NBER WORKING PAPER SERIES

MEASURING BUBBLE EXPECTATIONS AND INVESTOR CONFIDENCE

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Working Paper 7008
http://www.nber.org/papers/w7008

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
March 1999

The author wishes first to thank the many individuals who have filled out questionnaires that are the basis of this study. The author is indebted to Yoshiro Tsutsui of Osaka University and Fumiko Kon-Ya of the Japan Securities Research Institute, who have collaborated with me on questionnaire design and who have been doing similar questionnaire surveys in parallel in Japan, and to Carol Copeland and Glena Ames for administering the US surveys. Thanks, too, go to Peter Bernstein, William Brainard, Karl Case, Stephen Morris, Michael Niemira, Jeremy Siegel, Richard Thaler, James Tobin and Allan Weiss for helpful discussions along the way. This US research was supported by US National Science Foundation under a series of grants extending back to 1989 and by the Cowles Foundation for Research in Economics at Yale University. The views expressed in this paper are those of the authors and do not reflect those of the National Bureau of Economic Research.

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NBER Working Paper No. 7008
March 1999
JEL No. G12

ABSTRACT

This paper presents evidence on attitude changes among investors in the US stock market. Two basic attitudes are explored: bubble expectations and investor confidence. Semiannual time-series indicators of these attitudes are presented for US stock market institutional investors based on questionnaire survey results 1989–1998, from surveys that I have derived in collaboration with Fumiko Kon-Ya and Yoshiro Tsutsui.

Five different time-series indicators whether there is among investors an expectation of a speculative bubble, an unstable situation with expectations for increase in the short run only, are produced. Four different time-series indicators whether there is an expectation of a negative speculative bubble are presented. Four different time-series indicators of investor confidence, that nothing can go wrong, are produced.

Time-series variation for these indicators is significant, and cross correlations are generally positive. A bubble expectations index, a negative-bubble expectations index, and an investor confidence index are derived from these indicators.

Behavior of the indicators and indexes through time is examined, and the indexes are compared with other economic variables. A notable finding is a degree of high-frequency fluctuation, semester to semester, in the indexes.

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Certain investor attitudes and opinions are commonly remarked by observers of speculative markets as having changed in important ways through time and the changes as having important consequences for the markets. One such attitude is "bubble expectations," that is, investor thinking that leads towards speculating on a perceived temporary uptrend before the "bubble" bursts. Another such attitude, and a very different attitude, is investor "confidence," an attitude that nothing can go wrong with the investment, that investors can sleep easy since there is nothing to worry about. While there are many other investor attitudes that might also be studied, it appears that these two may deserve particular consideration because of their alleged tendency to change importantly through time and their potential importance for the behavior of markets.

There appears to be little already-available quantitative evidence on these investor attitudes, and so those who think that there are important changes in these attitudes through time are forced to rely mostly on their own casual and informal observations. Most data on investor sentiment refer to simple expectations for price change or indicators of these expectations. These data are useful, but may not capture essential elements of investor thinking. Katona [1975] has argued that most people do not have precise expectations for future changes over specific horizons, and when asked for numerical values merely invent them to please the interviewer. It is best, in survey research, to study issues people think about and in terms that are natural to them. This paper is predicated on the assumption that the ideas that there may be a bubble, as commonly defined, or that one can be confident that prices will always increase, are important

mental constructs whose population frequency through time should be studied.

I, in collaboration with Yoshiro Tsutsui of Osaka University and Fumiko Kon-Ya of the Japan Securities Research Institute, created questionnaires about investor attitudes and we have been distributing these every six months since 1989 to institutional investors in both the US and Japan.[1] I have also distributed questionnaires to individual investors in the US in 1989 and 1996.[2] Details of the survey construction are given in Shiller, Kon-Ya and Tsutsui [1995]. Since the basic battery of questions has been virtually unchanged in all these surveys, they allow comparisons through time (as well as across countries).[3] In each US survey, I have mailed to a random sample of 400 people, and so in the 19 institutional investors surveys 7,600 first mailings have been made.[4] The average

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[1]Individual question responses are tabulated on my web site, http://www.econ.yale.edu/~shiller/investor.

[2]For institutional investors, a random sample geographically dispersed across the United States was obtained each year from the investment managers section of the *Money Market Directory of Pension Funds and Their Investment Managers*. For individual investors, I used a list entitled "High-Grade Multi-Investors" from W.S. Ponton, Inc, net worth generally over $250,000, with a random selection from the United States.

[3]Various extra questions have been appended to the end of the questionnaires, reflecting current situations, but the beginning of the questionnaire has been virtually the same for all surveys. See appendix.

[4]First mailing dates were July 5, 1989 (institutional and individual), January 17, 1990, July 27, 1990, January 31, 1991, August 20, 1991, January 31, 1992, August 20, 1992, February 12, 1993, August 6, 1993, February 28, 1994, September 8, 1994, March 4, 1995, September 1, 1995, March 1, 1996, July 30, 1996 (institutional) September 13, 1996 (individual), March 17, 1997, September 5, 1997, March 2, 1998, and September 9, 1998. To each person who did not respond, a second mailing was also made several weeks after the first, with a new letter and a replacement questionnaire.

institutional survey produced 128 responses, for a response rate of 32 percent. Failure to respond may reflect many things, sometimes inadequate addresses, retirements, job changes, but apparently more often the respondents' lack of time to attend to the questionnaire or a feeling of lack of appropriate knowledge or interest.

Our questionnaires concentrate on the stock market outlook, and therefore our results have the advantage, relative to surveys that cover many issues as well as the stock market, that we have focused the respondents thought and attention on this issue, and we should therefore have more meaningful answers. By asking a number of questions that relate to our basic concepts of bubble expectations or confidence, we improve both validity and reliability of our indexes. Validity, that our indices measure what we want them to measure, is improved by asking a number of questions since any given question may have associations or interpretations that deviate somewhat from our basic concepts and that also vary through time. Reliability, that our indices have small standard errors, is enhanced also by averaging over a number of questions for each respondent, therefore reducing the impact of erratic answers.

Method and Construction of the Bubble Expectation Indicators and Bubble Expectations Index

The questions on which the bubble expectation indicators and the bubble indexes are created are the following:

1. Stock prices in the United States, when compared with measures of true fundamental value or sensible investment value, are:

[CIRCLE ONE NUMBER]

1. Too low. 2. Too high. 3. About right. 4. Do not know.

4. How much of a change in percentage terms do you expect in the following (a "+" before your number to indicate an expected increase, a "–" to indicate an expected decrease, leave blanks where you do not know):

[FILL IN ONE NUMBER FOR EACH]

	In 1 month	In 3 months	In 6 months	In 1 year	In 10 years	
Dow Jones Industrial	____%	____%	____%	____%	____%	average
Nikkei Dow (Japan)	____%	____%	____%	____%	____%	

5. "Although I expect a substantial drop in stock prices in the US ultimately, I advise being relatively heavily invested in stocks for the time being because I think that prices are likely to rise for a while."

[CIRCLE ONE NUMBER; IF YOU CIRCLE 1. ALSO INDICATE DATE]

1. True. Your best guess for the date of peak: _____/____/____
   month/ day / year
2. False.
3. No opinion.

6. "Although I expect a substantial rise in stock prices in the US ultimately, I advise being less invested in stocks for the time being because I think that prices are likely to drop for a while."

[CIRCLE ONE NUMBER; IF YOU CIRCLE 1. ALSO INDICATE DATE]

1. True. Your best guess for the date of bottom: _____/____/____
   month/ day / year
2. False.
3. No opinion.

11. "Many people are showing a great deal of excitement and optimism about the prospects for the stock market in the United States, and I must be careful not to be influenced by them."

    1. True. 2. False. 3. No opinion.

12. (question introduced 1994-II) "Many people are showing a great deal of pessimism about the prospects for the stock market in the United States, and I must be careful not to be influenced by them."

    1. True. 2. False. 3. No opinion.

13. What do you think is the probability of a catastrophic stock market crash in the US, like that of October 28, 1929 or October 19, 1987, in the next six months, including the case that a crash occurred in the other countries and spreads to the US? (An answer of 0% means that it cannot happen, an answer of 100% means it is sure to happen.)[5]

    Probability in US:_____%

The following five indicators were defined, each to represent evidence of a bubble, and each to have a relatively simple and uncomplicated interpretation:

TOOHIGH&UP (B1) is the percentage choosing 2 in question 1 (too high) and expecting an increase in stock prices in the shortest horizon in question 4 for which they gave an answer. Percentage is of those who answered question 1 (including answering no opinion) and gave at least one US expectation in 4.

UPDOWN (B3) is the percentage who predict an increase for the US in the shortest horizon (up to six months) for which they gave an expectation for the US in question 4 and then a decrease over any longer horizon (up to one year). Percentage is of those giving an answer for the US in question 4 for the one, three or six-month horizon and who gave an answer for at least two horizons up to one year.

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[5]The wording of this question was slightly different in the first questionnaire: "What do you think is the probability of a catastrophic stock market crash, like that of October 28, 1929 or October 19, 1987, in the next six months? (An answer of 0% means that it cannot happen, an answer of 100% means it is sure to happen.)"

RISEFORWHILE (B5) is the percentage selecting one to question 5 (think stocks will rise for a while and advise staying in only for short run). Percentage is of those answering question 5 (including answering no opinion).

SEEOPTIMISM (B7) is the percentage selecting 1 to question 11 (who see optimism and feel they must be careful not to be influenced by it). Percentage is of those answering question 11.

UP&CRASH (B9) is the percentage who expect an increase in stock prices in question 4 over the shortest time horizon for which they gave an expectation and who also think the probability of a stock market crash, question 13, is greater than 10%. Percentage is of those answering questions 13 and giving expectations in 4 for the US for at least one horizon.

The bubble expectations index is derived by taking the average of the five indicators variables and multiplying this average by 100 to convert to percent. Since all indicators are proportions of respondents (in percent) that have, by some interpretation, bubble expectations, the index may be thought of loosely as an estimate of the percent of the population with bubble expectations.

A negative bubble index is created using the following indicators:

TOOLOW&DOWN (B2) is the percentage choosing 1 in question 1 (too low) and expecting a decrease in stock prices in the shortest horizon in question 4 for which they gave an answer. Percentage is of those who answered question 1 (including answering no opinion) and gave at least one US expectation in 4.

DOWNUP (B4) is the percentage who predict a decrease for the US in the shortest horizon (up to six months) for which they gave an answer and then an increase over any longer horizon (up to one year). Percentage is of those giving an answer for the US in question 4 for the one, three or six-month horizon and who gave an answer for at least two horizons up to one year.

FALLFORWHILE (B6) is the percentage selecting one to question 6 (think stocks will fall for a while and advise staying out only for short run).

Percentage is of those answering question 6 (including answering no opinion).

SEEPESSIMISM (B8) is the percentage selecting 1 to question 12 (who see pessimism and think they must be careful not to be influenced by it). Percentage is of those answering question 12 (including answering no opinion)

As with the bubble index, the negative bubble index is just an average of the four indicators, and it also has the interpretation as the average percent of the population with negative bubble expectations.

Method and Construction of The Index of Investor Confidence

The index of investor confidence is based on questions 4 and 13 shown above and on two more questions:

14. "If the Dow dropped 3% tomorrow, I would guess that the day after tomorrow the Dow would:"
    1. Increase. Give percent:_____
    2. Decrease. Give percent:_____
    3. Stay the same.
    4. No opinion.

15. (question introduced 1994-II) "If the Dow dropped 25% over the next six months, I would guess that the succeeding six months the Dow would:"
    1. Increase. Give percent:_____
    2. Decrease. Give percent:_____
    3. Stay the same.
    4. No opinion.

The following four confidence indicators were constructed:

ONEDAYUP (C1) is the percentage of respondents choosing 1 (increase)

in question 14. Percentage is of all answering question, including no opinion.

SIXMONTHUP (C2) C2 is the Percentage of respondents choosing 1 (increase) in question 15. Percentage is of all answering question, including no opinion.

CRASHSAFE (C3) C3 is 100 minus the average probability (in percent) of a stock market crash from question 13.

ONLYUP (C4) C4 is the percentage of respondents indicating expectations for price increases at the one, three month, six month and twelve month horizons in question 4. Percentage is of all who gave expectations for all four horizons. (In earlier questionnaires, the one-month horizon was omitted.)

The first two of these four indicators were chosen on the observation that the form that investor confidence often seems to take is a feeling that, while stock market corrections are sure to come from time to time, they are always soon reversed. The investor confidence index was computed as the average of the four indicators, except that, since before 1994-II the question on which C2 is based was not yet asked, for those dates it was replaced its mean 1994-II to 1998-II.

The Results

The components of the bubble expectations index are shown along with the index in Table 1, the components of the negative bubble expectations index are shown along with the index in Table 2, and the components of the investor confidence index are shown along with the index in Table 3. The data shown in the tables are plotted in figures 1 through 3. Standard errors for the components and the indexes are shown in Tables 4 through 6.

The indices show a lot of short-term oscillations. The first thought one may have is that these oscillations might be measurement error, but the standard errors are sufficiently small that we may rely on much of the fluctuations as valid.

As further evidence that these oscillations are not primarily measurement error, we note that there is substantial comovement across these indicators and substantial linkages with historical events. The average correlation coefficient for the ten-pairs of bubble index indicators is 0.30, for the six pairs of negative bubble index indicators is 0.47, and for the six pairs of confidence index indicators is 0.13. Note that all five of the bubble-index indicators in 1990–1, when the 1990 recession was becoming apparent, were below their means then.[6] One year later, in 1991–1, with the recession over, all five of the indicators had increased substantially. Note also that the oscillations in the negative bubble expectations index tend to move opposite those in the bubble expectations index, and that the trends in the two indexes are in opposite directions.

The indicators show an apparent relation to the lagged change in stock prices. Figure 4 shows the bubble expectations index along with the percentage change of the Dow Jones Industrial Average over a six-month period ending ten days after the first mailing of the questionnaire (thus around the time that respondents filled out the questionnaire). In this figure five of the six peaks in the bubble expectations index correspond to peaks in the percentage change in the Dow Jones Industrial Average. The correlation between the two series is 0.39 and the t statistic is 1.76.

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[6]According to the NBER reference cycle dating, the recession of 1990–1991 began at a peak in July 1990 (just before the 1990-II responses) and ended with a trough at March 1991 (at around the time of the 1991-I responses).

Comparison with Existing Sentiment Indicators Related to the Stock Market

There are two basic kinds of market sentiment indexes: those that are derived from prices or quantities in markets under a theory relating them to sentiments, and those that are based on polling of investors.

Figure 5 shows a few examples of the first kind of sentiment indices for dates corresponding to survey dates. The put/call ratio is the ratio of puts to calls outstanding. A high ratio is supposed by some to indicate negative market sentiment, but whether it does so is very much open to question. While it is true that people who think the market will go down might be inclined to buy puts, the prices of puts and calls, and the price of the market itself, are not constant when the number of people thinking the market will go down changes. The short interest ratio, the number of trading days at average volume required to cover total short interest, is interpreted by some in the same way as the put/call ratio, but it has much the same potential shortcomings. Another indicator, the ratio of the high grade bond price to intermediate grade bond price, one version is called the Barron's Confidence Index, is supposed to indicate general faith in corporations, by showing concern with default on their debt. But there is no reason to think it is tightly tied to people's expectations for the stock market price.

De Long and Shleifer [1991] and Lee Shleifer and Thaler [1991] have claimed to infer an indicator of market sentiment from data on discounts on closed end mutual funds. They see an advantage in inferring sentiment in this way since the sentiment can be inferred from market data, does not require a questionnaire survey with the risk of sample selection biases, and allows construction of a time series very far back. A disadvantage of their indicator, stressed by Chan, Kan and Miller [1993], is that it is not entirely

clear that closed-end mutual fund discounts really do measure market sentiment. They might reflect only confidence in closed-end mutual funds.

As can be seen from Figure 5, these varying indicators do not closely resemble each other. Nor do they closely resemble the bubble expectations index. The indicator that most closely resembles the bubble expectations index appears to be the New York Stock Exchange put-call ratio, which tends to show short-run movements opposite those of the bubble expectations index. But, even here the resemblance is not close. Note also that none of these indicators shows a pronounced uptrend through time, and so none resembles the dramatic uptrend in the market over this time interval.

Figure 6 shows, for dates corresponding to survey dates, some examples of market sentiment indexes obtained by polling people's expectations. The American Association of Individual Investors has a weekly poll of its members, reporting percent bullish. The University of Michigan Consumer Sentiment Index is an index of overall confidence. Investors' Intelligence of New Rochelle New York has been computing for 35 years a tally of investors' advisory newsletters, categorizing the newsletters into bullish, bearish or neutral categories. Investors Intelligence also tallies the percent of newsletters predicting a "correction," which is shown in Figure 6. While the meaning of the term "correction" is not unambiguous, it is possibly the closest available indicator to the bubble expectations described here, and it is the indicator that shows the closest resemblance to the bubble expectations index.

There are still other investor sentiment indices, not shown in the figure. Mark Hulbert, A Forbes columnist, edits a newsletter *Hulbert Financial Digest* that reports the recommended fraction of stocks vs t-bills in

portfolios of 101 investment newsletters (Graham and Harvey [1996], studying these data, find no evidence that these data have an ability to predict the actual future course of the market). Marketvane of Pasadena California has a weekly index, a percent bullish on stock index futures prices in commodity trading newsletters, hotlines and emails. Their bullish consensus time series goes back to 1981 (http://home.earthlink.net/~marketvane/index.html/bullish.htm). A similar index is available from Consensus Inc., Kansas City MO.

None of these indicators is really trying to capture the notion of a bubble: they are merely indicators of expectations for the market. The bubble index here appears to be the first of its kind.

There is one index of investor confidence, in the United Kingdom. It is created by Gallup for Pearl Unit Trusts. The index is based on answers to two questions, asking whether the UK stock market is "likely" or "very likely" to go up in six months or one year. Their concept of confidence appears to be a little different than that used here, which stresses more the absence of risk of major or sustained loss. I think that my definition is a little closer to what we mean by "confidence," the absence of major risks.

Conclusion

Evidence has been presented here that bubble expectations and investor confidence as defined here do vary through time. There are significant semester-to-semester variations in the indicators derived here from investor responses.

The variations through time in the indicators are often significant but

not enormous. Although certain of the indicators show striking movements, as for example an increase in the percentage of institutional investors who think that the stock market will fall for a while (FALLFORWHILE) from 24% to 70% between 1989-II and 1990-I, this dramatic change in sentiment is not so strongly confirmed by other indicators. The percentage of institutional respondents showing bubble expectations as defined here has remained in a relatively narrow range, with the bubble expectations index for institutional investors ranging from 14% to 31% over the entire sample.

Evidence that there is a dominant trend or other low-frequency component to the indexes for institutional investors is weak. The bubble expectations index and the investor confidence index were both very low in the recession of 1990, which creates a suggestion of a trend on the plots. However, if we exclude this recession from our sample, then investor confidence has remained very flat. The appearance of an uptrend in the bubble expectations index since the recession is due primarily to only one indicator, that investors see excessive optimism on the part of other investors (SEEOPTIMISM). Overall, while price–earnings ratios and price dividend ratios are at record high levels at the end of the sample here, the institutional investor indicators here are little different from earlier times. Moreover, the negative bubble expectations index often exceeds the bubble expectations index, even near the end of the sample.

The observations for individual investors (Table 1) show a much greater increase in bubble expectations between 1989-II and 1996-II than was found for institutional investors over any time interval starting in 1989-II. Moreover, the spread between the bubble expectations index and the

available negative bubble index indicators was much higher in 1996-II for individual investors than it was for institutional investors. But, these observations on two points of time do not inform us much about the trend or other time pattern of individual investor opinions.

For institutional investors, instead of substantial trend or predominantly low-frequency variation, we find we find that indicators and indexes more nearly resemble white noise from semester to semester. The serial correlation coefficient for the bubble expectations index is only 0.11, for the negative bubble expectations index is only 0.08, and for the investor confidence index is only 0.13.

As shown in Figure 4, the bubble expectations index shows substantially similar high frequency movements as does the return on the stock market over the previous six months, a return which, by the random walk theory, approximates white noise. These data suggest that levels of bubble expectations for institutional investors may be substantially driven by lagged price changes over this time interval, price increases tending at all times to produce some increase in the fraction of the population with bubble expectations.

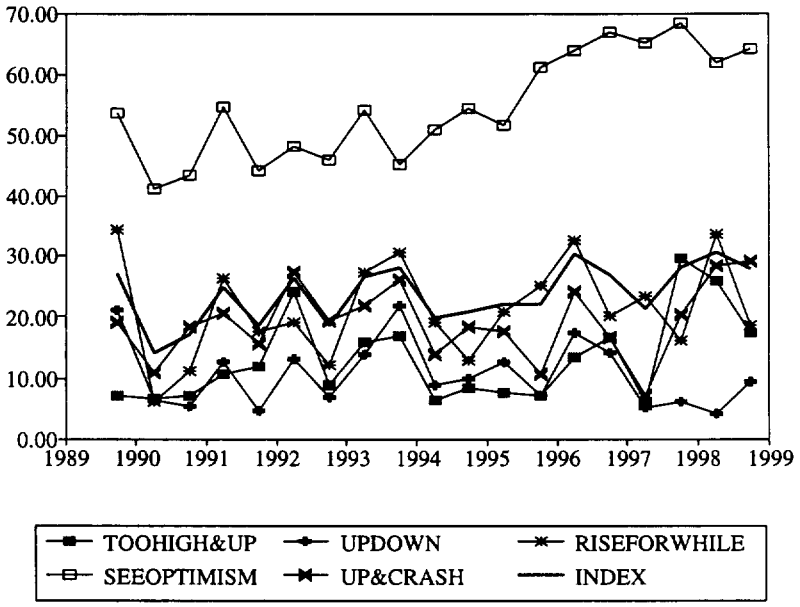

Figure 1. Indicators of Bubble Expectations and the Bubble Expectations Index. Each indicator represents percentage of population showing a form of bubble expectations as described in text. The index is the average of the indicators.

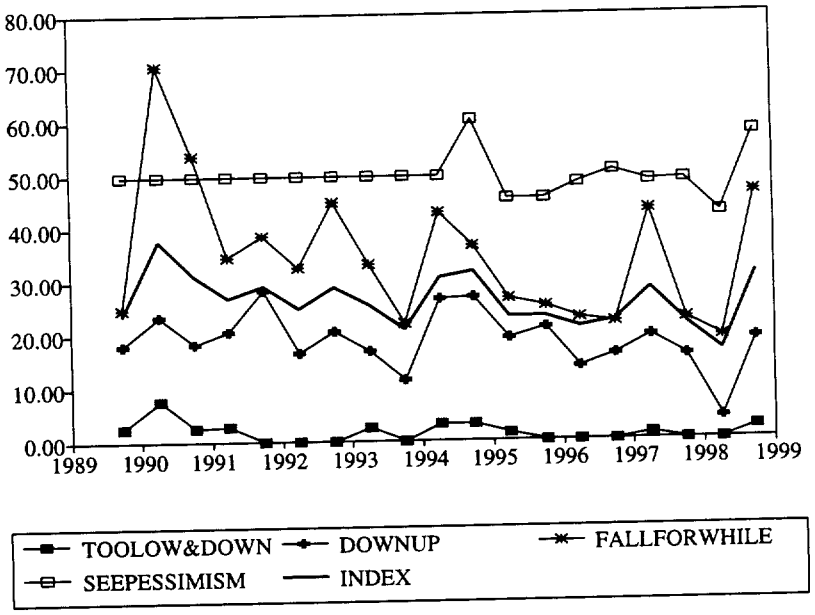

Figure 2. Indicators of Negative Bubble Expectations and Negative Bubble Expectations Index. Each indicator represents percentage showing a form of negative bubble expectations as described in text. The index is the average of the indicators.

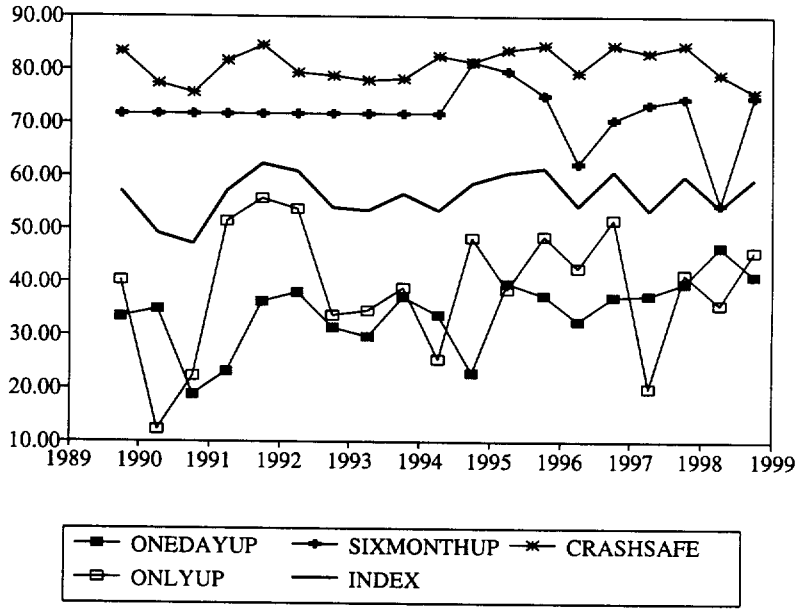

Figure 3. Indicators of Investor Confidence and Investor Confidence Index. Indicators are described in text. The index is average of indicators shown.

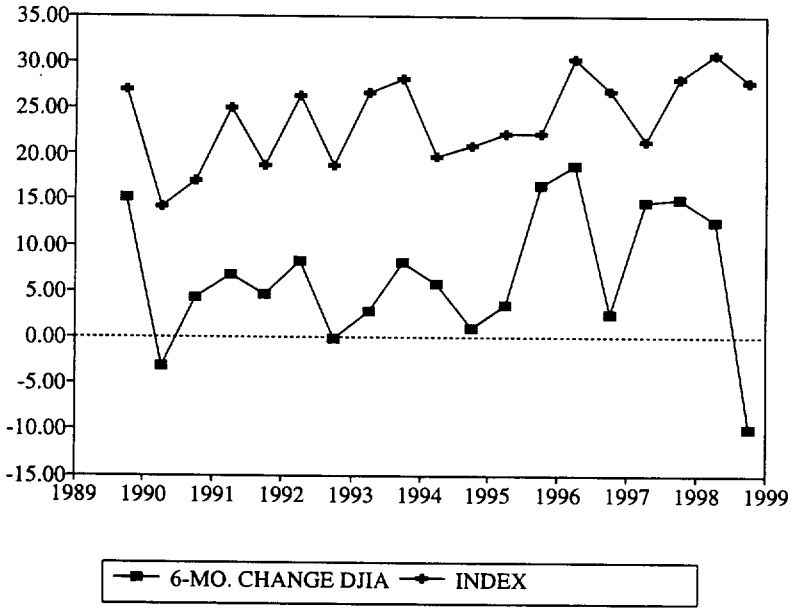

Figure 4. Percentage change in Dow Jones Industrial Average over Six Months up to date of survey and the Bubble Expectations Index.

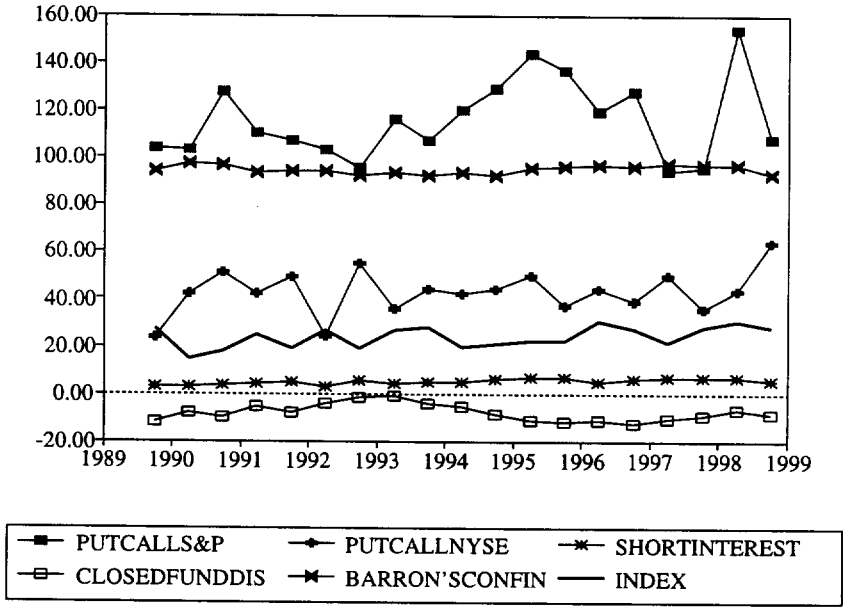

Figure 5. Indicators Related to Investor Sentiment (on Survey Dates) and Bubble Expectations Index.

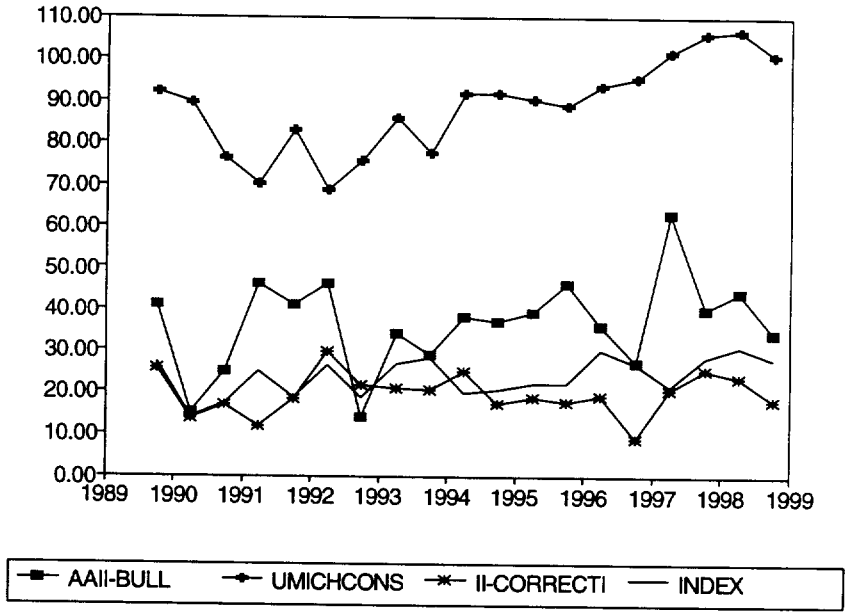

Figure 6 Market Sentiment Indicators (on Survey Dates) and Bubble Expectations Index.

Table 1. Indicators of Bubble Expectations and Bubble Expectations Index, in Percent of Respondents (as plotted in Figure 1)

	TOOHIGH & UP	UPDOWN	RISEFOR WHILE	SEE OPTIMISM	UP& CRASH	INDEX
1989-II	6.97674	21.1382	34.4371	53.66424	19.084	27.0557
1990-I	6.72269	6.25	5.97015	41.1765	10.9244	14.2087
1990-II	7.2	5.51181	11.1111	43.4783	18.254	17.111
1991-I	10.5263	12.6214	26.3566	54.8148	20.6897	25.0017
1991-II	11.8881	4.58015	16,6471	44.0789	15.6028	18.7594
1992-I	24.2038	13.0137	19.186	48.2558	27.451	26.4221
1992-II	8.84956	6.79612	12.2951	45.9016	19.469	18.6623
1993-I	15.748	13.913	27.4809	54.1353	22.0472	26.6649
1993-II	16.9643	21.875	30.7087	45.2381	26.087	28.1746
1994-I	6.48148	8.79121	19.1667	50.8197	13.8889	19.8296
1994-II	8.33333	10	12.7907	54.5455	18.3099	20.7959
1995-I	7.59494	12.6984	20.9302	51.7241	17.7215	22.1338
1995-II	6.97674	7.04225	25.2632	61.2245	10.4651	22.1944
1996-I	13.4328	17.3077	32.5301	63.8554	24.2424	30.2737
1996-II	16.6667	14.0351	20.2128	67.0213	16.6667	26.9205
1997-I	6.18557	5.10204	23.3333	65.2893	7.14286	21.4106
1997-II	29.6875	6.15385	16.2162	68.4211	20.3125	28.1582
1998-I	25.8621	4.16683	33.6066	62.0155	28.4483	30.8198
1998-II	17.5258	9.41176	18.6275	64.2202	29.1667	27.7904
Mean	13.0435	10.5478	21.4668	54.7294	19.2618	23.8099
Stddev	7.02208	5.25565	7.84972	8.51689	5.97792	4.62541
Individual Investors:						
1989-I	12.9032	23.3333	43.5897	50.4274	27.3684	31.5244
1996-II	34.8624	25.4902	56.9231	65.1852	32.0755	42.9073

Table 2. Indicators of Negative Bubble Expectations and Negative Bubble Expectations Index, In Percent of Respondents (as plotted in Figure 2)

	TOOLOW& DOWN	DOWNUP	FALLFOR WHILE	SEE PESSIMISM	INDEX
1989-II	2.32558	17.8862	24.6575	49.658	23.6318
1990-I	7.56303	23.2143	70.3704	49.658	37.7014
1990-II	2.4	18.1102	53.6765	49.658	30.9612
1991-I	2.63158	20.3883	34.4262	49.658	26.776
1991-II	0	28.2443	38.4106	49.658	29.0782
1992-I	0	16.4384	32.3353	49.658	24.6079
1992-II	0	20.3883	44.9153	49.658	28.7404
1993-I	2.3622	16.5217	32.8125	49.658	25.3386
1993-II	0	11.4583	21.9512	49.658	20.7669
1994-I	2.77778	26.3736	42.735	49.658	30.3861
1994-II	2.77778	26.6667	36.4706	60.2273	31.5356
1995-I	1.26582	19.0476	26.4368	45.3488	23.0248
1995-II	0	21.1268	25	45.3608	22.8719
1996-I	0	13.4615	22.7848	48.1481	21.0986
1996-II	0	15.7895	21.978	50.5263	22.0735
1997-I	1.03093	19.3878	43.1034	48.3333	27.9639
1997-II	0	15.3846	22.5352	48.6842	21.651
1998-I	0	3.85931	19.0083	42.6357	16.3758
1998-II	2.06186	18.8235	46.1538	57.6577	31.1742
Mean	1.4314	18.5564	34.7243	49.658	26.0925
Stddev	1.83951	5.50643	12.8823	3.75422	4.9442
Individual Investors:					
1989-II	0	7.77778	24.3478		
1996-II	0	4.90196	22.4		

Table 3. Indicators of Investor Confidence Index and Investor Confidence Index In Percent (as plotted in Figure 3)

	ONEDAY UP	SIXMONTH UP	CRASH SAFE	ONLYUP	INDEX
1989-II	33.3333	71.736	83.2399	40.1709	57.12
1990-I	34.7826	71.736	77.3213	12.2449	49.0212
1990-II	18.5714	71.736	75.6838	21.978	46.9923
1991-I	22.9008	71.736	81.6693	51.25	56.889
1991-II	36.1842	71.736	84.6137	55.6701	62.051
1992-I	37.8698	71.736	79.1929	53.5714	60.5925
1992-II	31.405	71.736	78.8352	33.7349	53.9278
1993-I	29.4574	71.736	77.9601	34.4444	53.3995
1993-II	37.0079	71.736	78.1805	38.8235	56.437
1994-I	33.6134	71.736	82.6036	25.3012	53.3136
1994-II	22.619	81.3953	81.3672	48.1481	58.3824
1995-I	39.5349	79.5455	83.5758	38.4615	60.2794
1995-II	37.234	75.2688	84.5974	48.4848	61.3963
1996-I	32.5301	62.1951	79.1896	42.5532	54.117
1996-II	36.9565	70.5263	84.52	51.6129	60.9039
1997-I	37.3913	73.2759	83.0711	20	53.4346
1997-II	39.726	74.3243	84.4533	41.4634	59.9918
1998-I	46.4567	54.3307	79.1543	35.443	53.8462
1998-II	40.9524	74.7664	75.7151	45.4545	59.2221
Mean	34.133	71.7365	80.7865	38.8848	56.3851
Stddev	6.67904	5.52726	97.0079	11.8103	4.12617
Individual Investors:					
1989-II	35.3448		81.8498	51.2195	
1996-II	46.2121		82.031	47.3684	

Table 4. Standard Errors Bubble Expectations Indicators and Index (in percentage points to be added or subtracted from values in Table 1)

	TOOHIGH UP	UPDOWN	RISEFOR WHILE	SEE OPTIMISM	UP& CRASH	INDEX
1989-II	2.24299	3.68142	3.86682	4.05813	3.32406	1.75852
1990-I	2.29555	2.28727	2.04679	4.22018	2.85959	1.44972
1990-II	2.31199	2.24845	2.7048	4.21992	3.44133	1.55351
1991-I	2.87431	3.27218	3.87897	4.28332	3.87187	1.877
1991-II	2.70649	1.82652	3.08198	4.027	3.35962	1.56556
1992-I	3.41834	2.78451	3.00242	3.81014	3.81108	1.78827
1992-II	2.67178	2.47987	2.97302	4.51155	4.31455	1.77524
1993-I	3.23222	3.22724	3.90037	4.3207	3.76913	1.91626
1993-II	3.54643	4.21923	4.09325	4.43411	4.38622	2.16522
1994-I	2.36905	2.9684	3.59317	4.52618	3.41836	1.72992
1994-II	3.25723	3.87298	3.60147	5.30795	4.95854	2.1924
1995-I	2.98055	4.19484	4.38675	5.35737	4.62359	2.21364
1995-II	2.74709	3.03647	4.4581	4.92185	3.86265	1.94718
1996-I	4.16604	5.24627	5.14232	5.27329	5.57327	2.65434
1996-II	4.21975	4.60077	4.14205	4.84908	4.39205	2.34942
1997-I	2.4459	2.67402	3.86101	4.32773	2.60154	1.63458
1997-II	5.71101	3.83667	4.28488	5.33196	5.02906	2.608
1998-I	4.06558	4.16683	4.27656	4.27325	4.18899	2.21623
1998-II	3.86022	3.1671	3.85492	4.59136	4.63902	2.11866

Table 5. Standard Errors Negative Bubble Expectations Indicators and Index (in percentage points to be added or subtracted from values in Table 2)

	TOOLOW DOWN	DOWNUP	FALLFOR WHILE	SEE PESSIMISM	INDEX
1989-II	1.32697	3.45553	3.56712	0	1.71354
1990-I	2.4238	3.98941	3.92999	0	2.03402
1990-II	1.36891	3.75861	4.27586	0	1.95175
1991-I	1.49922	3.96973	4.3016	0	2.01412
1991-II	0	3.93331	3.95813	0	1.86004
1992-I	0	3.0673	3.61961	0	1.58149
1992-II	0	3.96973	4.57901	0	2.02007
1993-I	1.34762	3.4631	4.1501	0	1.85689
1993-II	0	3.25087	3.73216	0	1.64982
1994-I	1.58132	4.61935	4.57345	0	2.22998
1994-II	1.93671	5.70899	5.22095	5.21733	3.37756
1995-I	1.25779	4.94726	4.72797	5.36826	3.12329
1995-II	0	4.84454	4.41942	5.05483	2.94945
1996-I	0	4.73315	4.71911	5.55174	3.09027
1996-II	0	4.8298	4.34092	5.12961	2.95031
1997-I	1.0256	4.70809	4.59801	4.56182	2.86189
1997-II	0	5.65685	4.95854	5.73341	3.37245
1998-I	0	3.85931	3.56697	4.35424	2.43269
1998-II	1.44284	4.23991	4.88838	4.6898	2.86471

Table 6. Standard Errors, Investor Confidence Indicators and Index (in percentage points to be added or subtracted from values in Table 3)

	ONEDAY UP	SIXMONTH UP	CRASH SAFE	ONLYUP	INDEX
1989-II	3.849	0	1.2353	4.51306	1.57092
1990-I	4.05437	0	1.98463	3.31132	1.47085
1990-II	3.2866	0	2.03603	4.34092	1.545
1991-I	3.67125	0	1.75551	5.58842	1.81446
1991-II	3.89764	0	1.43576	5.04398	1.70113
1992-I	3.73125	0	1.73001	4.71249	1.64284
1992-II	4.21942	0	1.85034	5.18971	1.81904
1993-I	4.01354	0	1.89004	5.00891	1.75863
1993-II	4.28438	0	1.9397	5.28604	1.85686
1994-I	4.33035	0	1.75799	4.77187	1.74626
1994-II	4.56472	4.19625	1.75638	6.79947	1.74626
1995-I	5.27222	4.29993	1.67392	6.7466	2.60657
1995-II	4.98618	4.47392	1.76087	6.15175	2.4945
1996-I	5.14232	5.35482	2.18483	7.21191	2.85097
1996-II	5.03236	4.67769	1.82002	8.97559	3.04157
1997-I	4.51184	4.10869	1.64878	4.78091	2.14582
1997-II	5.72718	5.07821	1.7229	7.69404	2.93933
1998-I	4.42563	4.42011	1.62468	5.38175	2.26932
1998-II	4.79895	4.19905	2.20967	5.67443	2.39171

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Appendix:
Changes in Order of Questions and Changes in Wordings of Questions

A. Changes in Order of Questions

Questions one through six were all asked unchanged and in the same order at the beginning of the questionnaire, The only change in this part of the questionnaire was the addition, in the 1994-II survey, of a new question 2, starting in 1994-II, "What do you think would be a sensible level for the Dow Jones Industrial Average based on your assessment of US corporate strength (fundamentals)?"

Other questions had their order changed somewhat, as indicated by the following table of numbers of the questions (numbering shown in bold at top is for latest questionnaires):

Institutional:

	1	**4**	**5**	**6**	**11**	**12**	**13**	**14**	**15**
1989-II	1	3	4	5	10	–	11	8	–
1990-I	1	3	4	5	10	–	11	8	–
1990-II		3	4	5	10	–	11	8	–
1991-I	1	3	4	5	10	–	11	8	–
1991-II	1	3	4	5	10	–	11	8	–
1992-I	1	3	4	5	10	–	11	8	–
1992-II	1	3	4	5	10	–	11	8	–
1993-I	1	3	4	5	10	–	11	8	–
1993-II	1	3	4	5	10	–	11a	8	–
1994-I	1	3	4	5	10	–	11a	8	–
1994-II	1	3	4	6	12	13	14	18	20
1995-I	1	3	4	6	12	13	14	18	20
1995-II	1	3	4	6	12	13	14	18	20
1996-I	1	3	4	6	12	13	14	18	20
1996-II	1	3	4	6	12	13	14	18	20
1997-I	1	3	4	6	12	13	14	18	20
1997-II	1	3	4	6	12	13	14	18	20
1998-I	1	3	4	6	12	13	13	14	15
1998-II	1	3	4	6	12	13	13	14	15
Individual Investors, question numbering:									
1989-II	1	3	4	5	10	–	11	8	–
1996-II	1	3	4	5	10	–	11	8	–

B. Changes in Wording of Questions

Question 4 was expanded in 1990-I to add the ten-year horizon, and in 1993-II questionnaire to add one more investor horizon, 1 month. Question 13, about the probability of a crash, had its wording changed:

Initial wording of question:

11. What do you think is the probability of a catastrophic stock market crash, like that of October 28, 1929 or October 19, 1987, in the next six months? (An answer of 0% means that it cannot happen, an answer of 100% means it is sure to happen.)

Probability:_____%

Starting with questionnaire 1993-II:

11a. What do you think is the probability of a catastrophic stock market crash in the US, like that of October 28, 1929 or October 19, 1987, in the next six months? (An answer of 0% means that it cannot happen, an answer of 100% means it is sure to happen.)

Probability:_____%

(11b was added to ask the same about the Japanese stock market)

Starting with questionnaire 1994-II:

14. What do you think is the probability of a catastrophic stock market crash in the US, like that of October 28, 1929 or October 19, 1987, in the next six months, including the case that a crash occurred in the other countries and spreads to the US? (An answer of 0% means that it cannot happen, an answer of 100% means it is sure to happen.)

Probability in US:_____%