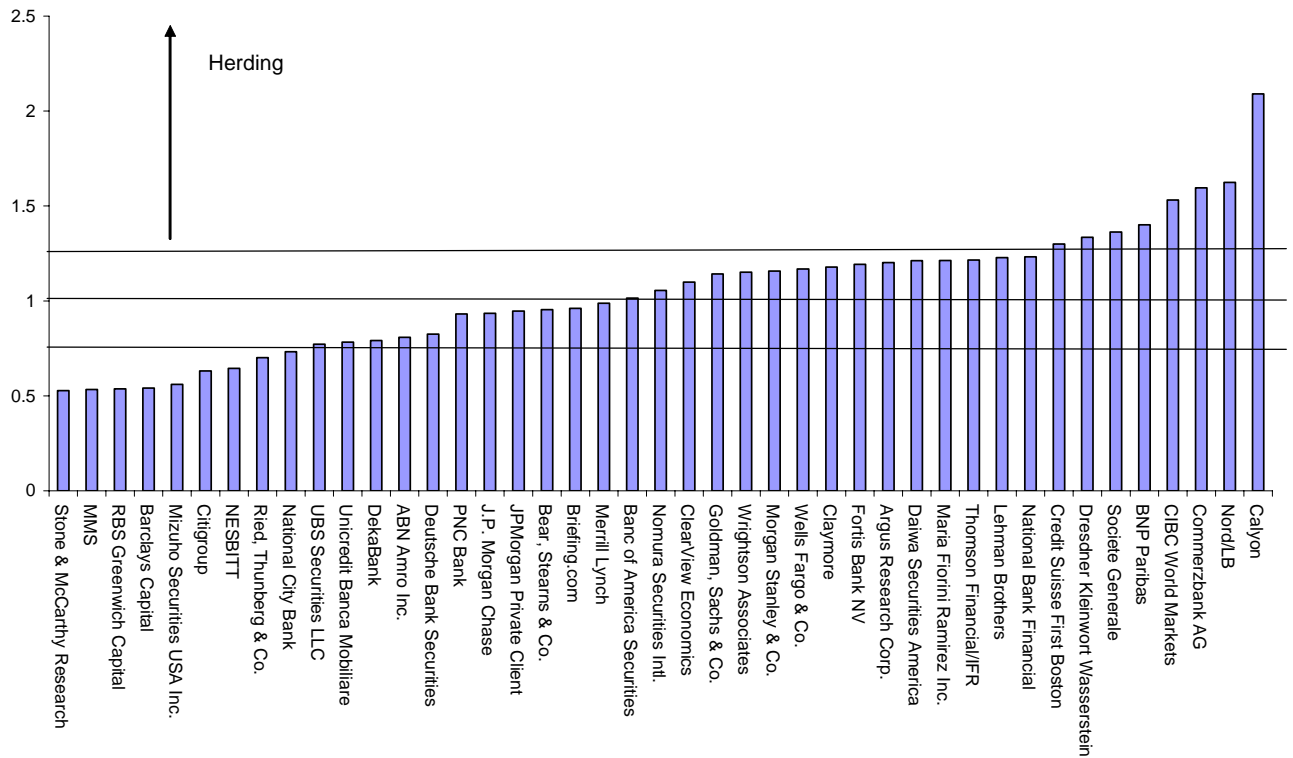
$$f_i = \frac{\alpha PB + \tau \beta PR_i}{\alpha + \tau \beta}$$

$$\frac{\sigma_{f_i PB}}{\sigma(f_i - PB)} = \frac{\uparrow}{\downarrow} \implies \text{high}$$

$$\frac{\sigma_{f_i PB}}{\sigma(f_i - PB)} = \frac{\downarrow}{\uparrow} \implies \text{low}$$

- Upper case implies herding and lower case implies anti-herding (leadership)

Herding Results



- Herders: Calyon, Nord. LB, Commerz., CIBC, BNP Paribas, Dresdner, CSFB
- Leaders: Stone McCarthy, MMS, RBS, BarCap, Mizuho

Looking at the Herders

	R1	R2	R3	Modal Forecast
Barclays Capital	3.06	2.36	1.1	7
Citigroup	1.84	2.71	1.85	7
Mizuho	1.97	2.29	0.81	7
MMS	1.71	0.45	1.42	0
Stone & MacCarthy	2.04	1.85	0.62	11

t-stat

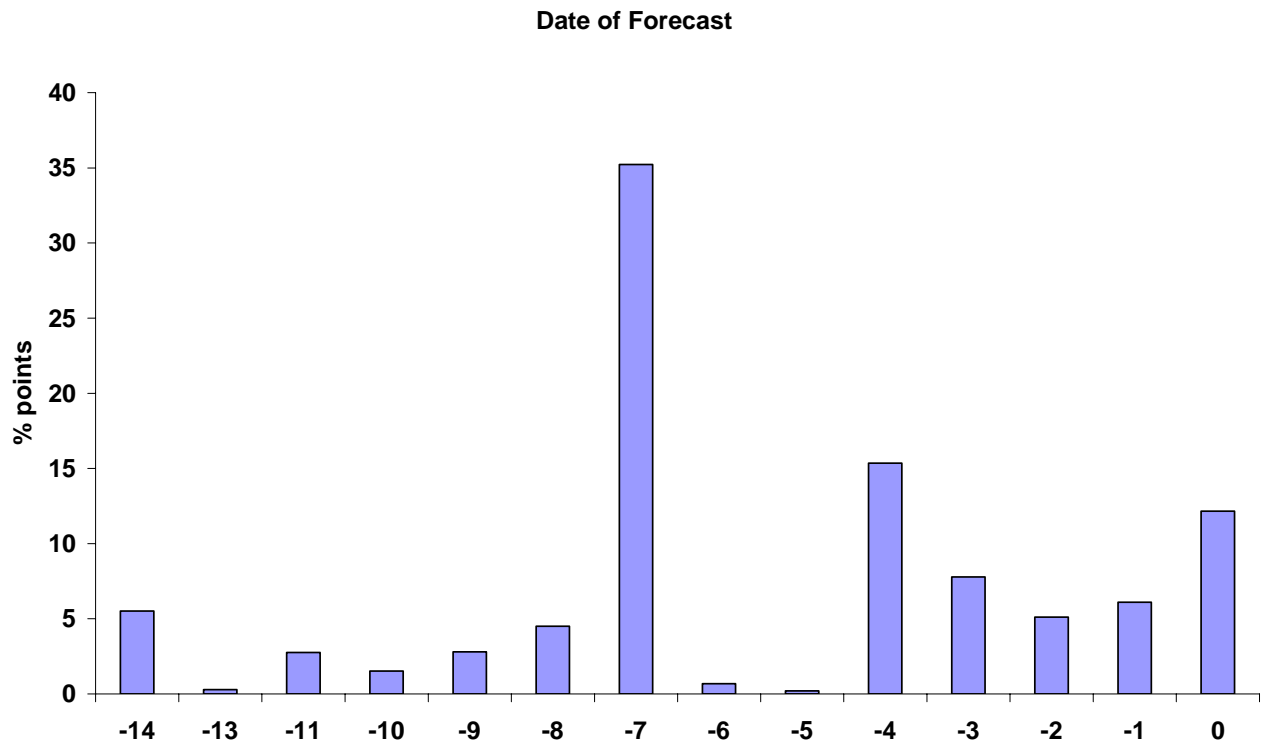
$$R1 : \text{actual}_t = c + \alpha * \text{median}_t + \beta * \text{bankforecast}_{t-i} + \varepsilon_t,$$

$$R2 : \text{actual}_t = c + \alpha * \text{median}_t + \beta * (\text{bankforecast}_{t-i} - \text{median}_{t-i}) + \varepsilon_t$$

$$R3 : \text{actual}_t - \text{median}_t = c + \beta * \text{bankforecast}_{t-i} + \varepsilon_t$$

- Mixed evidence that anti-herders are ignored

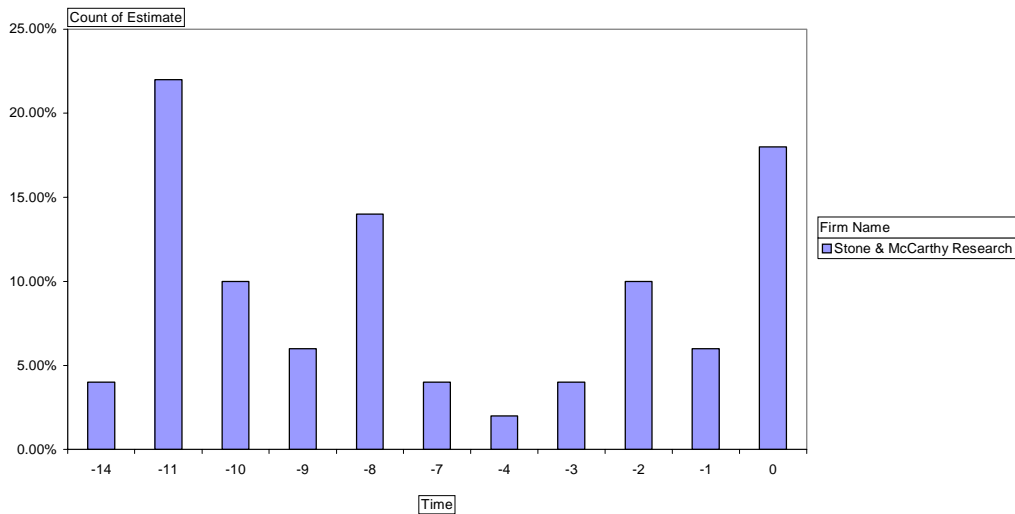
When do Forecasters Forecast?



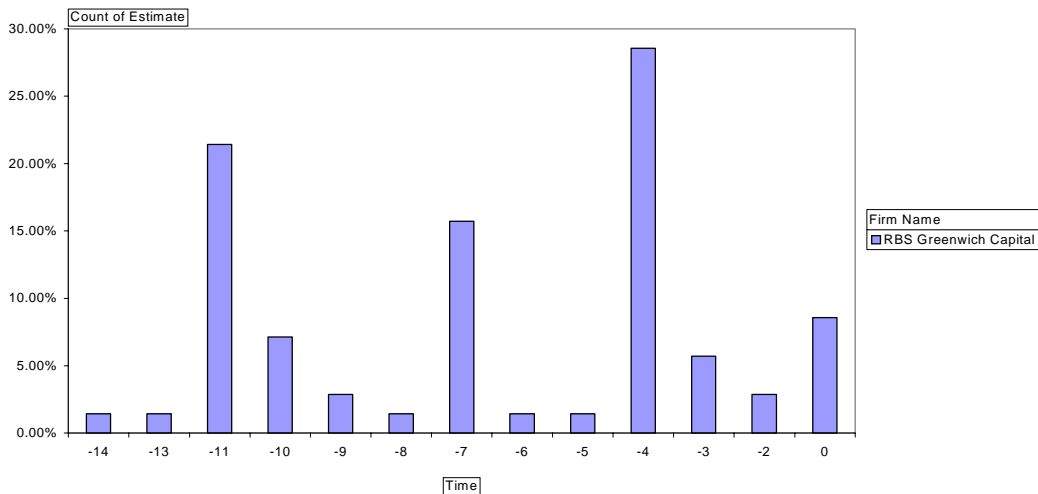
- On the seventh day...!

Compare leader to herder

Stone & McCarthy Research

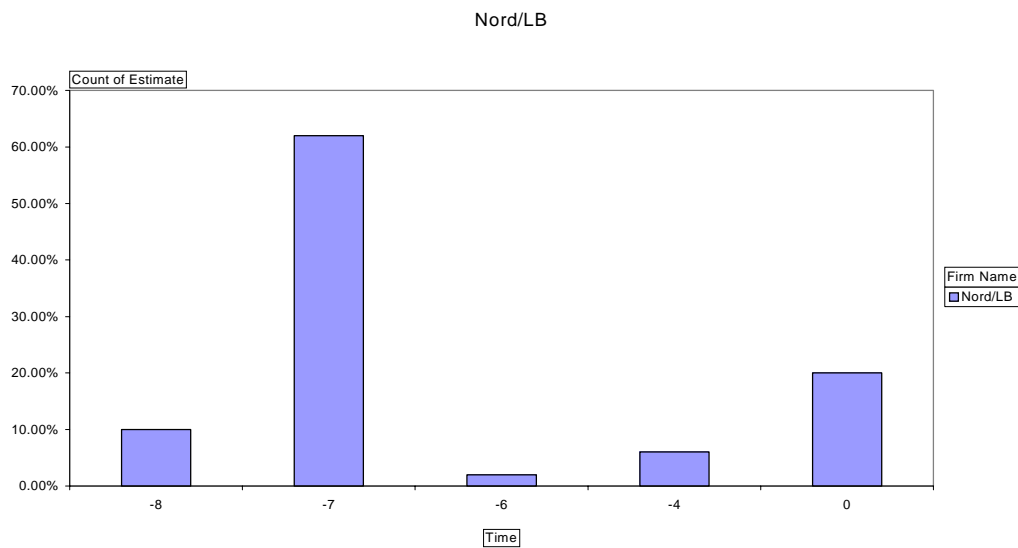
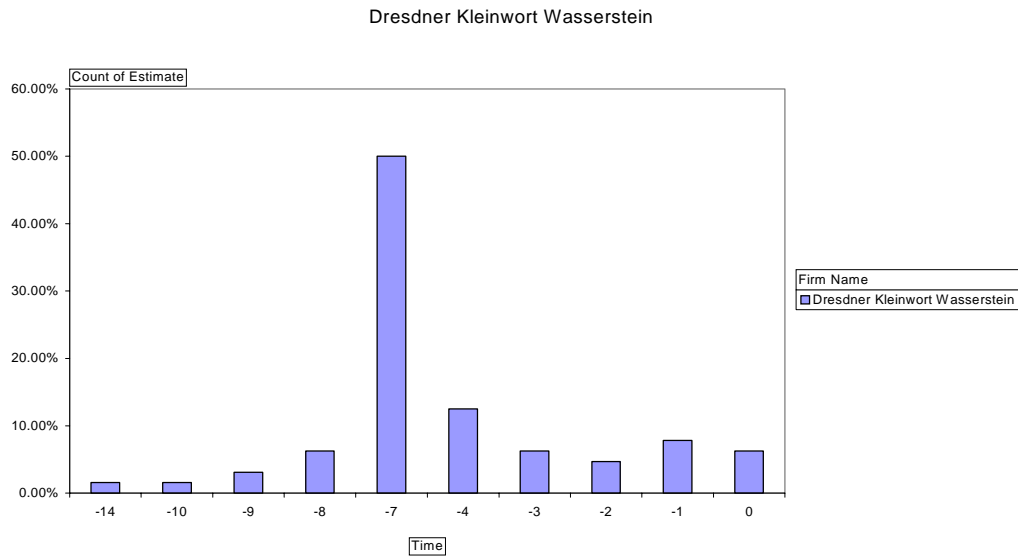


RBS Greenwich Capital



● Leaders disperse

Compare leader to herder II



● Followers concentrate?

Summary of Findings

- Payoffs to forecasts matter (!)
- Data flows throughout the month and consensus changes
- Mostly rational forecasts BUT tails underpredicted - forgoing returns from the tails
- No palpable improvement in forecasts as we approach forecast date
- Also traders' markets look "sticky"
- Some market leadership (anti-herding) and some herding - need to examine characteristics
- Directional trades may dominate and hence tails are no forecast