What do economists know about the stock market?

They very much lack predictive power for the direction and the magnitude of stock market changes.

Werner F. M. De Bondt

Recent studies in finance find that changes in stock prices are somewhat predictable and not random. Major stock market indexes such as the Standard & Poor's index (S&P) or the Dow Jones Industrial Average are mean-reverting over long horizons. That is, after a three- to five-year bull market, a future decline is more likely than continued upward movement.

Conversely, after a major market decline, the chances of a turnaround exceed those of further decline. For shorter horizons, similar negative autocorrelation in returns occurs but only when the initial price change is extreme, more than 3% up or down within one day, for example. (For a review, see De Bondt and Thaler [1989].)

The evidence was uncovered in tests of the efficient market hypothesis against a psychological alternative, the overreaction hypothesis. The tests were motivated by the work of Kahneman and Tversky [1973] on heuristics and biases and by older studies of the price/earnings (P/E) ratio anomaly, as well as by the immediate fact, evident to everyone, that asset prices are extremely volatile. Indeed, over the years, Shiller [1990] has convinced all but a few that stock prices are *excessively* volatile relative to well-known dividend discount models.

While the efficient markets view claims that stock prices quickly and rationally reflect all public information (so that stock prices follow a stochastic process close to a random walk), the overreaction hypothesis admits to temporary disparities between prices and fundamentals. Prices misbehave because many "noise traders" violate Bayes' Theorem and overreact to new information. Rational "information traders" can do little to counterbalance the behavior of noise traders and they may not want to, anyway (De Long et al. [1989, 1990]). As a result, prices overshoot. Eventually, however, they get corrected as actual future events predictably turn out to be either less rosy or more pleasant than originally thought. This price behavior explains the profitability of contrarian strategies: Contrary to market efficiency, prior stock market "losers" are much better investments than prior "winners" (De Bondt and Thaler [1985]).

In the debate about whether the data may still be consistent with market rationality — e.g., because risk premiums predictably vary through time (Fama and French [1988]) — one approach is to study the behavior of so-called smart money. The arguments for market rationality lose force if those traders whom we normally think of as sophisticated display the same biases as do naive subjects in controlled experiments.

For example, De Bondt and Thaler [1990] find that, consistent with overreaction, security analysts' forecasts of company earnings changes are systematically too extreme. When a large earnings increase is forecasted, actual earnings are predictably lower than expected. On the other hand, when a large decrease is seen, earnings beat expectations.

WERNER F. M. DE BONDT is Visiting Assistant Professor of Finance at the Johnson Graduate School of Management of Cornell University in Ithaca (NY 14853). He is on leave from the University of Wisconsin-Madison. He thanks Kent Womak. Robin Keller, and seminar participants at Cornell University for interesting comments. He also thanks Henry Min at the Federal Reserve Bank of Philadelphia for providing data and the Graduate School of the University of Wisconsin-Madison for research support. An earlier version of this paper was presented at the Behavioral Decision Research in Management Conference (Philadelphia, June 1990).

This article focuses on a different group of investment professionals: expert economic forecasters. The data come from the well-known Livingston surveys.[1] I examine about 5400 individual forecasts of the S&P index of 425 industrial companies for the period between 1952 and 1986. They are for horizons of seven and thirteen months. The stock market predictions deserve our attention in part because of the prominence of the forecasters. During the late 1960s and early 1970s, the institutions they advised "accounted for over 60 percent of all stock exchange trading" (Lakonishok [1980]).

There are three main findings. First, the average forecast has no predictive power and is useless for purposes of investment strategy. Nevertheless, there are clear patterns in what the experts do: In particular, they "overreact," and their forecast errors are systematic. The errors are related to the market price/earnings ratio and to expected inflation. Finally, and perhaps most surprisingly, the predictions are strongly mean-reverting. Thus, the survey evidence confirms that expected returns vary through time. Apparently, economists have had little faith in the random walk theory for thirty-five years!

DATA

For almost forty years, Joseph Livingston — a journalist with the *Philadelphia Enquirer* — and, more recently, the Federal Reserve Bank of Philadelphia have collected various stock market forecasts from academic, business, and government economists. Early June and early December of each year since 1952, about forty economists predict the level of the S&P that will prevail at the end of the following June and December. The expectations, which are available on computer tape, can be compared with actual levels of the S&P that appear in Standard & Poor's 1988 *Security Price Index Record*.

The economists also predict about ten macroeconomic variables, two of which I link later on to expected stock returns: the consumer price index and industrial production (seasonally adjusted). I transform the series into annual percentage expected growth rates. The base levels are the April or October numbers so that the macroeconomic forecasts are over either eight or fourteen months.[2] The actual CPI and industrial production statistics are made available by *Citibase*.

ECONOMISTS AGREE: WHAT GOES UP MUST COME DOWN

Obviously, to make predictions, the economists have much more information than past levels of the Standard & Poor's Index. Nevertheless, if the economists believe in (strong-form) efficient markets, a reasonable approach is to ignore that additional information and to start from the last-known number of the S&P, say, the closing level (in points) on the day before the forecast (P_0). Next, they could add x points so that x/P_0 equals the average past seven- or thirteen-month percent price appreciation on the securities in the index. (Note that the index does not include returns that are paid as dividends.)

Clearly, with efficient markets, the economists should never expect the index to fall.[3] Still, that is what often happens. Between June 1952 and December 1986, there are seventy forecast dates. I rank the dates by the prior performance of the S&P. Performance is measured over either three, six, twelve, twenty-four, or thirty-six months. Table 1 reports ex-

TABLE 1

Stock Return Forecasts in Bull and Bear Markets, 1952–1986

Length of Bull/Bear Market (1)	Past S&P Return (2)	Expected 7-Month Return (3)	Expected 13-Month Return (4)	% of Economists Who See a Trend: UPWARD (5)	UPWARD (6)	DOWNWARD (7)	DOWNWARD (8)	Actual 7-Month Return (9)	Actual 13-Month Return (10)
Bull Markets									
3 months	+13.05	0.16	2.30	49.6	43.0	31.5	11.0	8.44	11.26
6 months	+22.63	−3.07	0.39	45.0	39.3	37.6	15.5	14.62	9.16
12 months	+34.90	−2.59	−0.45	43.6	36.2	38.3	16.7	5.73	6.44
24 months	+55.23	−5.53	−2.10	36.5	29.3	41.4	17.7	6.44	1.36
36 months	+72.30	−6.39	−4.29	28.2	21.8	52.6	30.7	8.50	5.26
Bear Markets									
3 months	−8.48	2.02	3.45	50.3	44.3	31.5	19.6	0.08	4.59
6 months	−12.31	6.16	7.70	66.8	60.5	18.7	8.5	6.45	10.02
12 months	−16.42	5.24	7.71	62.9	59.0	21.2	7.7	6.95	12.00
24 months	−14.17	6.02	7.99	68.4	63.5	17.6	8.7	15.09	15.94
36 months	−11.06	7.27	8.56	69.8	65.4	17.8	7.0	16.27	14.53

Notes: The returns in Column 2 are measured over three to thirty-six months. The returns in Columns 3, 4, 9, and 10 are annualized. Columns 6 and 8 list the percent of subjects who perceive "strong" trends. Columns 5 and 7 list the percent of economists who see "weak" trends.

pected (x/P_0) and actual ($[P_1 - P_0]/P_0$) annualized returns for forecast dates that follow the ten most extreme bull markets and the ten most extreme bear markets. The level of the S&P in the base period, P_0, is for the last trading day of May or November.

As the table shows, after three-year bull markets, economists predict that on average, over the next seven months, the S&P will decline at an annual rate of 6.4%. This pessimism is not borne out by the facts even though actual returns are definitely smaller after large price run-ups than after market declines. See Figure 1.[4]

I also classify the economists by the type of trend they perceive, if any. I define "strong" and "weak" trends. Denoting seven-month forecasts by F7 and thirteen-month forecasts by F13, a *weak* upward trend is defined by $F7 > P_0$ and $F13 > P_0$, and a *strong* upward trend has $F13 > F7 > P_0$. Downward trends are defined in parallel fashion: For a weak downward trend, $F7 < P_0$ and $F13 < P_0$, while, for a strong trend, $F13 < F7 < P_0$.

Columns 5 through 8 in Table 1 confirm in a different way that professional economists expect reversals in stock prices. After three-year bull markets, on average, 52.6% of the subjects see a weak downward trend. The equivalent number for three-year bear markets is only 17.8%. Note also that, in this case, fully 65.4% of the economists see a strong upward trend.

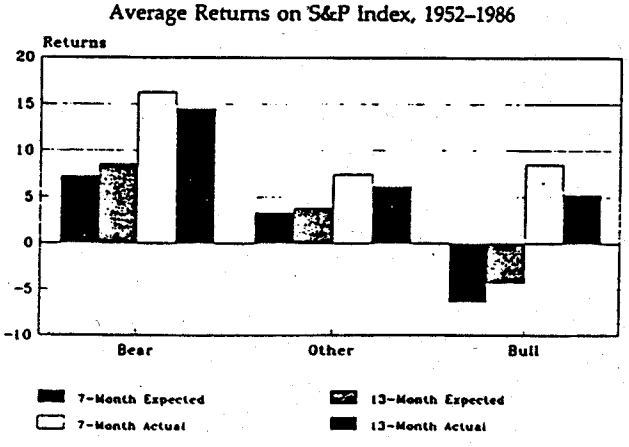
The results are quite surprising. The research findings on mean-reversion in stock prices are only recent and were almost certainly unknown to the survey participants. Why is the average economist a contrarian, pessimistic in bull markets and optimistic in bear markets?[5]

One possibility is that expectations have to do with the changing outlook for the U.S. economy. The top panel of Table 2 reports average expected returns (ERET), expected inflation (EINF), and expected growth in industrial production (EGIP) in bull and bear markets. Clearly, as the t-statistics for differences in sample means indicate, the economists expect more inflation following bear markets. After some initial delay, they also expect economic growth to pick up. On the other hand, after bull markets, the average forecaster expects the economy to cool off.

Another way to make this same point is to contrast the economic outlook of survey participants who are "strong" trend followers (i.e., they expect a continued strong upward trend after bull markets and a strong downward trend after bear markets) with the outlook of "strong" contrarians. I do this in Table 3. In bear markets, contrarians expect both more inflation and more economic growth than trend followers. Yet in bull markets, expected inflation and expected growth in industrial production are significantly lower for contrarians.

FIGURE 1

THREE-YEAR BULL VS. BEAR MARKETS
Average Returns on S&P Index, 1952–1986



Note: All returns are annualized

TABLE 2

Average Forecasts of Stock Returns, Inflation, and Economic Growth in Bull and Bear Markets, and in High P/E and Low P/E Markets

	All Other	Bear Markets	Bull Markets	Bull Vs. Bear t-statistic
ERET7	3.22	7.07	−6.94	−11.4
ERET13	3.32	7.91	−5.15	−15.1
EINF8	2.49	4.91	1.89	−15.7
EINF14	2.55	4.94	1.71	−17.2
EGIP8	2.94	1.86	1.43	−1.2
EGIP14	2.91	3.11	0.84	−8.1
	All Other	**Low P/E Markets**	**High P/E Markets**	**High Vs. Low P/E t-statistic**
ERET7	2.00	2.00	4.47	2.4
ERET13	2.13	5.87	3.55	−3.3
EINF8	2.54	3.78	1.92	−9.1
EINF14	2.64	3.45	2.14	−6.5
EGIP8	2.99	1.16	2.99	5.6
EGIP14	2.83	1.31	3.87	10.9

Notes: ERET7 is the (annualized) expected seven-month return on the stocks in the S&P Index. ERET13 is the expected thirteen-month return. EINF8 is the (annualized) expected eight-month inflation rate. Similarly, ERET14 is defined as the expected fourteen-month rate. EGIP8 is the (annualized) expected eight-month growth in industrial production. EGIP14 is the equivalent fourteen-month rate.

TABLE 3

Average Forecasts of Inflation and Economic Growth: Trend Followers and Contrarians

	Bear Markets			Bull Markets		
	Uptrend	Downtrend	t-stat.	Uptrend	Downtrend	t-stat.
EINF8	5.00	3.40	3.1	1.80	0.14	5.7
EINF14	5.07	3.60	2.6	1.99	−0.39	7.7
EGIP8	2.54	1.09	1.4	2.82	−1.62	6.2
EGIP14	4.00	0.05	3.8	2.94	−3.15	10.1

Notes: The variables are defined as in Table 2. The t-statistics test for differences in sample means.

A puzzle that remains is why the *average* expert thinks that his or her economic forecast allows prediction of market prices. There seem to be at least two possible explanations, most easily understood if we think of stock prices as sums of properly discounted cash flows (E) that last in perpetuity, $P = E/\rho$.

Consider the case of a bear market. One reason why prices may be expected to rise is that ρ, the (rationally) *required* return on equity, falls with improving economic conditions. This is consistent with demand-side stories of aggregate stock price movements (Shiller [1984]).

The alternative explanation is based on (strong-form) market inefficiency: The improving economy is bound to increase corporate profits and eventually raise stock prices, but the appreciation will occur only as soon as the average investor, now mired in pessimism, sees a turning point. In other words, the contribution of economic experts is to anticipate this whole scenario and to exploit their superior insight.

DO ECONOMISTS OVERREACT?

The story is too good to be true. In fact, economists are of little help in predicting the S&P. I demonstrate this by regressing actual seven- or thirteen-month returns (ARET) on the corresponding expected returns, $ARET_t = \alpha_1 + \beta_1 ERET_t + \mu_t$. For the forecasts to be useful, we would hope that the regression's R^2 is substantial. Even if our hope proves futile, the regression still allows for some inferences about how expectations are formed. Rationality requires that the forecasts be unbiased: $(\alpha_1,\beta_1) = (0,1)$. But, as already mentioned, the study of other financial experts suggests that the economists may be insufficiently regressive and that they "overreact." On the basis of flimsy information, the forecasters go out on a limb and find to their chagrin that — if the constant term in the regression is ignored — actual returns amount to only a fraction of expected returns: $\beta_1 < 1$.

An equivalent and perhaps more intuitive way to test for unbiasedness is to compute the *forecast error*, $ARET_t - ERET_t$, and to regress this "surprise" return on the forecast, $SURET_t = \alpha_2 + \beta_2 ERET_t + \mu_t$. Obviously, under rationality, forecast errors should never be a predictable fraction of the forecasts themselves! Thus, one expects that $(\alpha_2,\beta_2) = (0,0)$. But overreaction suggests that the predictions are systematically too extreme: Actual returns are less than expected returns if the market is expected to rise and more than expected returns if a decline is predicted. As a result, β_2 is significantly below zero.

Table 4 confirms that the forecasts are systematically excessive. All the regressions in this table are based on the average seven-month S&P predictions for every forecast date between June 1952 and December 1986. The R^2 of Equation (1), with actual returns as the dependent variable, shows that the economists have no predictive power whatsoever with respect to the Standard & Poor's Index. Relative to the null hypothesis that $\beta_1 = 1.0$, the t-statistic is -3.3.

TABLE 4

Testing for the Rationality of the S&P Return Forecasts

Independent Variables	Regression Equation Number (1)	(2)	(3)	(4)	(5)	(6)
Constant	8.83	56.55	56.53	−0.87	8.83	57.41
	(3.3)	(4.2)	(4.1)	(−0.2)	(3.3)	(3.9)
ERET7	0.00	—	0.02	—	−1.00	—
	(0.0)		(−0.1)		(−3.4)	
EINF8	—	−3.01	−3.00	0.46	—	−3.47
		(−2.8)	(−2.7)	(1.1)		(−3.0)
EGIP8	—	0.43	0.43	0.43	—	−0.00
		(0.8)	(0.8)	(2.2)		(−0.0)
P/E	—	−2.38	−2.38	0.28	—	−2.65
		(−3.2)	(−3.1)	(0.9)		(−3.3)
HISRET	—	−0.21	−0.22	−0.12	—	−0.09
		(−2.1)	(−2.0)	(−3.2)		(−0.8)
D.W.	1.80	1.70	1.70	1.60	1.80	1.70
Adj. R-sq.	−0.01	0.12	0.10	0.22	0.13	0.23

Notes: t-statistics are in parentheses. Variables are defined in the text. The dependent variable for Equations (1), (2), and (3) is ARET7. It is ERET7 for Equation (4), and it is SURET7 for Equations (5) and (6).

However, it is quite possible to predict the economists' errors. See Equation (5) where the seven-month forecast error is the dependent variable. Fully 100% of the predicted change in the S&P is in error: $\hat{\beta}_2 = -1.0$! Overall, actual returns exceeded expected returns by on average 8.8% per year.[6]

The results are robust. I tried many variations on the research design that are not reported here. For example, none of the findings in Table 4 changes if the 1952–1986 period is broken into two subperiods, before and after December 1969. The results are similar for the thirteen-month forecasts.

By comparing seven- with thirteen-month expected returns (i.e., ERET7 with ERET13), I can find the implicit six-month predictions for the period starting seven months after the forecast date (denoted as ERET6 + 7). The basic findings also apply here. For the thirteen-month forecasts as well as for ERET6 + 7, $\hat{\beta}_2$ is statistically indistinguishable from -1.0. As before, a substantial part of the variation in the forecast errors is explained by the forecasts themselves, but they do not have any predictive power for actual returns.

Finally, I studied (properly annualized) *forecast revisions* of the six-month return, seven months out, i.e., I subtract ERET6 + 7 from the seven-month expected return *for the next forecast date*. Rationality says that forecast revisions (just like forecast errors) should not be predictable from the forecasts themselves. Still, a regression of the forecast revisions on ERET6 + 7

has an adjusted R^2 of 0.34 and a slope coefficient that equals −0.95. This is consistent with overreaction because it is known in advance that the economists will be forced to reverse their original predictions.

THE SOURCES OF IRRATIONALITY

If the experts' forecasts are indeed systematically out of line, it would be interesting to know what causes the excessive optimism or pessimism. Asset returns are widely reported to be linked to interest rates, deviations between price and fundamental value, and other factors.[7] I focus on four variables suggested by this earlier work: expected inflation, expected real economic growth, the S&P price/earnings ratio on the forecast date (P/E), and three-year cumulative historical returns immediately prior to the forecast (HISRET).

At least since Fama and Schwert [1977] we know that actual stock returns respond negatively to nominal interest rates and expected inflation. But it is sometimes said that the relationship is spurious because higher inflation is associated with lower expected growth in GNP and industrial production (Fama [1981] and Kaul [1987]). On the other hand, the market's price/earnings ratio and the historical return variable fit in naturally with the research on mean-reversion (Fama and French [1988] and De Bondt and Thaler [1985]).

The choice of factors is motivated by the debate about market rationality. The predictability of returns probably has two sources: rationally time-varying risk premiums and systematic market expectational errors. Without direct observation of the market expectation, however, it is impossible to determine the relative importance of either force. The regression evidence below has one of three dependent variables: 1) actual, 2) expected, or 3) unexpected stock returns.

If the economists' forecasts were to proxy for the *market* expectation (with, admittedly, some survey measurement error), then the second set of regressions describes the time variation in market expected returns, while the error patterns found by the third set capture the nature of market irrationality. A narrower interpretation is simply that I describe how the economic experts' forecasts and their errors move with the four listed factors.

Equation (2) in Table 4 shows that actual seven-month returns are significantly negatively related to expected inflation, the S&P price/earnings ratio, and three-year historical returns. About 12% of the time variation in actual returns is explained. Nothing is gained by adding the forecasts on the right-hand side of the regression equation. (See Equation (3).) The negative signs for P/E and three-year historical returns are expected, but it is interesting that expected inflation depresses returns even after expected real growth in industrial production is controlled for. This contradicts Fama [1981]. If stocks were a good hedge against inflation, the beta coefficient should be indistinguishable from +1.0.[8]

Equation (4) relates expected seven-month returns to the same four variables. Expected returns increase with expected real growth, and they decrease with HISRET. These effects match the signs of Equation (2). The beta coefficient on the historical return variable confirms my earlier finding that the economists reduce their forecasts after big bull markets. Equation (4) holds two major surprises, however. First, the economists apparently do not recognize that inflation drives down returns. Second, they ignore the P/E indicator.

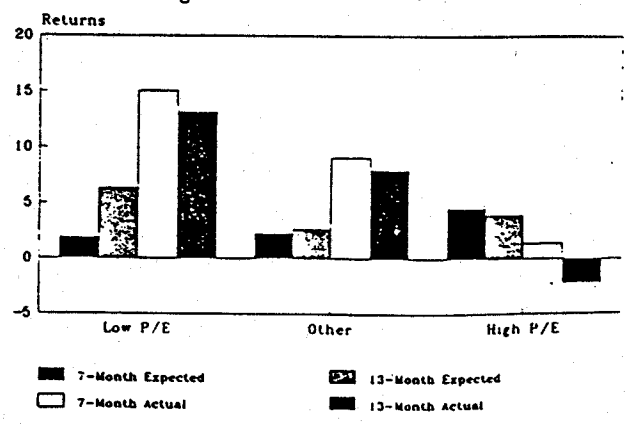
Obviously, both observations lead to predictable errors, as Equation (6) shows. The seven-month return forecast error — earlier defined as ARET7 - ERET7 — is now the dependent variable. By construction, the coefficients of Equation (6) mirror those of Equation (2) after subtracting the estimates of Equation (4).[9] Almost one-quarter of the variation in the forecast errors is explained. Actual returns systematically fall below anticipated returns if expected inflation (or, alternatively, short-term interest rates) and the P/E ratio are high.

A dramatic graphical illustration of this last phenomenon is shown in Figure 2. I rank all seventy forecast dates by the P/E level, classifying the ten dates with the highest (lowest) number as "high (low) P/E markets." Optimism about the market's near-term future seems to grow with the level of the P/E, while actual returns drop. As a result, the economists' errors explode.

I checked the robustness of the results in Table 4 in many ways. They do not change for thirteen-month returns.[10] I considered various subperiods and ran regressions based on the individual forecasts. Every time, the forecast errors are predictable from

FIGURE 2

HIGH P/E VS. LOW P/E MARKETS
Average Returns on S&P Index, 1952–1986



Note: All returns are annualized

expected inflation and from the market's price/earnings ratio.

It is interesting to speculate why the survey participants' forecast errors are predicted by expected inflation and the P/E ratio. *What is it that people do wrong?* De Bondt and Bange [1990] use the Livingston data to show that money illusion helps to predict price movements in the bond market. Inflation is systematically underpredicted when it is relatively high and rising, and inflation is overpredicted when it is falling. As a consequence, U.S. government bonds are poor (excellent) investments when the rate of inflation is going up (down). Stated somewhat differently, long-maturity instruments tend to do poorly when short-term interest rates are high (see also Froot [1990]). Equation (6) simply suggests that a similar effect occurs with stocks.

More difficult to interpret is the role of the market's price/earnings ratio. This ratio seems a natural measure of investor sentiment and the deviation between "value" and "price." Yet finance textbooks also suggest that the variable is linked to investors' beliefs about real interest rates and economic growth. With respect to the factors that I consider in Table 4, it is useful to know that simple Pearson correlations between EINF8, EGIP8, P/E, and HISRET are not statistically significant (even at the 10% level) except for three: $\rho_{EINF8,HISRET} = -0.39$, $\rho_{EINF8,P/E} = -0.50$, and $\rho_{EGIP8,P/E} = 0.35$.

The last two correlations are illustrated in the bottom panel of Table 2. This panel finds "high" and "low" P/E markets in the same way as does Figure 2. In high P/E markets, the economists project below-average inflation and average or above-average real economic growth. In contrast, when the P/E is low, expected inflation is unusually large and expected growth unusually small.[11]

As it turns out, the projections for inflation were more or less on target, but the forecasts for industrial production were clearly mistaken. In high P/E markets, actual eight-month growth *exceeded* expected growth by 4.8%, a very large number! In low P/E markets, actual eight-month growth fell 2.5% *below* expectations. As returns are *negatively* related to price/earnings-ratios, these results are extremely puzzling, and the ritual cry for further research seems appropriate.

ECONOMISTS' PREDICTIONS AND STOCK MARKET TIMING

We have learned that generally economists are aware of the mean-reversion in stock market indexes and that their forecast errors are not explained by whether we are in a bull or a bear market. The errors *are* systematic, however, showing too much optimism in high P/E markets and with rising inflation. A practical question of investment strategy is whether, on balance, the forecasts are still useful if we ignore the magnitudes of the return predictions and focus on what may be the economists' strength: their ability to spot turning points.

In Table 5, I count the number of "up" and "down" predictions in bull, bear, and other markets and I mark each forecast either as "correct" (if the market moved in the direction that was predicted) or "false." The base level of S&P is the close on the last trading day in May or November. As before, bull market forecasts are defined as those that follow the ten largest three-year rises in the S&P between 1952 and 1986. Similarly, bear market forecasts follow the ten biggest declines. In total, there are 5,465 seven- and thirteen-month predictions. On average, 62.2%

TABLE 5

Forecast Error Analysis

	Number of Forecasts (1)	Up Corr. (2)	Up False (3)	Down Corr. (4)	Down False (5)	% False Forecasts (6)	% Down Markets (7)	AVE (8)	MABE (9)
Seven-Month S&P Forecasts									
Bull	369	109	35	86	139	47.2	30.0	14.1	22.8
Other	1984	813	482	225	464	47.7	36.0	4.1	19.9
Bear	382	202	74	4	102	46.1	20.0	8.7	25.4
All	2735	1124	591	315	705	47.4	32.9	6.1	21.1
Thirteen-Month S&P Forecasts									
Bull	370	79	50	112	129	48.4	40.0	9.4	15.8
Other	1979	801	561	205	412	49.2	38.0	2.6	15.6
Bear	381	275	30	5	71	26.5	10.0	6.8	12.1
All	2730	1155	641	322	612	45.9	34.3	4.1	15.1

Notes: The number of forecasts that expect an increase in the S&P are listed in Columns 2 (correct predictions) and 3 (false predictions). The number of forecasts of a decrease appear in Columns 4 and 5. Column 6 equals Column 3 plus Column 5, divided by Column 1. AVE is the average forecast error per year, MABE is the mean absolute forecast error.

are "up," but that percentage rises to 76.2% in bear markets and falls to 36.9% in bull markets.[12]

Significantly less than half of the seven- and thirteen-month forecasts are false: 47.4% ($p < 0.01$) and 45.9% ($p < 0.0001$). See Column 6. Even a naive observer of history — who remembers only that the market rises more frequently than it falls — would easily beat the economists' forecast performance by predicting an increase 100% of the time. As Column 7 shows, the error rate of this strategy is 32.9% for seven-month forecasts and 34.3% for thirteen-month forecasts. The average error (AVE) of the economists' seven-month forecasts is 6.1%, and their mean absolute error (MABE) is 21.1%.

By way of comparison, a forecaster who guesses that stock prices always rise at the same rate — say, the arithmetic average rate of capital appreciation on stocks between 1926 and 1951, i.e., 5.47% per year according to Ibbotson Associates — would make an average error of 3.4% and a mean absolute error of 17.3%. For the thirteen-month forecasts, the errors of the naive strategy amount to, respectively, 1.7% and 12.7%. Again, these numbers compare favorably with the economists' thirteen-month average error of 4.1% and mean absolute error of 15.1%.

CONCLUSIONS

I have studied the stock market expectations of professional economists. Few readers would deny that the economists represent "smart money," which is much more sophisticated than the average investor. Contrary to what one may have thought, the economists are not excessively optimistic in bull markets or excessively pessimistic in bear markets. They do make systematic errors, however.

The economists very much lack predictive power for the direction and the magnitude of stock market changes. Indeed, their predictions amount to pure error. Nevertheless, the individual "experts" seldom provide forecasts that simply scale up the last-known level of the market index by a fixed percentage. This behavior is consistent with overreaction and with the findings of Kahneman and Tversky that intuitive prediction is insufficiently regressive.

If experts fall into the same traps as do naive subjects studied by psychologists in controlled experiments, it seems reasonable that finance should attempt to model the behavior of representative nonrational investors and the nature of their errors. This approach was once more widely accepted than it is today. For example, Keynes mentioned stock market overreaction in *The General Theory* in 1936. In 1928 Irving Fisher wrote a book entitled *The Money Illusion*.

But, of course, the pendulum swung with the rational expectations revolution in economics. Often, this represents an improvement over old ways. Still, as the anomaly list with respect to the rational models keeps growing, I would suggest that a return to the intellectual broadmindedness of yesterday — admitting to some irrationality and exploring its equilibrium implications — is a promising research strategy.[13]

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[1] Past work on the Livingston surveys usually examines predictions of the consumer price index (CPI). Lakonishok [1980], Pearce [1984], and Dokko and Edelstein [1989], however, test whether the S&P forecasts are consistent with rational expectations. They do not test for a specific alternative hypothesis. Only Dokko and Edelstein conclude, inexplicably, that the forecasts are informationally efficient.

[2] As opposed to inflation and industrial growth statistics, which become available with approximately one month of delay, the level of the S&P is available immediately. Therefore, the S&P forecasts are over seven- and thirteen-month horizons.

[3] It seems implausible, at best, that expected returns should ever rationally be negative. However, standard asset pricing theories, such as the Capital Asset Pricing Model, do not rule out this possibility. For example, it could happen if the economists believe that the fortunes of S&P companies are sufficiently negatively correlated with the unobservable market portfolio, i.e., if the S&P has a large enough negative beta.

[4] Note that the returns reported in Tables 1 and 2 and shown in Figure 1 do not coincide exactly because slightly different computational techniques are used. However, all the findings contradict the major assumption underlying Dokko and Edelstein [1989]: The economists definitely do not perceive stock prices to follow a geometric random walk.

[5] One may think that academic economists, familiar with the notion of efficient markets, would behave differently. Fortunately, the Livingston surveys categorize economists by affiliation. There is a separate code for "academic institutions" (about one-fifth of all forecasts). I tested to see whether, in bull and bear markets, the stock return, inflation, and industrial production forecasts of academic economists systematically differ from the predictions of other economists. They do not.

[6] The regression results in Table 4 are ordinary least squares estimates. But, because the sampling interval (six months) is shorter than the forecasting interval (seven or thirteen months), a correction for serial correlation in the error terms is necessary to obtain correct standard errors of the estimates. I employed Hansen's Generalized Method of Moments with a Newey–West correction. I also used White's procedure to correct for heteroscedasticity, but the economic interpretation of the results never changes.

[7] The research is too large to summarize here. Surveys appear in Cutler, Poterba and Summers [1989], De Bondt and Thaler [1989], and Froot [1990].

[8] But, as there is measurement error in the eight-month expected inflation variable, the true beta coefficient is even more negative than −3.01.

[9] There is some question as to whether Equations (2) and (4) are misspecified. For example, there may be omitted variables. This critique is not valid with respect to Equation (6). Under the null hypothesis of rationality, no variable on the right-hand side of that equation should ever help to explain forecast errors. One may still invoke peso problems or learning to uphold rationality.

[10] There are econometric complications similar to those described in footnote 6.

[11] Except for one case (eight-month expected economic growth in high P/E markets), all the relevant comparisons of means between extreme and "other" markets have t-statistics above 4.0.

[12] There are a few no-change predictions. For the purposes of Table 5, I classify these forecasts as "up."

[13] See Shleifer and Summers [1989] and Shefrin and Statman [1989] for similar points of view.