Discussion of:

Speculative Betas

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Outline

- Summary & Model
- Related Empirical Results
- Inverse-U Relation
- What is measured variance/covariance capturing?

Summary & Model

- Hong & Sraer constuct a model with:
  1. Disagreement (Miller (1977)) among agents.
  2. Short sale constraints
- Price process for N firms, $b_1 < b_2 < \cdots < b_N$:

$$\tilde{d}_i = b_i \tilde{z} + \tilde{\epsilon}_i$$

- Basic idea:
  - Holding σ_ϵ constant (it is), if you have a view on the "market," you should buy high beta assets.
  - Given short-sale constraints, prices of high beta assets are pushed too high
  - A very nice dynamic model delivers the inverse-U beta-return relation, which is stronger with high disagreement. – consistent w/ empirical results.

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Other Asset Classes

- Frazzini and Pedersen (2010):
  1. Document the same “flat” SML in other market classes
     - where the market is the asset-class specific market
  2. Document that the conditonal slope of the SML is correlated with measures of liquidity.
  3. argue that this is driven by leverage constraints, and a high appetite for risk on the part of investors.

Other Risk Factors

- It turns out that, empirically, we see the same low price of risk for other “factors.”
- In Daniel and Titman (1997), we show this for Mkt, HML, and SMB.
- changes in the factor betas don’t affect average returns, controlling for characteristics.
  - Like in these SML studies, our instrument for factor betas is lagged, estimated betas.

Daniel & Titman – Table 5

Char Port		Factor Loading Portfolio					Factor Loading Portfolio				
BM	SZ	1	2	3	4	5	1	2	3	4	5
				α					$t(\alpha)$		
1	1	−0.58	0.14	0.06	−0.17	−0.67	−3.97	1.04	0.48	−1.34	−4.00
1	2	0.16	0.05	0.13	0.16	−0.08	0.94	0.47	1.12	1.33	−0.63
1	3	0.02	0.05	0.06	−0.06	0.28	0.15	0.42	0.50	−0.55	2.26
2	1	0.13	0.08	0.06	0.21	−0.31	1.05	0.87	0.73	2.13	−2.31
2	2	0.03	0.20	0.22	0.01	−0.31	0.24	1.71	2.05	0.14	−2.66
2	3	0.19	−0.08	0.05	−0.10	−0.07	1.13	−0.50	0.35	−0.67	−0.46
3	1	0.08	0.05	0.10	0.01	−0.47	0.70	0.55	1.06	0.10	−3.27
3	2	0.17	0.22	0.25	0.05	−0.31	1.25	1.67	1.94	0.36	−1.63
3	3	−0.01	0.16	−0.23	−0.12	−0.18	−0.04	1.13	−1.45	−0.74	−0.90
Average		0.02	0.10	0.08	0.00	−0.24	0.16	0.82	0.75	0.08	−1.51

Idiosyncratic Volatility

- More recently, Ang, Hodrick, Xing and Zhang (2006, 2006) document a related "idiosyncratic volatility" anomaly.
- They find, for portfolios formed on lagged historical idiosyncratic volatility, that the price of idiosyncratic risk is *negative*.

$\hat{\beta}_m$-$\hat{\sigma}_\epsilon$ sorted portfolios

Estimated $\hat{\beta}_m$:

	$\hat{\sigma}_{\epsilon,t-1}$ *quintile*				
$\hat{\beta}_m$	Lo	2	3	4	High
Lo	0.49	0.51	0.50	0.47	0.43
2	0.82	0.83	0.84	0.84	0.84
3	1.09	1.10	1.11	1.11	1.11
4	1.37	1.39	1.40	1.41	1.41
Hi	1.77	1.83	1.90	1.97	2.05

$\hat{\beta}_m$-$\hat{\sigma}_\epsilon$ sorted portfolios

Estimated σ_ϵ:

	$\hat{\sigma}_{\epsilon,t-1}$ *quintile*				
$\hat{\beta}_m$	Lo	2	3	4	High
Lo	0.84	1.26	1.62	2.14	3.35
2	0.94	1.28	1.62	2.11	3.16
3	1.04	1.35	1.69	2.15	3.19
4	1.13	1.41	1.74	2.23	3.21
Hi	1.31	1.58	1.93	2.40	3.41

$\hat{\beta}_m$-$\hat{\sigma}_\epsilon$ sorted portfolios

FF 3-factor alpha(%/month):

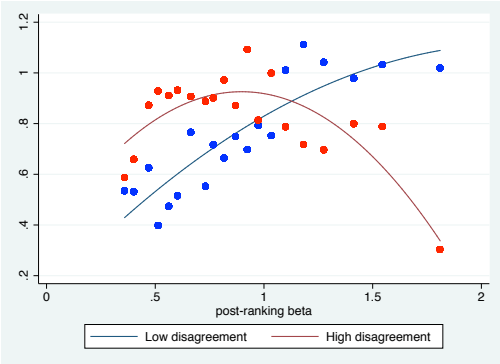
	$\hat{\sigma}_{\epsilon,t-1}$ *quintile*				
$\hat{\beta}_m$	Lo	2	3	4	High
Lo	0.15	0.14	-0.06	-0.07	-0.73
2	0.11	0.09	-0.11	-0.21	-0.78
3	0.05	-0.13	-0.10	-0.18	-0.56
4	-0.11	-0.14	-0.21	-0.38	-0.98
Hi	-0.15	-0.30	-0.27	-0.65	-1.18

The Inverse-U Relation

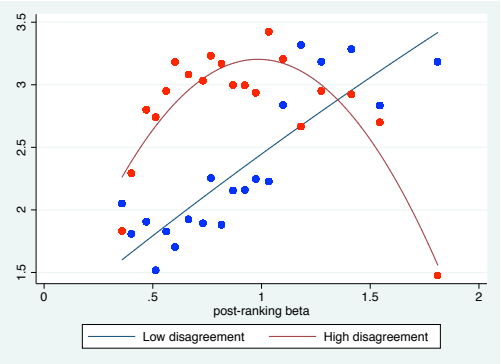
- One of the key empirical findings in this paper is the inverse-U shape in the relation between market and average returns.
  - Moreover, this relation is considerably more inverse-U shaped in times of high disagreement.
- This is an implication of their dynamic disagreement/constraints model.
  - As they point out, it is unique to their model.
- Thus, it's worth exploring this is a bit more detail.

The Inverse-U Relation

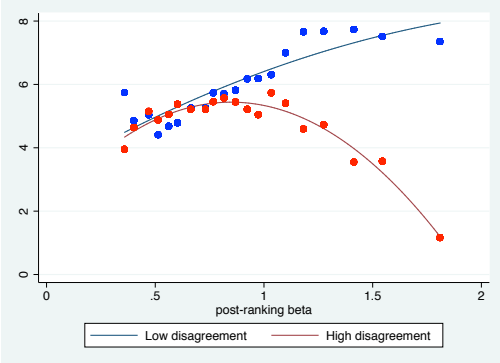
Figure 7: Average 1-month, 3-months, 6-months, and 12-months excess of risk-free returns for equal-weighted beta decile portfolios during low disagreement and high aggregate disagreement months.



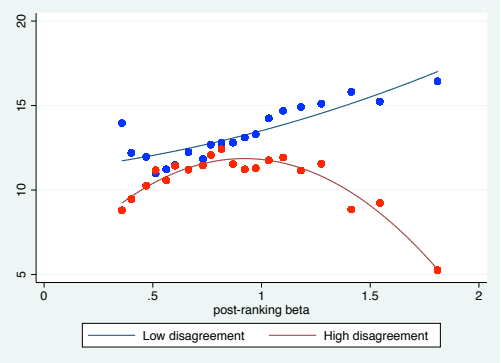
(a) 1 month equal-weighted return



(b) 3 months equal-weighted return



(c) 6 months equal-weighted return

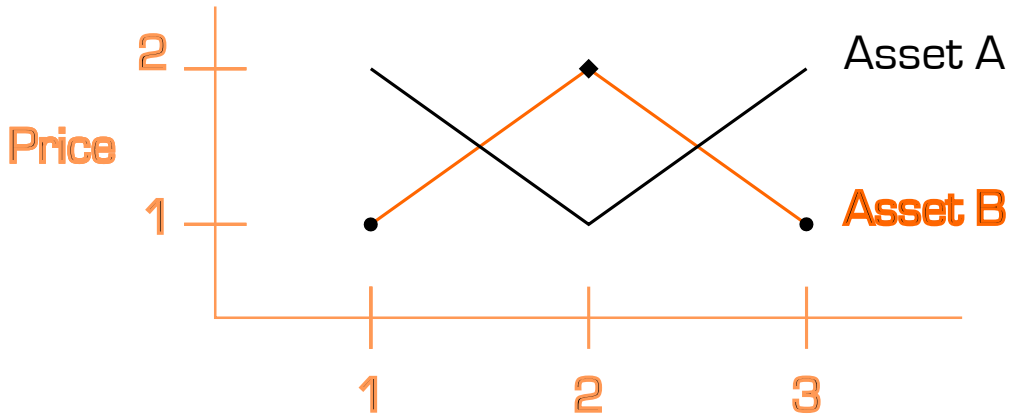


(d) 12 months equal-weighted return

Value- vs. Equal Weighting

- I can think of two additional factors that might contribute to the inverse-U shape that HS document:
  1. Equal-Weighting vs. Value weighting.
  2. Idiosyncratic Volatility Interaction.

EW Portfolio Return Bias



$$R_{EW,2} = (1/2)*(-50\%) + (1/2)*(+100\%) = 25\%$$
$$R_{EW,3} = (1/2)*(+100\%) + (1/2)*(-50\%) = 25\%$$

$$R_{EW,2} = \frac{Gain}{InitialCost} = \frac{(1/4)*(-1)+(1/2)*(+1)}{(1/4)*2+(1/2)*1} = 25\%$$
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- To avoid this bias, use VW or a buy-and-hold strategy.

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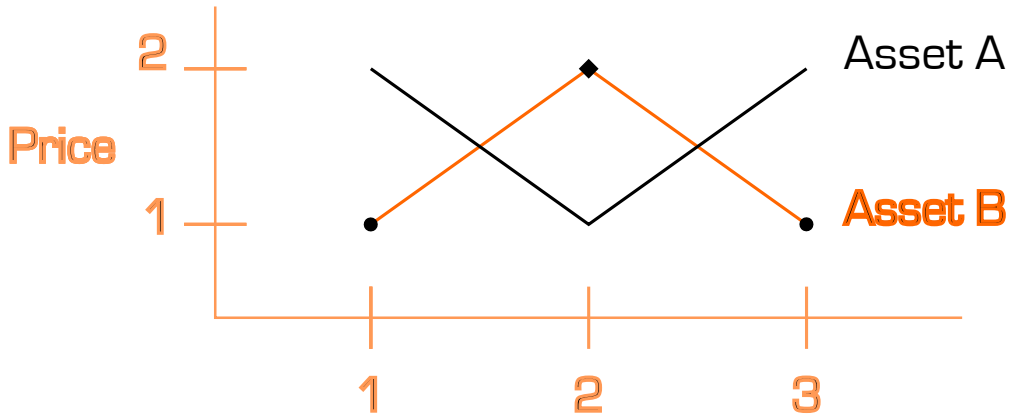

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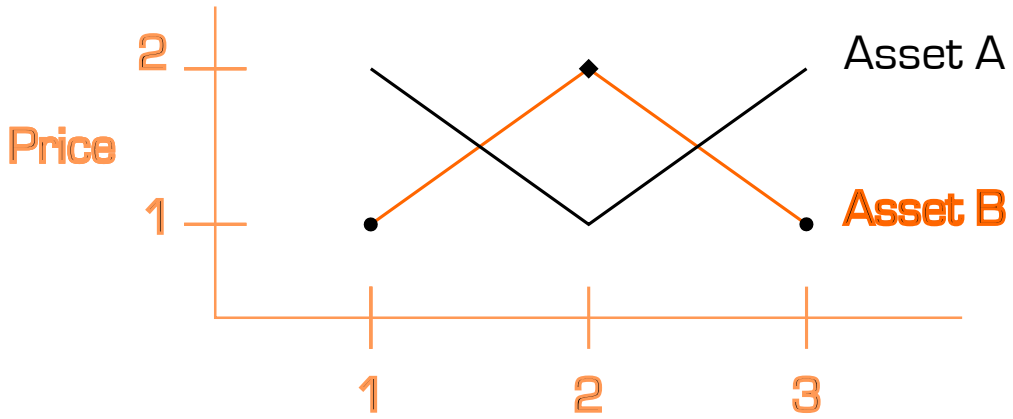

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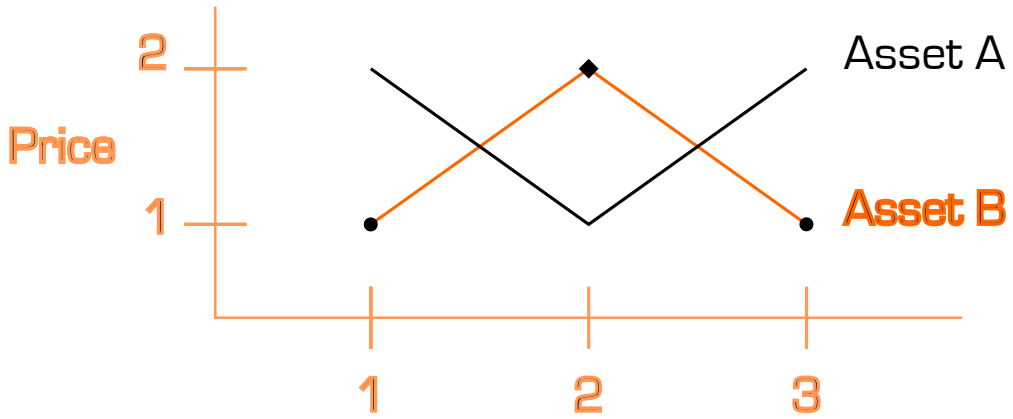

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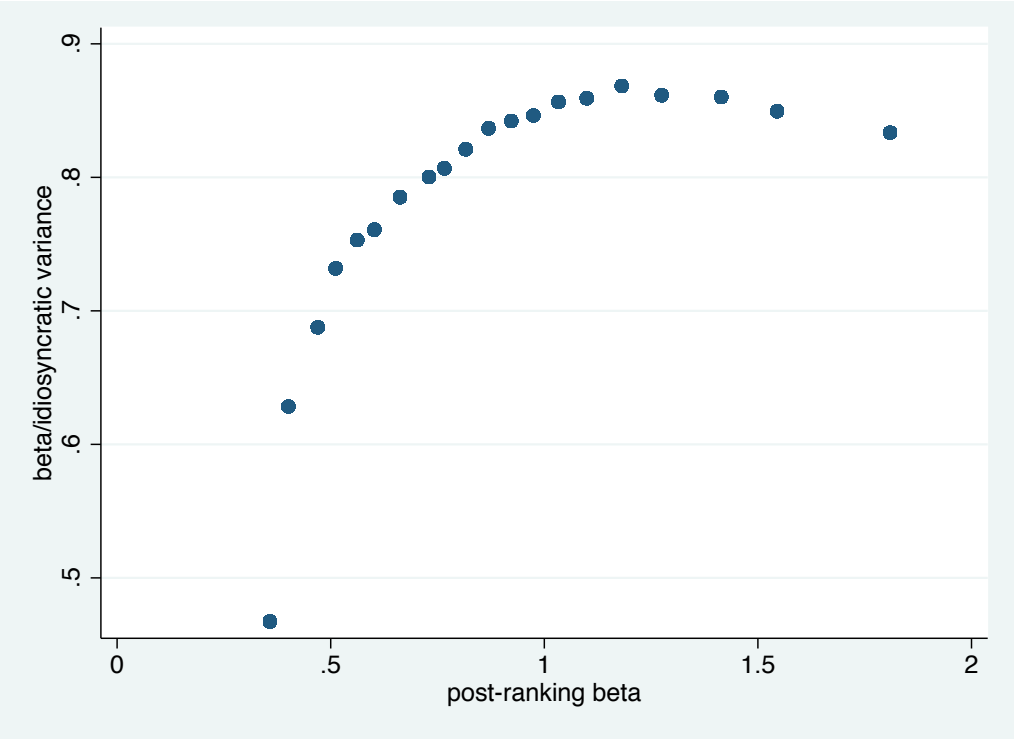
Idiosyncratic risk

Figure 2: Median stock-level ratio of β to σ_ϵ^2 by post-ranking β.



This figure plots the median stock-level ratio of β to σ_ϵ^2 for our 20 β portfolios, as a function of the post-ranking β. See Section 3.2 for the computation of stock-level β and residual variance σ_ϵ^2 as well as for the construction of the β portfolios.

Inverse-U Shape and σ_ϵ

- The extreme high *and low* estimated beta portfolios have considerably higher idiosyncratic risk than the middle portfolios.
  - This makes sense from a Bayesian perspective.
- But we have seen that high idiosyncratic volatility firms have low average returns.

Risk

- This paper, like much of the literature, adopts the view that price moves, and βs, reflect new information about future dividends.
  - Why do firms here have higher βs or σ_ϵs?
    - Only because they have higher cash-flow risk
- Firm's beta and risk is, in some sense, exogenous.
- Note that this view is challenged by much of the recent literature:
  - Volatility (Shiller (1981))
  - S&P inclusion (Shleifer (1986), Barberis and Shleifer (2003), Barberis, Shleifer, and Wurgler (2005), Greenwood (2008))

Risk

- In the HS model, a firm's beta and risk is, in some sense, exogenous.
- Note that this view is challenged by much of the recent literature:
  - Volatility
    - Shiller (1981), Campbell and Shiller (1988), and others.
  - S&P inclusion/Style comovement
    - Barberis and Shleifer (2003), Barberis, Shleifer, and Wurgler (2005), Greenwood (2008)
- I'm going to present some very preliminary work – for σ_ϵ rather than β_m – based on some preliminary joint work with Pierre Collin-Dufresne and Gur Huberman.

$\hat{\sigma}_{\epsilon,t-1} - \hat{\sigma}_{\epsilon,t-12}$ sorted portfolios

- Firms are indepently sorted into columns on the basis of last months estimated residual volatility, ...
- and into rows on the basis of 12-month lagged residual volatility.
  - We follow the procedure of Ang, Hodrick, Xing, and Zhang (2006)

Estimated $\hat{\sigma}_{\epsilon,t-1}$:

	$\hat{\sigma}_{\epsilon,t-1}$ *quintile*				
$\hat{\sigma}_{\epsilon,t-12}$	Lo	2	3	4	High
Lo	0.79	1.34	1.89	2.68	4.90
2	0.90	1.37	1.90	2.68	4.62
3	0.93	1.40	1.94	2.70	4.49
4	0.92	1.42	1.97	2.75	4.61
Hi	0.82	1.44	2.00	2.82	5.12

$\hat{\sigma}_{\epsilon,t} - \hat{\sigma}_{\epsilon,t-12}$ sorted portfolios

Estimated $\hat{\sigma}_{\epsilon,t-12}$:

	$\hat{\sigma}_{\epsilon,t-1}$ *quintile*				
$\hat{\sigma}_{\epsilon,t-12}$	Lo	2	3	4	High
Lo	0.79	0.91	0.93	0.91	0.87
2	1.34	1.37	1.40	1.42	1.43
3	1.89	1.91	1.94	1.97	1.99
4	2.65	2.67	2.71	2.76	2.82
Hi	4.59	4.41	4.40	4.58	5.15

$\hat{\sigma}_{\epsilon,t-1} - \hat{\sigma}_{\epsilon,t-12}$ sorted portfolios

- Both $\sigma_{\epsilon,t-1}$ and $\sigma_{\epsilon,t-12}$ forecast $\sigma_{\epsilon,t}$

Realized $\hat{\sigma}_{\epsilon,t}$:

	$\hat{\sigma}_{\epsilon,t-1}$ *quintile*				
$\hat{\sigma}_{\epsilon,t-12}$	Lo	2	3	4	High
Lo	0.88	1.22	1.51	1.90	2.69
2	1.11	1.37	1.68	2.06	2.79
3	1.23	1.54	1.86	2.29	3.02
4	1.38	1.73	2.06	2.53	3.41
Hi	1.58	1.97	2.39	2.88	4.19

$\hat{\sigma}_{\epsilon,t-1} - \hat{\sigma}_{\epsilon,t-12}$ sorted portfolios

- But, only relation with the "short-term component" of volatility is negative.
- Controlling for last months volatility, the relation with 12-month lagged volatility is actually *positive*.

Average Monthly Returns

	$\hat{\sigma}_{\epsilon,t-1}$ *quintile*				
$\hat{\sigma}_{\epsilon,t-12}$	Lo	2	3	4	High
Lo	0.90	0.89	0.74	0.59	0.55
2	0.98	0.99	0.99	0.98	0.44
3	1.15	1.24	1.12	0.89	0.39
4	1.10	1.28	1.27	1.02	0.32
Hi	1.04	1.18	1.43	1.21	0.54

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$\hat{\sigma}_{\epsilon,t-1} - \hat{\sigma}_{\epsilon,t-12}$ sorted portfolios

FF 3-factor alphas(%/month)

	$\hat{\sigma}_\epsilon$ *quintile*				
$\hat{\sigma}_{\epsilon,t-12}$	Lo	2	3	4	High
Lo	0.11	-0.06	-0.30	-0.43	-0.64
2	0.09	-0.06	-0.19	-0.25	-0.77
3	0.22	0.16	-0.06	-0.42	-0.96
4	0.18	0.15	0.03	-0.29	-0.95
Hi	0.26	0.06	0.24	-0.16	-0.83

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