Discussion of:

Expectations of Fundamentals and Stock Market Puzzles

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NBER Behavioral Finance — Virtual Meeting
15 May 2020

Columbia Business School

Outline

- This paper makes two key arguments:
  1. The predictability of the market return is driven by errors in the expectations of future cash flows
  2. These errors are largely the result of extrapolation of lagged earnings/dividend growth rates.
- Discussion Outline:
  - Review of the evidence on what drives market sentiment.
  - Evidence on fundamental-extrapolation:
    - . . . from cross-sectional tests.
    - . . . from (very preliminary) aggregate tests.

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  - Evidence on fundamental-extrapolation:
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Sentiment—Graham (1959)

. . . Imagine that in some private business you own a small share that cost you $1,000. One of your partners, named Mr. Market, is very obliging indeed. Every day he tells you what he thinks your interest is worth and furthermore offers either to buy you out or to sell you an additional interest on that basis. Sometimes his idea of value appears plausible and justified by business developments and prospects as you know them. Often, on the other hand, Mr. Market lets his enthusiasm or his fears run away with him, and the value he proposes seems to you a little short of silly. (The Intelligent Investor, Ch. 8)

Sentiment—Shiller (1981)

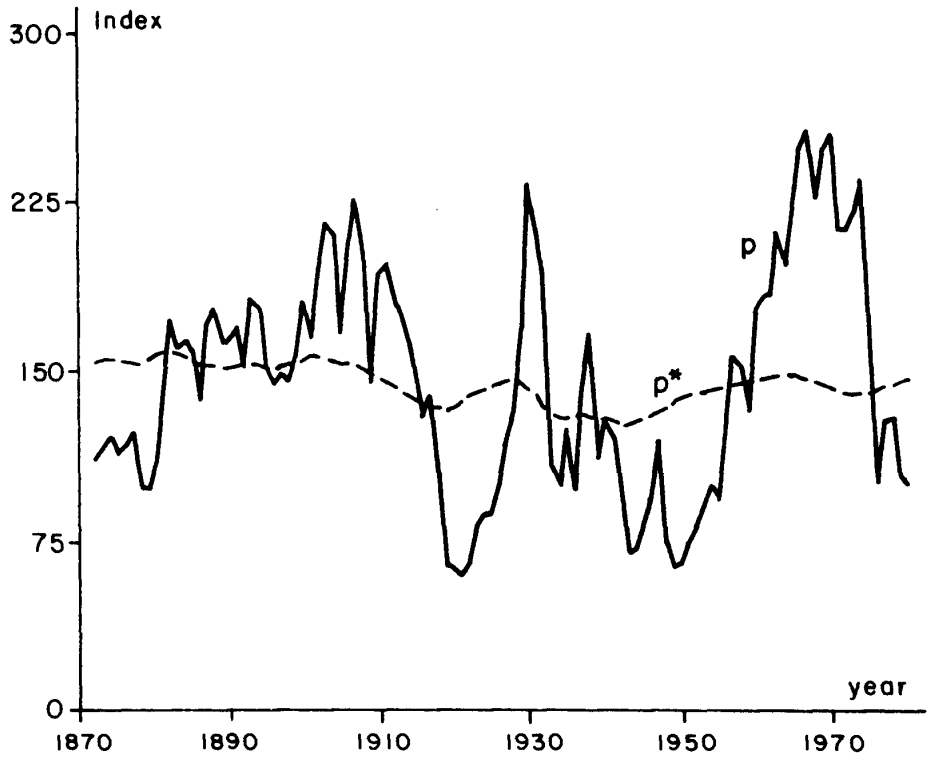


FIGURE 1

Note: Real Standard and Poor's Composite Stock Price Index (solid line p) and *ex post* rational price (dotted line p^*), 1871–1979, both detrended by dividing a long-run exponential growth factor. The variable p^* is the present value of actual subsequent real detrended dividends, subject to an assumption about the present

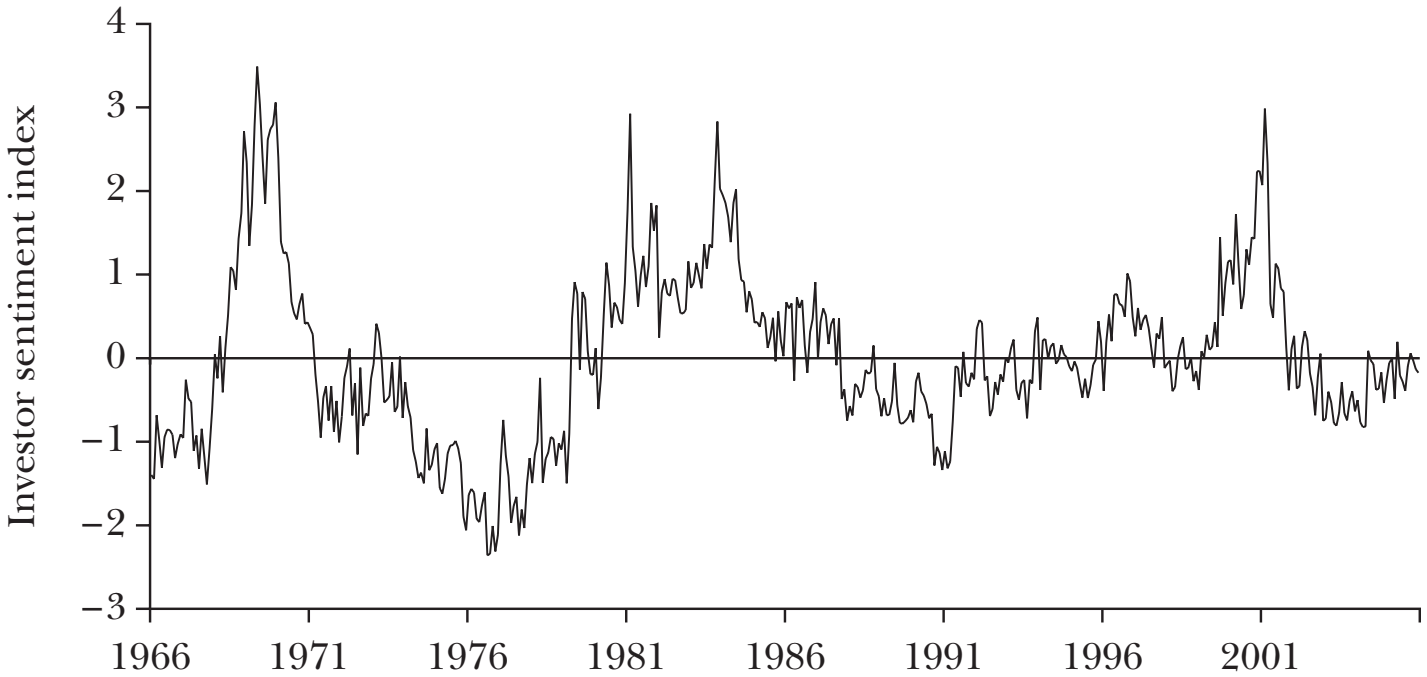
Sentiment—Baker and Wurgler (2007)

Figure 2

A Sentiment Index, January 1966 through December 2005

Panel A: Index of sentiment levels

$$SENT = -0.23\,CEFD + 0.23\,TURN + 0.24\,NIPO + 0.29\,RIPO - 0.32\,PDND + 0.23\,S$$



What *is* Sentiment? — LLSV (1997)

- La Porta, Lakonishok, Shleifer, and Vishny (1997) show that most of the return differential between value and growth stocks occurs on earnings announcement dates:[1]

	Intercept	Event Day Dummy	Market Return
Panel A: Regressions for Portfolios Formed on BM			
Low BM Portfolio Return	0.000128	−0.000661	1.0670
(Glamour)	(2.00)	(−3.44)	(73.08)
High BM Portfolio Return	0.001104	0.001945	0.6502
(Value)	(6.77)	(5.45)	(30.67)
Panel B: Regressions for Portfolios Formed on (CP, GS)			
Low CP, High GS Portfolio Return	0.000161	−0.000399	1.0276
(Glamour)	(2.40)	(−2.56)	(76.12)
High CP, Low GS Portfolio Return	0.000764	0.001769	0.6751
(Value)	(7.35)	(7.05)	(32.30)

- This is consistent with the hypothesis that investors are consistently overly-optimistic (pessimistic) about the earnings of growth (value) stocks.

What *drives* Sentiment? —La Porta (1996)

	WGS	BM(+)	Size	EP(+)	CP(+)	E{*e*(+)}	E{*g*}
Mean	−0.0359						
t-stat	−0.8148						
Mean		0.0106					
t-stat		0.3716					
Mean			−0.0004				
t-stat			−0.0242				
Mean				0.1658			
t-stat				0.5709			
Mean					0.0945		
t-stat					0.7165		
Mean						0.3488	
t-stat						0.9565	
Mean							−0.0882
t-stat							−4.9012
Mean		−0.0077	−0.0111				−0.0872
t-stat		−0.2957	−0.5458				−3.9928
Mean		−0.0197	−0.0114		0.0120		−0.0895
t-stat		−0.8462	−0.5858		0.1498		−4.1902

- La Porta (1996) shows that LTG *strongly* negatively predicts future returns
  - Note that La Porta (1996) also finds almost no difference in the historical growth rates of high- and low-expected growth firms.
  - In the end he concludes that "the evidence on the extrapolation hypothesis is mixed" (p. 1737)
    - The key evidence that supports the hypothesis is that value stocks (i.e., "past losers") have lower expected growth rates

Fundamental Extrapolation—DT (2006)

- Daniel and Titman (2006) search for fundamental-extrapolation in the cross-section of US stocks.
- The key tests are based on the identity:

$$bm_t \equiv \log\left(\frac{\mathrm{BE_t}}{\mathrm{ME_t}}\right) = bm_{t-\tau} + \log\left(\frac{\mathrm{BE_t}}{\mathrm{BE_{t-\tau}}}\right) - \log\left(\frac{\mathrm{ME_t}}{\mathrm{ME_{t-\tau}}}\right)$$

- The three components are:
  - The log-BM ratio τ (= 5 years) ago: $bm_{t-\tau}$,
  - The log-change in book-value: $\log(\mathrm{BE_t}/\mathrm{BE_{t-\tau}})$,
  - The log-change in market-value: $\log(\mathrm{ME_t}/\mathrm{ME_{t-\tau}})$.
- However, we adjust the growth rates in log-book and log-ME by a factor $\iota(t-\tau, t)$ that takes account of share issuance.
  - We also orthogonalize the stock returns to the fundamental growth measures.
- We then test which of these three components accounts for bm's forecast power for future returns
  - In addition to Book-value, we examine SaLeS, CashFlow, and EaRNings-based decompositions.

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Fundamental Extrapolation Evidence DT (2006)

- Fama MacBeth regressions show:

Const	bm_{t-5}	$r^{\mathrm{B}}(t-5,t)$	$r^{I(B)}$	$\boldsymbol{\iota}(t-5,t)$
1.202	0.057	-0.083	-0.300	-0.517
(4.60)	(0.87)	(-1.27)	(-3.14)	(-4.06)
Const	sp_{t-5}	$r^{\mathrm{SLS}}(t-5,t)$	$r^{I(S)}$	$\boldsymbol{\iota}(t-5,t)$
1.074	0.068	0.061	-0.300	-0.511
(4.15)	(1.44)	(1.13)	(-3.62)	(-3.80)
Const	cp_{t-5}	$r^{\mathrm{CF}}(t-5,t)$	$r^{I(C)}$	$\boldsymbol{\iota}(t-5,t)$
1.286	0.048	-0.052	-0.426	-0.457
(5.01)	(0.75)	(-1.20)	(-4.05)	(-3.78)
Const	ep_{t-5}	$r^{\mathrm{ERN}}(t-5,t)$	$r^{I(E)}$	$\boldsymbol{\iota}(t-5,t)$
1.250	0.037	-0.007	-0.403	-0.451
(4.88)	(0.62)	(-0.18)	(-3.81)	(-3.79)

Fundamental Extrapolation Evidence DT (2006)

- Fama MacBeth regressions show:
  - No significant relation with lagged fundamental growth

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Fundamental Extrapolation Evidence DT (2006)

- Fama MacBeth regressions show:
  - strong negative relation with return, orthogonalized to lagged fundamental growth

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Fundamental Extrapolation Evidence DT (2006)

- Fama MacBeth regressions show:
  - strong negative relation to share issuance

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1.202	0.057	-0.083	-0.300	-0.517
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Fundamental Extrapolation Evidence DT (2006)

- Some have expressed concern over the use of orthoganalized-returns rather than raw returns in these regressions.

Const	bm_{t-5}	$r^{\mathrm{B}}(t-5,t)$	$r(t-5,t)$
1.284	0.270	0.276	-0.372
(5.55)	(3.13)	(3.33)	(-3.99)
Const	sp_{t-5}	$r^{\mathrm{SLS}}(t-5,t)$	$r(t-5,t)$
1.102	0.162	0.285	-0.342
(4.63)	(3.12)	(5.08)	(-4.24)
Const	cp_{t-5}	$r^{\mathrm{CF}}(t-5,t)$	$r(t-5,t)$
1.997	0.309	0.261	-0.504
(8.56)	(3.82)	(4.59)	(-4.89)
Const	ep_{t-5}	$r^{\mathrm{ERN}}(t-5,t)$	$r(t-5,t)$
2.021	0.273	0.254	-0.486
(8.45)	(3.39)	(4.76)	(-4.64)

Fundamental Extrapolation Evidence DT (2006)

- Here are the Fama MacBeth forecasting regressions with returns rather than orthogonalized returns
  - Now, note that every measure of lagged fundamental growth has a statistically significant positive coefficient.
  - This shows that markets underreact to fundamental growth measures, relative to (unadjusted) returns.

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DP decomposition

- However, it is possible that fundamental growth measures don't forecast returns cross-sectionally, but do forecast market returns
  - This would suggest fundamental-extrapolation at the aggregate level, but not at the individual stock level.
- I'll show a set of regressions. Data is from Shiller, over the 1946-2014 sample.
- The dependent variable is always the annual real returns on the S&P 500 (R_{t+1})
- The forecasting variables I'll use are:
  1. dp: log of preceding year's dividend (D_t), scaled by this year's price (P_t)
  2. dpL: dp, lagged 10 years.
  3. Δd: change in the log dividend over the last 10 years.
  4. Δp: change in the log price over the last 10 years.
  5. S: Baker and Wurgler (2000) equity share

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An Information Decomposition

OLS Regression Results

Dep. Variable:	R	R-squared:	0.066
Model:	OLS	Adj. R-squared:	0.052
No. Observations:	67	AIC:	-51.62
Df Residuals:	65	BIC:	-47.21
Df Model:	1		
Covariance Type:	HAC		

	coef	std err	z	P>|z|	[0.025	0.975]
const	0.4165	0.157	2.657	0.008	0.109	0.724
dp	0.0983	0.046	2.128	0.033	0.008	0.189

- First note that over this period there is a statistically significant relationship between the dividend price ratio, $(d/p)_t$, and next year's real returns.

An Information Decomposition

OLS Regression Results

Dep. Variable:	R	R-squared:	0.026
Model:	OLS	Adj. R-squared:	0.011
No. Observations:	67	AIC:	-48.79
Df Residuals:	65	BIC:	-44.38
Df Model:	1		
Covariance Type:	HAC		

	coef	std err	z	P>|z|	[0.025	0.975]
const	0.0588	0.022	2.676	0.007	0.016	0.102
Delta-d	0.1254	0.084	1.487	0.137	-0.040	0.291

- the point estimate on the Δd coefficient is positive, not negative.
  - However, it is not statistically significant.

dp decomposition

- Now, let's run the regression (like that in Daniel and Titman (2006)):

$$r_{t+1} = \alpha + \gamma_0 \cdot dp_{t-10} + \gamma_1 \cdot \Delta d_{t-10,t} + \gamma_2 \cdot r^I_{t-10,t} + \gamma_3 \cdot S_t + \epsilon$$

  where $r^I_{t-10,t}$ is the residual from the (time-series) regression of the S&P return on dividend growth.
- At least post-WWII, *dp* forecasts the market.
  - *But which of the these components forecasts the market?*

An Information Decomposition

OLS Regression Results

Dep. Variable:	R	R-squared:	0.166
Model:	OLS	Adj. R-squared:	0.104
No. Observations:	59	AIC:	-47.27
Df Residuals:	54	BIC:	-36.88
Df Model:	4		
Covariance Type:	HAC		

	coef	std err	z	P>|z|	[0.025	0.975]
const	0.4251	0.185	2.293	0.022	0.062	0.788
dpL	0.0797	0.059	1.351	0.177	-0.036	0.195
Delta-d	0.1033	0.082	1.257	0.209	-0.058	0.264
r^I	-0.1589	0.057	-2.765	0.006	-0.272	-0.046
S	-0.5252	0.283	-1.858	0.063	-1.079	0.029

Omnibus:	1.482	Durbin-Watson:	1.905
Prob(Omnibus):	0.477	Jarque-Bera (JB):	1.193
Skew:	-0.132	Prob(JB):	0.551
Kurtosis:	2.355	Cond. No.	53.7

- The results are consistent with the results from the cross-section.
  - Price moves correlated with Δd don't reverse, but price changes orthogonalized to fundamental growth do reverse strongly ($t = -2.765$)

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Covariance Type:	HAC		

	coef	std err	z	P>|z|	[0.025	0.975]
const	0.6982	0.227	3.077	0.002	0.253	1.143
dpL	0.1585	0.068	2.318	0.020	0.024	0.293
Delta-d	0.3394	0.124	2.728	0.006	0.096	0.583
Delta-p	-0.1589	0.057	-2.765	0.006	-0.272	-0.046
S	-0.5252	0.283	-1.858	0.063	-1.079	0.029

- This show the same regression, except that here I use the raw return (ie., Δp) in place of r^I (Δp orthogonalized to Δd and to $(d/p)_{t-10}$)
- Note that, with this change, the coefficient on Δd is now more *postive*, and statisticaly significant.
  - This reflects the fact that Δd and Δp are strongly positively correlated.
  - Note also that the coefficient on Δp is the same as the coefficient on r^I in the last regression—as it has to be (mechanically)
- The interpretation is again that lagged price moves associated with fundamental don't reverse, while those uncorrelated with Δd do reverse.

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