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ARTICLES

Does Analyst Optimism About Future Earnings Distort Stock Prices?

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Monthly returns to firms with optimistic expectations are 1.5% lower versus firms with pessimistic expectations, while annual buy-and-hold returns to firms with optimistic expectations are 20% lower. The optimistic component of stock prices lingers months after the optimism is revealed to the market. It also exists separately from the component related to analyst forecast dispersion. The possibility that forecast dispersion is related to transitory versus permanent earnings is proposed.

Several recent studies find that analyst earnings forecast properties are related to stock returns.[1] Firms with low dispersion or low error outperform firms with high dispersion or high error. Some researchers believe that firms with highly dispersed forecasts tend to reflect the views of optimistic investors who are subsequently disappointed, causing these firms to suffer persistently low stock returns. Another possibility is that firms with losses have returns that are different from firms with profits (e.g., Ettredge and Fuller [1991]). Loss firms are associated with overwhelmingly optimistic forecasts and low transparency levels (Ciccone [2001]).

The purpose of this study is to examine the relation between optimistic expectations and stock returns. The testing analyzes three central issues: 1) the extent to which optimism is a component of stock returns, 2) the relation between any optimism component of stock returns and analyst forecast properties, and 3) the relation between any optimism component of stock returns and losses.

Optimism is measured using analyst forecasts. Analysts are important for several reasons: they are professional market watchers, and their judgments of stock and earnings performance are followed closely by investors (e.g., Brown and Rozeff [1978]; Crichfield, Dyckman, Lakonishok [1978]; Givoly and Lakonishok [1979]; Fried and Givoly [1982]; and Lys and Sohn [1990]). Importantly, analyst forecasts provide a human-level measure of investor sentiment.[2] Optimism is determined concurrently with returns. Although the measure cannot predict returns ex ante, it does indicate the extent to which optimism is impounded in stock prices.

Previous studies do not use a direct measure of optimism. For example, Ackert and Athanassakos [1997] and Dieter, Malloy, and Scherbina [2002] relate forecast optimism to the dispersion of analyst forecasts and show that the dispersion is related to stock returns. Other studies use either time series earnings estimates or analysts' forecasts of earnings growth rates (e.g., Lakonishok, Shleifer, and Vishny [1994]; Chan, Jegadeesh, and Lakonishok [1996]; LaPorta [1996]).

I use portfolio sorts and a Fama–MacBeth [1973] cross-sectional regression framework. The results clearly indicate a large optimism component of stock returns. Firms with optimistic expectations earn significantly lower returns; their annual buy-and-hold returns are on average 20% lower than firms without optimistic expectations. These lower returns occur in every sample year, with the smallest annual difference being 9.5%. The optimism component of returns exists independently of size and book-to-market components. The results are not confined to firms having high dispersion as is proposed in previous studies. Furthermore, the results are unrelated to loss firms.

The market appears to eliminate the optimism inherent in stock prices slowly. For example, during a month in which the previously held optimism should have been completely removed from the stock price, returns for optimistic stocks are still 0.92% lower on average (11.04% annualized).

The market reacts differently to the improved earnings of transparent firms (low dispersion or low error) versus opaque firms (high dispersion or high error). The possibility is raised that the market believes the improved earnings of opaque firms to be more transitory in nature versus the improved earnings of transparent firms.

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Stock Prices and Optimism

Behavioral models of stock returns allow for optimistic expectations (Barberis, Schleifer, and Vishny [1998], and Daniel, Hirshleifer and Subrahmanyam [1998]). Investors are thought to sometimes overestimate growth prospects, thus inflating stock prices. As the optimistic expectations are not fulfilled, the returns of these stocks are low.

Miller [1977] argues that optimism enters into stock prices because pessimistic investors are reluctant to sell short. Highly dispersed analyst earnings forecasts characterize firms having large differences in future expectations. Thus, these firms would have some investors who believe that future prospects are good, the optimists, and some investors who believe that future prospects are poor, the pessimists. Consistent with Miller [1977], pessimistic investors avoid such firms due to the risks or difficulties of short selling. Thus, optimistic investors drive the stock prices of firms with highly dispersed forecasts. Ackert and Athanasakkos [1997] and Dieter, Malloy, and Scherbina [2002] provide support for this theory when they find that high earnings forecast dispersion is associated with lower stock returns.

Other studies relate forecast properties to firm characteristics, such as profitability. Benesh and Peterson [1986], Butler and Saraglou [1999], and Ciccone [2001] show that firms with losses have significantly greater forecast dispersion, error, and optimism. Studies by Jaffe, Keim, and Westerfield [1988] and Ettredge and Fuller [1991] find that firms have high returns in the year after a loss. It is possible that loss firms affect stock returns by interacting with firms having highly dispersed or optimistic forecasts.

A different line of reasoning in explaining the relation of forecast properties to stock returns can be built upon research that has examined investor perceptions regarding the permanent and transitory components of earnings. Prior studies have documented, for example, differences in future earnings between firms initiating dividends and firms repurchasing stock (Jagannathan, Stephens, and Weisbach [2000]). Firms initiating or increasing dividend changes tend to signal a permanent shift in earnings. Firms repurchasing stock tend to signal a transitory shift.

Applied to forecast properties, investors may regard the positive earnings changes of transparent firms as more permanent than the positive earnings changes of opaque firms. Consistent with this theory, Ciccone [2001] finds that firms with volatile earnings tend to have higher dispersion and error and greater amounts of optimism.

Methodology

The price, share, and return data come from the Center for Research in Security Prices (CRSP), the book value data comes from COMPUSTAT (active and research files), and the analyst forecast data comes from the Institutional Brokers Estimate System (IBES) summary files. Portfolio sorts and Fama–MacBeth cross-sectional regression models test for an optimistic expectations component of stock returns.

The tests use a return period from July 1 of year *t* to June 30 of year *t+1*. Under efficient markets, as of July 1, year *t,* the prior year earnings information should be fully incorporated into the stock price. The overall return period covers 1977 through 1996.

Analyst annual earnings forecasts are used to determine optimism. Optimism is present when the mean annual earnings forecast is greater than the corresponding actual earnings. It is measured at December 31, year *t,* a point in time during the return period. Two loss dummy variables are included in the regressions, a loss defined as IBES earnings less than zero. A prior loss dummy, measured December 31, year *t–1,* is included because previous studies indicate prior-period losses affect future stock returns. A concurrent loss dummy, measured December 31, year *t,* is included to control for the relationship between optimism and losses.

The testing only includes firms with December 31 fiscal year-ends. This creates two distinct return periods: 1) July 1 through December 31, year *t,* before the actual annual earnings release, and 2) January 1 through June 30, year *t+1,* during which the actual earnings are released and when forecast optimism or pessimism is revealed. The results are similar if the sample is expanded to include firms with any fiscal year-end.

The variables using analyst forecast properties are forecast dispersion and error. Dispersion is measured every fiscal year for each sample firm using annual earnings forecasts. It is the standard deviation of all individual annual forecasts at December 31, year *t–1* (also the fiscal year-end). A firm must have at least two individual forecasts available for this measure to be computed. Error is also measured at December 31, year *t–1,* for each sample firm using annual forecasts. It is the absolute difference between the actual earnings and the mean of the individual earnings forecasts made in the last month of the fiscal year only. One forecast is required. Both the dispersion and error are measured prior to the return period, and they are referred to as transparency measures. Firms with high dispersion or high error are called "opaque," while firms with low dispersion or low error are called "transparent."

Prior research has found a relation among size, book-to-market ratio, and stock returns (e.g., Fama and French [1992]). Therefore, size and book-to-market ratio are controlled for.[3] Size is computed as price times shares outstanding at June 30, year *t*. Book-to-market ratio is computed at December 31, year *t–1*. Book value is defined as the book value of stockholders' eq-

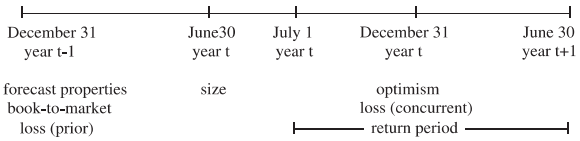
uity plus balance-sheet deferred taxes and investment tax credits minus the book value of preferred stock (COMPUSTAT items A60 + A74).

The cross-sectional model of Fama–MacBeth is reproduced with added forecast property variables, loss dummy variables, and optimism dummy variables. This model uses monthly returns as the dependent variable and individual firm characteristics, assigned annually, as independent variables. The regression is performed each month. The time-series averages of the slopes from the month-by-month regressions are divided by their time-series standard errors to compute t-values.

The monthly regression model is as follows:

$$\begin{aligned} R_i = {} & a + b\ \text{size}_i + c\ \text{book-to-market ratio}_i \\ & + d\ \text{forcast property}_i + e\ \text{optimism dummy}_i \\ & + f\ \text{prior loss dummy}_i + g\ \text{concurrent loss dummy}_i \\ & + \text{error term} \end{aligned} \quad (1)$$

The size, book-to-market ratio, forecast property, and prior loss dummy variables are measured prior to the return period. The optimism dummy and concurrent loss dummy variables are measured during the return period. Forecast property refers to either dispersion or error. A pictorial representation is provided below.



For all sample firms, optimism or pessimism is revealed sometime during the January 1 through June 30, *t+1* return period, during which the actual annual earnings are released. The final sample of CRPS, COMPUSTAT, and IBES-matched December 31 fiscal year-end firms is 22,716 firm-years. Of these, 11,389 have pessimistic forecasts and 11,327 have optimistic forecasts.

Results

Testing for an Optimism Component

Table 1 reports monthly return differences after sorting firms into pessimistic and optimistic portfolios. Over the entire July 1 through June 30 return period, pessimistic firms outperform optimistic firms by an average of 1.48% per month, clearly suggesting an optimistic component in stock prices. This out-performance occurs in every month, although the difference is larger during July through December (2.10% on average), a period before earnings are released and before optimism is revealed. Right when January begins, the superior returns to pessimistic firms are suddenly cut in half. Pessimistic firms still earn higher returns by 0.89% per month during the January through June return period, a period during which optimism is revealed, suggesting that the optimism component lingers. Even in June, a month in which any optimism should definitely have been recognized and removed from the stock price, the return difference is still 0.92%.

Table 1. *Mean Monthly Return Differences Between Optimistic and Pessimistic Portfolios*

Month	Mean Difference (%): Pessimistic Less Optimistic
All months	1.48*
July through December, *t*	2.10*
January through July, *t+1*	0.89*
July, year *t*	2.42*
August, year *t*	1.31*
September, year *t*	2.02*
October, year *t*	2.98*
November, year *t*	1.58*
December, year *t*	2.22*
January, year *t+1*	0.99*
February, year *t+1*	1.10*
March, year *t+1*	0.84*
April, year *t+1*	1.21*
May, year *t+1*	0.25°
June, year *t+1*	0.92*

Note: This table reports mean monthly percent return differences between optimistic and pessimistic portfolios for firms with December 31 fiscal year-ends. Equally-weighted portfolio returns are measured from July 1, year *t* to June 30, year *t+1*. The return period is 1977–1996. The * and ° indicate statistical significance with 99% and 95% confidence, respectively.

These results suggest that the market gradually notices and removes the optimistic price component prior to the actual revelation of the optimism. After the optimism is revealed, a considerable drift still occurs.

Fama–MacBeth cross-sectional models are utilized next. These models are critical for testing as they control for size, book-to-market ratio, and forecast dispersion or error.[4] The models also control for losses, both prior to and concurrent with the return period.

The results are presented in Table 2. The univariate models use only one independent variable at a time in the regression. The optimism dummy variable is significant in this specification. Its coefficient of –1.37 (t-value = –15.90) indicates that the returns to firms with optimistic expectations are significantly lower by 1.37% per month, a number consistent with the portfolio results in Table 1.

The multivariate models control for the other variables that have been previously shown to predict stock returns. Although size, book-to-market ratio, and the forecast properties are all significant in the regressions, the optimism dummy variable loses little of it explanatory power. Its coefficient is equal to –1.11 (t-value = –14.72) in the model using dispersion as an independ-

Table 2. *Fama–MacBeth Regressions*

Size	Book-to-Market	Dispersion	Error	Optimism Dummy	Prior Loss Dummy	Concurrent Loss Dummy
			Univariate Regressions			
–0.08	0.23	–0.20	–0.13	–1.37	0.09	–1.29
(–1.63)	(1.99)	(–4.16)	(–3.74)	(–15.90)	(0.33)	(–4.79)
			Multivariate Regressions			
–0.06	0.47	–0.24		–1.11	1.00	–0.99
(–1.23)	(3.39)	(–5.75)		(–14.72)	(3.58)	(–3.61)
–0.10	0.39		–0.14	–1.20	0.83	–1.16
(–2.13)	(3.12)		(–5.02)	(–15.83)	(3.67)	(–5.04)

Note: This table reports the average slopes from monthly Fama–MacBeth (1973) regressions using monthly percent stock returns as the dependent variables, with t-statistics reported in parentheses. See Table 1 and the text for sample details. The model is as follows:
$R_i = a + b \log (size)_i + c \log (book/market)_i + d \log (transparency\ measure)_i + e\ optimism\ dummy_i + f\ prior\text{-}period\ loss\ dummy_i +$

ent variable and –1.20 (t-value = –15.83) in the model using error.[5]

The dispersion and error variables retain their importance in the multivariate regression models, indicating that the transparency component of stock returns is unrelated to the forecast optimism component. This is contrary to the hypotheses of previous studies in which dispersion is used as a proxy for optimism.

Firm losses are also related to stock returns. The prior period loss dummy is significant in the regression using dispersion, with a coefficient of 1.00 (t-value = 3.58). Thus, firms with losses tend to have high stock returns in the following year. However, firms with losses during the stock return period tend to have low returns. Neither prior period nor concurrent period losses affect the optimism component of stock returns.

The loss dummy variable results are important for two reasons. For one, losses and optimism retain their significance when used together, despite their strong relation. In this sample, 79% of loss firms have optimistic forecasts. The second reason is that, consistent with previous research, prior losses predict future stock returns. Loss firm returns are high in the subsequent period suggesting market over-reaction.

Table 3 reports annual buy-and-hold returns to firms with and without optimistic expectations in each sample year. In every year, the pessimistic firms outperform the optimistic firms. The average differ-

Table 3. *Year-by-Year Annual and Six-Month Buy-and-Hold Returns for Portfolios Sorted by Optimism*

	Annual Buy-and-Hold Returns, July Year *t* Through June, Year *t+1*			Six-Month Buy-and-Hold Returns, July Through December, Year *t*		
Year *t*	Pessimistic	Optimistic	Difference	Pessimistic	Optimistic	Difference
1977	21.27	2.42	18.85*	4.76	–3.96	8.72*
1978	18.57	9.06	9.51*	2.38	–4.46	6.84*
1979	21.71	6.93	14.78*	13.12	3.75	9.37*
1980	42.96	25.59	17.37*	25.90	15.48	10.42*
1981	–5.20	–17.71	12.51*	–2.02	–9.81	7.79*
1982	101.35	66.17	35.18*	47.83	30.00	17.83*
1983	–0.84	–15.27	14.43*	3.42	–4.97	8.39*
1984	48.62	18.38	30.24*	18.09	1.19	16.90*
1985	52.27	20.90	31.37*	16.20	5.38	10.82*
1986	19.32	5.06	14.26*	–4.14	–12.10	7.96*
1987	3.16	–13.92	17.08*	–15 .70	–27.26	11.56*
1988	22.06	7.13	14.93*	2.34	–5.52	7.86*
1989	18.24	–7.30	25.54*	12.46	–2.33	14.79*
1990	16.19	–5.44	21.63*	–10.14	–23.33	13.19*
1991	30.92	7.70	23.22*	21.66	4.13	17.53*
1992	37.51	12.56	24.95*	21.31	7.25	14.06*
1993	11.82	–3.34	15.16*	13.77	3.49	10.28*
1994	29.68	9.18	20.50*	6.93	–4.60	11.53*
1995	38.54	12.83	25.71*	19.22	3.37	15.85*
Average	27.80	7.42	20.38*	10.39	–1.28	11.67*

Note: This table reports year-by-year annual and six-month buy-and-hold percent returns for optimistic and pessimistic portfolios. See Table 1 for sample details. The * indicates statistical significance with 99% confidence.

ence is 20.38%. The smallest difference is a still large 9.51% in 1978. The largest difference, 35.18%, occurs in 1982. There is no sign of this component being more or less powerful in any particular extended subperiod.

Examining the period during which optimism is not revealed to the market (July 1 to December 31), the results are quite striking. Pessimistic firms outperform optimistic firms by an average of 11.67% in only a six month time period, over half the total annual return difference.

Overall, the results provide evidence that firms with optimistic expectations have return properties that are fundamentally different. Their returns are persistently lower, both prior to and after their optimistic earnings are released. Prior to the earnings release, investors are consistently disappointed and remove a large portion of the optimistic component from the stock price. Yet, investors remain optimistic. After the earnings release, either investors continue to misunderstand future prospects, or they are slow to fully remove the optimistic component from the stock price.

Another Theory for Dispersion and Error

Potentially, information quality and earnings quality are related, earnings quality meaning not only the level of earnings but also the permanence of the level and the probability of future increases. Thus, the market may view firms with low dispersion or low error as having better earnings quality.

Although a complete analysis is beyond the scope of this paper, prior research provides support for this theory. For example, opaque firms are associated with lower levels of earnings and greater earnings volatility (Ciccone [2001]).

Table 4 examines this issue. The table presents annual buy-and-hold stock returns for portfolios that are sorted by the transparency measures and by earnings change percentage. The results show that for a given level of earnings change, transparent firms outperform opaque firms. The difference is often quite large. For example, in the portfolio of firms that have earnings increases of 75% to 100%, transparent firms return an average of 22.02% higher than the opaque firms.

Using logic from the dividend discount growth model, if two firms have the same increase in earnings in the current year, the stock price will increase more for the stock that is expected to have greater earnings in future years. Because firms with low dispersion or low error have the greater increase in price, it is possible that the market views these firms as having either higher earnings growth rates or a more permanent shift to the higher earnings level.

Conclusion

The results demonstrate that investor optimism is reflected in stock prices. As the investors become disappointed, the stock returns are significantly lower than firms without such expectations. Thus, investor sentiment and behavior does appear to play an important role in the stock market. Optimism does not interact with analyst forecast properties in affecting stock returns. The relation between optimism and stock returns is also unaffected by losses.

Table 4. *Stock Returns by Earnings Changes and Transparency Portfolios*

	Annual Buy-and-Hold Stock Returns by Earnings Change Portfolio						
	Earnings Decrease	Improvement From Negative Earnings	Improvements From Positive Earnings				
			0–25%	25–50%	50–75%	75–100%	> 100%
			Dispersion				
Transparent	14.51	39.16	18.73	27.41	34.11	38.74	37.42
2	10.80	13.78	14.57	18.82	17.59	20.34	22.50
Opaque	5.93	18.41	13.36	13.83	15.48	16.72	16.58
Diff (T – O)	8.58*	20.75*	5.37	13.58*	18.63*	22.02*	20.84*
			Error				
Transparent	13.79	36.23	18.79	31.24	34.71	45.86	45.37
2	11.92	23.98	16.76	22.80	27.94	26.72	23.98
Opaque	6.02	18.91	14.91	16.87	18.28	19.78	19.47
Diff (T – O)	7.77*	17.32*	3.88	14.37*	16.43*	26.08*	25.90*

Note: This table reports stock percent returns by earnings change and transparency portfolios. At the end of June of year *t,* stocks are ranked by prior fiscal period dispersion and error and then placed into portfolios based on those rankings. Stocks are further sorted by changes in annual earnings from fiscal year-end *t–1* to fiscal year-end *t*. Buy-and-hold returns are measured from July 1, year *t* through June 30, year *t+1* for each portfolio. The return period is 1977–1996. The * indicates statistical significance with 99% confidence.

Stocks that have optimistic expectations can be systematically identified: the market tends to overestimate the future earnings of firms expecting losses. Additionally, the market does not appear to entirely eliminate the optimistic component of the stock price as the return difference between firms with and without optimistic expectations continues even after the optimism should have been revealed.

Future research can directly address the market efficiency issues, perhaps providing investor sentiment measures with better return predictive potential. Also, the findings imply the optimism is engendered at a previous, but unidentified point in time. Research can explore the initial causes of the optimism and when the optimism is first reflected in stock prices.

Finally, a new proposal is put forth to help explain the reason why opaque firms might underperform versus transparent firms. The market reacts less positively to earnings increases of opaque firms, potentially reflecting the more transitory nature of their earnings.

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Notes

1. For example, Ackert and Athanassakkos [1997], Ang and Ciccone [2001], Dieter, Malloy, and Scherbina [2002], and Dische [2002].
2. In some of the first papers to document systematic optimism, DeBondt and Thaler (1985, 1990) mention the importance of human irrationality in explaining anomalous market behavior.
3. Momentum is also controlled for using a simple momentum indicator, the six-month return prior to the return period. Adding the variable has no effect on the results.
4. See note 3.
5. A prior period optimism variable, measured at December 31, year *t–1,* is also added to the regression model. This variable helps control for any over- or under-reaction related to previously found optimism. The variable is insignificant in the multivariate regressions.

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