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INVESTOR SENTIMENT MEASURES

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ABSTRACT

This paper compares investor sentiment measures based on consumer confidence surveys with measures extracted from the closed-end fund discount (CEFD). Our evidence suggests that these two kinds of sentiment measures do not correlate well with one another. For a short 2 −4 year period in which we have direct investor sentiment survey data from UBS/Gallup, only the consumer confidence correlates well with investor sentiment. Further, only the consumer confidence based measure can robustly explain the small-firm return spread and the return spread between stocks held disproportionately by retail investors and those held by institutional investors. Surprisingly, there is even a hint that the consumer confidence measure can explain closed-end fund IPO activity, while the CEFD cannot. In sum, our evidence supports the view that sentiment plays a role in financial markets, but that the CEFD may be the wrong measure of sentiment.

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A Introduction

The behavioral finance theory of DeLong, Shleifer, Summers, and Waldmann (1990) predicts that noise trader sentiment can persist in financial markets. Of course, *changes* in noise trader sentiment must be difficult to predict, or they could be arbitraged away. Assets that are disproportionally exposed to noise trader risk are both riskier and have to offer an extra return premium. In sum, the theory predicts that sentiment can influence security pricing under two necessary conditions: [1] the assets are held predominantly by sentiment (noise) traders, and [2] transaction costs are high enough to prevent systematic arbitrage by arbitrageurs.

Lee, Shleifer, and Thaler (1991), henceforth LST, explore the empirical implications of this theory by assuming that noise traders are identifiable with individual investors. Because individual investors were already known to disproportionally hold closed-end funds (henceforth, CEF), LST interpret the closed-end fund discount (henceforth, CEFD) as a (negative) sentiment factor. Lee, Shleifer, and Thaler (1991) then wring further implications and empirical support from this insight:[1]

1. *Decreases* in the CEFD (i.e., more optimism) should be positively correlated with the returns of assets that are disproportionally held by noise traders. LST identify small firms as such. They document that small firms outperform large firms when the CEFD decreases.

2. New CEF's tend to appear in LST's CEF data base when investor sentiment *levels* are very positive.

3. The CEFD on different funds should be positively correlated.

Lee, Shleifer, and Thaler (1991) also discount other possible factors determining the CEFD, first and foremost agency (transaction) costs. However, they do concede that multiple factors are likely to influence the CEFD. Ross (2002) explores these factors in more detail and argues that transaction costs are more important than LST realized. In any case, the behavioral finance and the transaction cost views of the closed-end fund discount are *not* mutually exclusive.

In a well-known (and amusing) exchange in the Journal of Finance in 1993, Chen, Kan, and Miller (1993) point out that the correlation between the CEFD and the size spread declined in the latter half of LST's sample. They also find that small firms with low institutional ownership have similar coefficients as large firms with high institutional ownership. Finally, "Che'KM" point out that the explanatory power of the CEFD for small-firm returns

[1] Lee, Shleifer, and Thaler (1991) can also hint that the theory is not inconsistent with a negative CEFD upon fund inception, followed by a sharp drop from a premium into a discount, and then a positive drift in CEFD reduction [to account for the need to offer a positive expected rate of return]. However, the dynamics are weak: the process by which the negative discount becomes positive is not clear, and we are not aware of evidence that the CEFD systematically narrows over time.

is generally low. In their rejoinder, Chopra, Lee, Shleifer, and Thaler (1993) respond that all small firms are generally noise-trader sensitive with low institutional ownership, that expecting to find an effect after splitting subsamples again is asking for too much, thus imposing an incorrect null hypothesis. Finally, CLST point out that the explanatory power of *anything* explaining rates of returns is very low.

Interest in the CEFD as a sentiment index has not waned. Indeed, Lee, Shleifer, and Thaler (1991) is a seminal paper, both in the novelty of its ideas and its subsequent impact: as of March 2004, a quick citation search yields over 100 cites to it. A search in SSRN shows that "investor sentiment" finds 53 matches, compared to 78 for the phrase "APT." If anything, investor sentiment has become a subject of more intense interest.

Our own paper revisits the sentiment evidence. We focus only on time-series sentiment evidence, and do so primarily by borrowing ideas and concepts of how to test for investor sentiment from LST. (We have little to say about the cross-sectional covariation in CEFD explored in Lee, Shleifer, and Thaler (1991).) We have two aces up our sleeves. First, our paper has an unfair advantage over LST—hindsight. That is, we can expand our sample from 1985 to 2002 (16 years), almost doubling the sample, which provides a true out-of-sample test. Second, we believe it is difficult to further validate the CEFD sentiment interpretation using other financial measures: it is always relatively more likely that some financial phenomenon steals significance from the CEFD because it, too, at least partly reflects investor sentiment. We thus suggest that a better approach is to explore different, "direct," non-financial-extracted measure of individual sentiment if we want to validate the interpretation of the CEFD as an investor sentiment measure.

Our paper therefore explores both the CEFD investor sentiment index and survey-based *consumer* confidence indexes. The two indexes have to rely on auxiliary maintained assumptions, but the assumptions are different:

- **Financial Measures:** The CEFD sentiment measures require the investor sentiment theory itself. The tests then measure consistency of one implication of the theory (the proxy extraction from the CEFD) with other implications (e.g., the rate of return on assets disproportionally held by noise traders). To the extent that other costs can matter to the CEFD (e.g., agency costs) or that smarter traders hold either a particular CEF or the underlying assets, the proxy identification can be weak. With both the test and the proxy based on financial data—the CEFD is essentially a book-to-market ratio—it is also relatively more likely that another theory could eventually offer an explanation for both findings, but one that is different from sentiment.[2]

- **Survey Measures:** The survey-based sentiment indexes require an identification of consumers as being the individual retail investors that DeLong, Shleifer, Summers,

[2]For example, it could be that there is a time-varying premium to liquidity and agency costs, that manifests itself in both small firms and CEFs. Spiegel (1997) and Berk and Stanton (2004) have recently proposed a rational explanation for some of the time-pattern in the CEFD. (It does not explain the original CEF *premium* or the correlation between the size or retailstock premium and sentiment.)

and Waldmann (1990) and Lee, Shleifer, and Thaler (1991) identify as noise traders. Furthermore, they require that consumption and investment sentiments are positively correlated. It is conceivable—but probably unlikely—that optimistic individuals are optimistic about consumption and pessimistic about investment. More likely, exuberance would translate into both consumption and investment optimism. Fortunately, we have some data to test this: some regular surveys of investors have recently appeared, which allow us to relate consumer confidence measures to investor sentiment measures.

In particular, we find that changes in the *UBS/Gallup* survey of investors' sentiment index correlates strongly positively with changes in the consumer confidence indexes, especially the Michigan consumer confidence index whose questions focus more on individual financial conditions than the Conference Board consumer confidence index. Further, the UBS/Gallup investor survey reveals no significant correlation between investor sentiment changes and CEFD changes. Both findings apply to both wealthy and poor investors. (Unfortunately, the UBS/Gallup investor survey has too short a history to permit us to rely on it for our full investigation.)

Our data spans from the 1960s to the early 2000s, depending on data series, and is monthly in frequency. Our paper offers four primary findings:

1. **Measure Validation:** In general, we find that the two kinds of measures—survey-based and CEFD-based—cannot validate one another. The correlations are inconsistent and/or close to zero. The measures are different animals.

   As just mentioned, the UBS/Gallup survey measure of investor sentiment—both that of relatively wealthy investors and relatively poor investors—correlate well with the consumer confidence index. Investor sentiment does not correlate with the CEFD based sentiment index.

2. **Small-Firm Return Spread:** Lee, Shleifer, and Thaler (1991) suggest that a sentiment measure should correlate (contemporaneously) with the prices of those stocks that are hypothesized to be subject to more noise trader sentiment.

   Our first set of noise-traded stocks are smaller firms. We refer to the average return of the smallest capitalization decile of stocks minus the average return of the largest capitalization decile of stocks as the "small-firm return spread."

   - Decreases in the CEFD correlate statistically significantly positively with the small-firm spread, as predicted by the theory. However, the relationship has weakened significantly after 1985.
   - Increases in the Michigan consumer confidence index correlate statistically significantly positively with the small-firm spread, as predicted by the theory. The relationship remains strong after 1985.

- If January observations are excluded, the Michigan consumer confidence index performs equally well, but the CEFD loses all significance.
- On an annual frequency, despite a small number of observations, the correlations remain positive and statistically significant for both survey indexes.
- Both the Michigan consumer confidence and the CEFD index offer *unique* statistically significant explanatory power for the small-firm spread—and roughly of equal importance.

Our interpretation is that because the survey-based measures perform better in the second half of the sample than the CEFD-based measure, the relationship between the small firm spread and the survey-based sentiment measure "feels" more solid and stable than the equivalent relationship between the small firm spread and the CEFD-based measure.

3. **Retail-Stock Return Spread:** The second set of noise-traded stocks are firms held primarily by retail investors instead of by institutional investors. We obtained institutional holdings from 13(f) filings,[3] and entertained three different measures of the "retail-stock return spread." Sorted in terms of relevance predicted by the sentiment theory, we explore:

   (a) The return on stocks with zero institutional holdings minus the average return on all other stocks.

   (b) The return on stocks with zero institutional holdings minus the return on stocks in the top decile of institutional holdings of the remaining stocks.

   (c) The return on stocks with zero institutional holdings *and* within this set of stocks ranked in the lower half of dollar trading volume, minus the return on stocks in the top two deciles of institutional holdings, and within each decile ranked in the upper half of dollar trading volume.

   We find

   - There is no correlation between the three retail-stock return spreads and changes in the CEFD. The point estimates are often perverse from the theory's point of view.
   - The Michigan consumer confidence index correlates significantly positively with the three retail-stock return spreads, and in strength as predicted by the theory.
   - It is important to control for market-wide movements in these regressions, because retail stocks performed worse when the stock market performed better, and the stock market performed better when consumer confidence increased.

[3] Under the Securities Exchange Act of 1934 (Rule 13(f)), institutional investment managers who exercise investment discretion over accounts with publicly traded securities (section 13(f) securities) and who hold equity portfolios exceeding $100 million are required to file Form 13(f) within 45 days after the last day of each quarter. Investment managers must report all holdings in excess of 10,000 shares and/or with a market value over $200,000.

4. **Closed End Fund Startups**: Closed-end fund inceptions from the Thomson data base do not appear to correlate with closed-end fund discounts. If anything, on an annual basis, closed-end fund IPOs may appear more often when the Michigan consumer confidence index increases. This finding seems too good to be true—but it is in the data.

We also present some evidence of mild feedback effects between consumer confidence and stock returns—a desirable feature of a sentiment index. In sum, our evidence suggests that sentiment plays a role in financial markets, but that the CEFD may be the wrong measure of sentiment.

Some final words of caution: Our paper has nothing to say about causality—whether sentiment (in the form of the CEFD or in the form of consumer confidence) "drives" financial markets or vice-versa. If anything, both may be driven by an underlying unmeasured variable, sentiment, or something even deeper. And we would also expect feedback loops: when the stock market drops, it may cause a drop in investor and consumer confidence, which in turn can cause a further drop in the stock market, and so on. We can only investigate a necessary *but not a sufficient* test for whether sentiment plays a role in financial market.

I Data Description

Our primary focus is on two measures of investor sentiment—the closed-end fund discount ("financial measure") and the consumer confidence ("survey measure")—for which we have reasonably complete monthly data series.

[Insert Table 1 (*Descriptive Statistics*) about here]

Table 1 lists the univariate characteristics of our series, including data availability. We shall now describe them.

A The Closed-End Fund Discount Indexes

Our first measure is the traditional investor sentiment measure in the finance literature, which is based on the **closed-end fund discount** (CEFD). Both Lee, Shleifer, and Thaler (1991) and Ross (2002) generously shared this data with us; descriptions of their constructions can be found in their respective papers. Our intent is to work with one long series, rather than with two separate series. Ex-ante, both sources provide equally valid measures of the CEFD. Our only concern is that the splicing the two series into one series introduces sharp discrepancy that are calculation based, especially around the breakpoints.

For the 72 months in which we have both the Ross (2002) closed-end fund data and the Lee, Shleifer, and Thaler (1991) data, the correlation between their value-weighted measures is 95%, The value-weighted regression coefficients are

$$\text{Ross CEFD Measure}_t \;=\; -0.21 \;+\; 0.973 \cdot \text{LST CEFD Measure}_t \;+\; \text{Noise}_t \qquad . \qquad (1)$$

The correlation between the two sources' equal-weighted CEFD measures is "only" 83%, however. Nevertheless, this is a comfortingly close to a one-to-one relation with a high R^2. The correlations actually seem remarkably high, given that there is no standard as to which CEFs are included. Moreover, around the breakpoints where the two series overlap, we see

Month	Ross	LST	Predicted	Average
1980-01		16.96%		
1980-02	15.78%	18.85%	18.13%	17.31%
⋮	⋮	⋮	⋮	⋮
1985-12	2.10%	4.17%	3.85%	3.13%
1986-01	7.16%			

Can we average the two series? The difference between the Ross and LST series has a median of –0.30%, a mean of –0.44%, a standard deviation of this difference of 2.3%, and an interquartile range of –1.95% to +1.34%. Further, the typical month-to-month standard deviation for LST is 2.3%; for Ross 2.7%. Therefore, around the 1980 break, the average of 17.31% differs from the regression prediction of 18.13% by about 0.8%, which is a discrepancy of about 0.36 extra standard deviations in the time series between using an average and the prediction. The 1985 break point shows even less discrepancy. We also confirmed that none of our results is sensitive to omission of the observations adjacent to the breakpoints.

We convert the CEFD into a sentiment measure—so we can talk about sentiment improvements and sentiment increases—by using the negative of the CEFD, which is thus called bullish.cefd. The prefix "d." denotes a first difference of monthly values. The suffix "vw." ("ew.") denotes value-weighted (equal-weighted). Therefore, our naming convention demands that we call the first differences in the negative of the CEFD d.bullish.cefd.vw

and d.bullish.cefd.ew for the value-weighted and equal-weighted discounts, respectively. In subsequent tests, we rely on equal-weighted CEFD changes, because they tend to work better than value-weighted CEFD changes.

Table 1 shows that the typical CEFDs, both equal-weighted and value-weighted, in our sample was around 10%, ranging from about +25% (in mid 1979) to –14% (at the turn of 1968/69). The average sentiment change was just about zero, with a typical month-to-month standard deviation of 2%. Drops in the CEFD in excess of 8% occurred in March 1968, November 1976, and August 1998. Increases in excess of 7% occurred in November 1967, January 1974 and September 1998.

B The Consumer Confidence Indexes

We have two different consumer confidence measures: The *Michigan Consumer Confidence Index*, and the *Conference Board Consumer Confidence Index*. Both are released monthly, and enjoy great prominence. The following descriptions borrow heavily from the websites of the providers and from the *Market Harmonics* website.

The Michigan Consumer Confidence Index is run by the the *Michigan Consumer Research Center*. It focuses on five questions:

1. "We are interested in how people are getting along financially these days. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago?"
2. "Now looking ahead—do you think that a year from now you (and your family living there) will be better off financially, or worse off, or just about the same as now?"
3. "Now turning to business conditions in the country as a whole—do you think that during the next twelve months we'll have good times financially, or bad times, or what?"
4. "Looking ahead, which would you say is more likely—that in the country as a whole we'll have continuous good times during the next five years or so, or that we will have periods of widespread unemployment or depression, or what?"
5. "About the big things people buy for their homes—such as furniture, a refrigerator, stove, television, and things like that. Generally speaking, do you think now is a good or bad time for people to buy major household items?"

Answers are coded on a scale from 1 (good) to 5 (bad), and averaged (equal-weighted). The reported Michigan consumer confidence index is a linear transform thereof.

The survey methods themselves are described in detail by Curtin (2000). An excerpt:

> The monthly survey of consumers is an ongoing nationally representative survey based on approximately 500 telephone interviews with adult men and women living in households in the coterminous United States (48 States plus the District of Columbia). The sample is designed to maximize the study of change by incorporating a rotating panel sample design in an ongoing monthly survey program. For each monthly sample, an independent cross-section sample of households is drawn. The respondents chosen in this drawing are then reinterviewed six months later. A rotating panel design results, and the total sample for any one survey is normally made up of 60% new respondents, and 40% being interviewed for the second time. The

> rotating panel design of the Surveys of Consumers has several distinct advantages over a simple random sample. This design provides for the regular assessment of change in attitudes and behavior both at the aggregate and at the individual level. The ability to gauge individual change expands the study of aggregate change by permitting a better assessment of the underlying causes of that change. The rotating panel design also permits a wide range of research strategies made possible by repeated measurements. In addition, the sample design supports the pooling of up to six of the independent monthly samples to achieve larger samples, or to screen for rare populations or events.

The telephone sample is obtained by list-assisted random sampling. A great deal of consideration has been expended on appropriate sampling. Further, the survey documentation gives great emphasis to demographic sampling, sampling error, sample coverage and non-response errors, sample weighting questionnaire design, telephone interviewing (and interviewer training), coding methods, and institutional independence. Interviews are spread rather evenly across the entire month, and the survey is never revised.

The **Conference Board Confidence Index** (survey) is run by *NFO Research, Inc., of Greenwich, Connecticut* on behalf of the *Conference Board*. The questionnaires are mailed to a nationwide representative sample of 5,000 households, of which roughly 3,500 typically respond. Each month, a different panel of 5,000 households is surveyed. The index is based on responses to five questions included in the survey:

1. Respondents' appraisal of current business conditions.
2. Respondents' expectations regarding business conditions six months hence.
3. Respondents' appraisal of the current employment conditions.
4. Respondents' expectations regarding employment conditions six months hence.
5. Respondents' expectations regarding their total family income six months hence.

For each of the five questions, there are three response options: positive, negative, and neutral. The response proportions to each question are seasonally adjusted. For each of the five questions, the positive figure is divided by the sum of the positive and negative to yield a proportion, which the survey calls the "relative" value. For each question, the average relative value for the calendar year 1985 is then used as a benchmark to yield the INDEX value for that question. The reported consumer confidence index is the average of all five indexes: the present situation index; the average of indexes for questions 1 and 3; the expectations index: the average of indexes for questions 2, 4, and 5. The Consumer Board releases a preliminary average, often during the month of sampling, and a final (thus revised) number after the month end. Our paper relies on the final estimates only.

Upon reflection—and borne out in our later data analysis—the two confidence indexes differ in their emphasis. The Michigan index focuses more on financial conditions (and especially the individual's own condition), while the Conference Board index focuses more on macroeconomic conditions. Thus, for our purposes, the Michigan index is more suitable.

Table 1 shows that the average Michigan consumer confidence index is around 90, the average Conference Board consumer confidence index is around 100. The most bullish Michigan indexes in the sample occurred in Feb 1998, and from Jan through May of 2000. The most bearish time occurred in April and May of 1980.

We usually work with sentiment changes, the first difference in the Michigan consumer confidence index, called d.bullish.mich; and the first difference in the Consumer Board consumer confidence index, called d.bullish.cb. The former has a month-to-month standard deviation of around 3, the latter of around 6. The Michigan confidence index had the most pronounced drops in Dec 1980 and Aug 1990, and the most pronounced improvements in Jan 2004, Mar 1991, and Nov 1992.

[Insert Figure 1 (*Time Series of Sentiment Measures*) about here]

Figure 1 plots the time-series of *annual* observations for our sentiment measures. There seems to be no correlation between the Michigan consumer confidence index and the closed-end fund discount. Our explanatory variables, changes in these indexes (although we rely on monthly tests, not annual tests), similarly seem to not covary.[4]

C Other Monthly Survey Data (for Validation)

We also have some other survey data, which suffer from insufficiently long, insufficiently dense, and/or irregular data histories. Thus, they are not suitable as primary data series, but they are helpful in assessing and validating the meaning of the consumer confidence indexes as investor sentiment indexes.

The most important is the **UBS/GALLUP Index of Investor Optimism**. Since 1996, UBS and Gallup have conducted surveys of (random) investors with more than $10,000 in wealth. During the first two weeks of every month, Gallup conducts 1,000 interviews of investors and results are reported on the last Monday of the month. (For more information, see http://www.ropercenter.uconn.edu/ubs.html.)

> 6c. Now, I would like to ask you to think about the factors that could affect the overall investment environment OVER THE NEXT TWELVE MONTHS. On the same five-point scale, as far as the general condition of the economy is concerned, how would you rate (read and rotate A-D) Performance of the stock market, OVER THE NEXT TWELVE MONTHS? (NOTE TO INTERVIEWER: Do NOT repeat the scale unless it is necessary to remind the respondent. If respondent says "optimistic" or "pessimistic", be sure to clarify if that is "very" or "somewhat").

[4] We also tried to extract the first principal component of the two consumer confidence measures (and/or from their changes), and see how it works. It did not work any better. The loadings are about $0.93 \cdot \text{cb} + 0.36 \cdot \text{mich}$, both in levels and differences, and the michigan one just works better than the cb one.

Value	Label
1	very pessimistic
2	somewhat pessimistic
3	neither
4	somewhat optimistic
5	very optimistic
6	don't know
7	refused
8	no answer

Another question (S5) provides a classification into investors with more than $100,000 in stock and bond investments (henceforth termed "wealthy"), and investors with less (henceforth termed "poor"). The total numbers are 22,687 "wealthy" investor-months and 29,987 "poor" investor-months.

We code a "very optimistic" as +2, a "somewhat optimistic" as +1, a somewhat pessimistic as –1, and a "very pessimistics" as a –2. Table 1 shows that the median / average score was 0.35 / 0.43, with a standard deviation of 0.29. The typical month-to-month variation in the UBS/Gallup poll was around 0.16. The most optimistic months were Dec 1999 to Feb 2000, the most pessimistic months were Jul and Oct 2002.

A reasonable critique of survey sentiment indexes is that they may unduly measure the optimism of small investors, which are not of importance to the stock market (although the DeLong, Shleifer, Summers, and Waldmann (1990) and Lee, Shleifer, and Thaler (1991) rely on identification of noise traders with small investors). Put differently, why should we believe that how the retiree in Mississippi changes her views should matter in any way to how the wealthy New York city investors change their perspectives?

With the UBS/Gallup investor wealth classification, we could determine one index based on wealthy investors only, and one based on poor investors only. There is no question that wealthy investors tend to be more optimistic (mean 0.41, median 0.51) than poor investors (mean 0.30, median 0.34). This difference is statistically highly significant. However, this difference is not important within our context.

The correlation among indexes based only on the "wealthy" and those based only on the "poor" investors: it is 97%. The mean difference is persistent and does not seem to vary much. Most importantly, the correlation between the first changes of the monthly wealthy-only investor sentiment index and of the monthly poor investor sentiment index is 80.4%. We then proceeded to bootstrap 10,000 random distributions of investors, in which we randomly identified 29,987 and 22,687 investors as poor and wealthy respectively, recomputed two indexes, their first changes, and took a correlation. The mean (median) correlation was 82.7% (82.3%). The observed 80.4% correlation sits at the 23rd percentile. Therefore, we can conclude that *there is no difference in how the investor sentiment of poor and wealthy investors changes month-to-month. Wealth is not a determinant of sentiment changes.* The critique that investor sentiment indexes based on poor investors do not accurately reflect the investor sentiment of wealthier investors is thus rejected.

An even more recent survey is the **Investor 1-Year Confidence (Semi-Annual to 2002, Monthly Thereafter)**, run by the Bob Shiller through the *Investor Behavior Project at Yale University*. We briefly explore the Shiller category of *1 year confidence: The percent of the population expecting an increase in the Dow in the coming year*. We have this number only for institutional investors. (The individual series has way too few observations.) The first survey occurred in October 1989, then was semi-annual until January 2002, when it became monthly. Within the monthly series, the typical Shiller index was about 75, with the standard deviation of month-to-month changes of about 2.5. Its most bullish observation occurred in Apr 2001, its most bearish observation in Apr 1990.[5]

D A Sidenote on Annual Surveys

We also briefly explored three additional indexes, which exist only in annual form. Therefore, we do not have enough data to explore them in more detail.

The **Happiness** index in the *General Social Science Survey*, administered by the *Inter-University Consortium for Political and Social Research (ICPSR)* at the *University of Michigan*, the *National Opinion Research Center (NORC)* at the *University of Chicago*, and the *Roper Center for Public Opinion Research* at the *University of Connecticut*. Question 157 (mnemonic "HAPPY," identified as *General Happiness*) is

> "Taken all together, how would you say things are these days would you say that you are very happy, pretty happy, or not too happy?"

There are 3 answers ("very happy", "pretty happy", "not too happy") in addition to "don't know" and "no answer." There were about 40,000 responses in the survey, split over 9 surveys. The question was first asked in 1972, so answers first arrived in March 1973.

We find that annual changes in this happiness index correlate positively with changes in both consumer confidence indexes (30% to 35%, t-statistic of 1.5 to 1.9). However, they correlate perversely with the negative of the closed-end fund discount indexes (–43%, t-statistic of -2.4)—when the CEFD turns more bullish, happiness turns into unhappiness.

The **Luxury Consumption Retail Sales Growth** from Ait-Sahalia, Parker, and Yogo (2004) explores the combined US sales growth for Tiffany (since 1960), Saks (since 1991), Bulgari (since 1992), Gucci (since 1991), Hermes (since 1992), LVMH (since 1993), and Waterford Wedgwood (since 1994).

[5] The Shiller index does display some strange features in its semiannual period: it was very bearish when markets were generally held to be very exuberant, i.e., late 1999 and early 2000. In this period, it correlates negatively with any other confidence and sentiment index, and not at all with the CEFD. More information on the indexes can be found at http://icf.som.yale.edu/confidence.index/ and http://cowles.econ.yale.edu/-news/shiller/rjs_02-03-12_som_confidence.htm.

We find that luxury growth correlates positively with both financial and survey sentiment increases, but significantly so only with Conference Board consumer confidence increases.

The **BW Sentiment Index** is provided in Baker and Wurgler (2004) It is essentially the first principal component of six sentiment measures:

$$\begin{aligned} \text{SENTIMENT} \;=\; & -0.358 \cdot \text{Closed End Fund Discount(t)} \\ & +0.402 \cdot \text{NYSE Turnover(t-1), logged, detrended} \\ & +0.414 \cdot \text{Number of IPOs(t)} \\ & +0.464 \cdot \text{Average First Day IPO(t-1) Return} \\ & +0.371 \cdot \text{Share of Equity in Total Aggregate Issuing} \\ & -0.431 \cdot \text{Dividend Premium } P^{D-ND}\text{(t-1)} \quad . \end{aligned} \tag{2}$$

(Their dividend premium is the log difference of M/B ratio of payers minus M/B ratio of nonpayers.) Not surprisingly, the Baker and Wurgler index covaries positively with the closed-end fund discount (about 25% correlation). It also covaries equally well with the Conference Board consumer confidence index (28%)—but it does not covary with the Michigan consumer confidence index (–2%).

E Dependent Variables: Stock Return Data

Our three dependent variables are the (contemporaneous) performances of small stocks and retail-owned stocks and the startup of closed-end funds.

Small Stock Return Spread is the difference between the rate of return on the smallest-capitalization stocks and the largest capitalization stocks, based on the well-known CRSP decile portfolios. This variable is called smallstocks.retspread. Table 1 shows that small stocks did not outperform large stocks in our sample period. The typical month-to-month standard deviation was around 7%.

Retail-Stock Return Spread The institutional holding portfolios were formed from Thomson 13(f) data reports, each quarter end (March, June, September, and December), starting in 1980. Stocks are ranked using the holding data at the end of prior quarter; for example, January, February, and March groups are formed according to holdings in the prior December last year. We do not have holding data for Dec. 1979, so we can not form deciles beginning in 1980.

Firms with zero institutional holdings are grouped into their own category; the remaining stocks are grouped into deciles. We entertain three different measures, for which the theory predicts progressively higher explanatory power:

retailstocks.retspread1 The rate of return on the portfolio of zero-institutional holding stocks minus the rate of return on stocks with institutional holdings. (Portfolios are always equal-weighted.)

retailstocks.retspread2 The rate of return on the portfolio of zero-institutional holding stocks minus the rate of return of the highest institutional holding decile.

retailstocks.retspread3 Within each institutional holdings decile portfolio and within the zero-institutional holdings decile portfolio, stocks are sorted by dollar trading volume. We then create one portfolio of the low-trading volume zero-institutional holding stocks, and subtract off the high-trading volume high-institutional holding stock portfolio.[6]

These portfolio returns are called "retail-stock return spreads." The correlation among these three measures is between 73% and 90%. Table 1 shows that retail stocks performed about the same as institutional stocks, except *low-dollar-trading-volume* retail stocks which underperformed *high-dollar-trading-volume* retail stocks. The typical time-series standard deviation is relatively small, only about 3% to 5% per month.

Table 1 shows that the small-firm return data comes from a considerably longer time span (1965–2003) than the retail-stock return data (1980–2003). Therefore results based on retail-stock return spreads may be less reliable than results based on small stock spreads.

[Insert Figure 2 (*Time Series of Return Spreads and S&P500 Percent Changes*) about here]

Figure 2 plots the time-series of the (log of) the S&P500, the small-stock return spread, and the third retail-stock return spread *after* the S&P500 percent change has been hedged out (i.e., in-sample regression residuals). The two series do covary, but they also seem to have good independent components. Small stocks performed worst in 1990 and 1998, and best in 1967. Post-hedge retail and low-dollar-trading-volume stocks did worst in 2000, and best in 1995.

An important question is the degree to which these return spreads reflect the overall stock market. We therefore use the percent change in the S&P500 as control for market conditions. (It makes no difference whether dividends are included or not, or whether another market-index, such as the CRSP value-weighted index, is used.) This variable is called sp500.pctchg.

As noted by Lee, Shleifer, and Thaler (1991), the small-firm return spread is not correlated with the overall stock market rate of return—in our sample, its correlation with the S&P500 rate of return is +2%. Therefore, in correlations with the small firm spread, we are not just finding correlations with the stock market overall. However, our retail-stock return spreads have a very high negative correlation (around –33%) with the rate of return on the S&P 500. Thus, control for the overall market is important in explaining the retail-stock return spread, but not in explaining the small-stock return spread.[7]

[6]The unconditional spread is very high. This disappears if we value-weight the portfolios. However, our results remain robust. We are sticking to equal-weighted portfolios only for consistency.

[7]We also checked into correlations of our return spreads with 1-year interest rate and 1-year interest rate changes. They are invariably below 10% in absolute magnitude.

F Dependent Variable: Closed-End Fund Startups

Our final dependent variable are the **number of closed-end fund IPOs**. Unlike Lee, Shleifer, and Thaler (1991), our series of closed-end fund IPOs comes not just from the CEF returns data base, but from the more complete Thomson Financial's new securities issue data base. We specifically excluded funds with primarily international focus. Thus, the number of (domestically oriented) closed-end fund IPOs is called cef.startups. It is zero in many months. We also explore monthly differences in this variable, d.cef.startups and annual differences in this variable, d12.cef.startups.

II Results

A Cross Validation

[Insert Table 2 (*Sentiment Measure Validations*) about here]

Table 2 shows the correlation among measures of sentiment *changes*, for which we have sufficient monthly data. The CEFD-based financial sentiment changes have a correlation of about 80% with one another, much higher than the 52% correlation between the Michigan and Conference Board survey-based sentiment changes.

[Insert Figure 3 (*Michigan Consumer Confidence vs. Equal-Weighted CEFD*) about here]

More remarkable is that there is no correlation between the financial and survey based measure changes. The two seem to measure very different factors. The disconnect between CEFD based and survey based sentiment measure is not only in differences. Even in levels (both indexes are close to random walks), the two are different. (Correlations in levels are a necessary, but not sufficient validation of sentiment measure identification.) Figure 3 shows that in the sample before 1985 the investor sentiment was high when the consumer confidence was high (upward sloping lines, for overall sample and pre-1985), but the relationship reverses post 1985 (downward sloping line). An investor can therefore not reliably conclude from the current average CEFD where *consumer* confidence stands, and vice-versa.

The UBS/Gallup measure of investor sentiment helps to narrow the leap that we had to take in identifying consumers as our proxy for investors. Table 2 shows that the correlation between the UBS/Gallup measures and the Michigan index of 55% is considerably higher than the 38% correlation between the UBS/Gallup measures and the Conference Board index. This likely reflects the aforementioned differences in survey emphasis. The Michigan index focuses more on the individual's own situation: 2 of its 5 questions even mention the consumers' financial situation. The Conference Board index seems to be more

concerned with consumers' views of business conditions.[8] Moreover, we have a longer data series for the Michigan consumer confidence index than for the Conference Board consumer confidence index. For all these reasons, our subsequent analysis focuses on the Michigan consumer confidence index—a noisy but reasonable proxy for UBS/Gallup investor sentiment.

In contrast, the financial CEFD-based sentiment measures do not correlate statistically significantly with the UBS/Gallup investor survey measures. Thus, in order to consider the CEFD an investor sentiment measure, an auxiliary assumption must be that the (relevant) investors do not articulate their sentiment in Gallup's survey.

B Explaining The Small-Firm Return Spread

[Insert Table 3 (*Small-Firm Return Spread*) about here]

Table 3 explains the small-firm return spread, the difference between the rate of return on the smallest and largest firms. Changes in the Michigan and the CEFD sentiment indexes have statistically significant contemporaneous explanatory power. (Table 3 indicated that the two measures are almost uncorrelated, which means that the coefficients and significance levels on one remain practically the same if we exclude the other.) Over the full sample period, the closed-end fund discount slightly edges out the Michigan confidence index in terms of significance. A one standard deviation higher decrease in the CEFD associates with a 21.3% higher standard deviation increase in small-firm return spread, while a one standard deviation higher decrease in the Michigan survey associates "only" with an 18% higher standard deviation increase in small firm return spread.

However, the subsamples show that the CEFD has mostly lost its contemporaneous explanatory power for the small stock return spread after 1985. The sign remains positive, but the significance drops. In contrast, the Michigan consumer confidence survey actually improved in its ability to explain the small stock return spread.

The bottom half of Table 3 excludes January observations, long known to be peculiar. The closed-end fund discount seems to have explanatory power only if January observations are included. Without January observations, only the Michigan consumer confidence index remains significant.

We interpret this evidence to suggest that the Michigan consumer confidence index is a more stable and thus better measure of sentiment than the closed-end fund discount, at least as of 2004.

[8] Not reported, compared to the Michigan index, the Conference Board index correlates generally more with macroeconomic variables such as GDP changes and unemployment changes, and generally less with financial variables such as interest rate changes, S&P500 returns, excess returns, etc.

C Explaining The Retail-Stock Return Spread

[Insert Table 4 (*Retail-Stock Return Spread*) about here]

Table 4 explains the differences between the rate of return on firms that have no institutional holdings (13(f) filings) and the rate of return on firms that have institutional holdings. (Both portfolios are themselves equal-weighted.) The table shows that when consumers turn more bullish, "retail stocks" outperform "institutional stocks." A one-standard deviation increase in the survey sentiment associates with an 0.4 standard deviation increase in the retail-stock return spread prior to 1985, and with an 0.1 standard deviation increase post 1985. In contrast, the financial sentiment measure comes in with a perverse sign and no statistical significance.

It is important to point out that in these regressions, control for the overall market rate of return is important. (Our results are virtually identical if we use the CRSP value-weighted stock market rate of return rather than the S&P500 percent change.) Retail stocks had an inverse correlation with the S&P500 return in our sample period, and a more bullish consumer confidence also associated with a higher stock market. The consumer confidence index can explain the performance of retail held stocks after the stock market is hedged, but not in itself.[9]

[Insert Table 5 (*Retail-Stock Return Spread, Top Decile*) about here]

Table 5 sharpens the distinction between stocks that are primarily retail-held vs. stocks that are primarily institutionally-held. The latter now represent only the top decile of firms, according to dollar institutional holdings. Consistent with the theory, the significance of the Michigan consumer confidence index rises. It is now easily statistically significant, even in the post-1985 subsample. In contrast, the CEFD remains insignificant.

[Insert Table 6 (*Retail Low-Trading Stock Spread*) about here]

Table 6 further sharpens the theoretical prediction. It distinguishes between stocks that are primarily retail-held and rarely traded, and stocks that are primarily institutionally-held and heavily traded. The former are now only the firms that rank in the bottom half of dollar trading volume (which would make market efficiencies more difficult to arbitrage), while the latter are now the two top institutionally held deciles, but only those firms that rank in their decile's top half of dollar trading volume. Again, consistent with the theory, we find that the statistical power of the consumer confidence index increases further. The

[9] We can attribute all power that is joint between the sentiment measures and the S&P500 to the latter if we first run a regression to hedge retail stock returns, and then work with the residuals. If we do so, the Michigan consumer confidence measure remains strong and significant, and the CEFD still has no explanatory power. We can also eliminate the small-stock spread with such a procedure, thereby asking how much we can explain that neither the S&P500 nor the small stock return can explain. In this case, only our final measure of retail-stock return spread (which incorporates trading activity) remains statistically significant.

CEFD based sentiment index now almost comes in significant in the second subsample (and is statistically significant at conventional levels on a one-sided test), but it remains insignificant in the overall sample.

[Insert Table 7 (*Retail Low-Trading Stock Spread, Value-Weighted*) about here]

Table 7 shows that the effect is robust if we use value-weighted portfolios, rather than equal-weighted portfolios within each classification. Not reported, the findings are also robust if we exclude all January observations.

[Insert Table 8 (*Retail Low-Trading Stock Spread, Size Controlled*) about here]

A natural question is to what extent our retail-stock return spread findings are different from our small-firm return spread findings. Many small firms have no filings of any institutional holdings, and virtually all large firm have institutional holdings. Therefore, in Table 8 we add the small stock return spread to our previous regression. The table shows that the stock return phenomena are indeed linked: especially prior to 1985, small stock returns correlated heavily with retail-stock returns. The inclusion of small stock returns means that our overall sample's consumer confidence variable is still significantly positive, but it is now less important. Comparing the coefficients to those of the previous Table 8, about one-third of the economic influence of the consumer confidence index on retail stocks is due to its ability to explain small stock returns, the remaining two-thirds are novel.

Not reported, we also explored annual changes. We only have 30 observations to explore the small stock return spread, and 20 observations to explore the retail-stock return spread. Annual changes in both financial and consumer confidence indexes can statistically significantly explain the small-stock return spread. However, the retail-stock return spread is just barely explainable by consumer confidence in a one-sided test (the t-statistic becomes 1.63).

In sum, we interpret the overall evidence to suggest that consumer confidence indexes play a role in explaining the performance of small stocks, retail-held stocks, and stocks that are more difficult-to-arbitrage. In contrast, the CEFD does not seem to play such a role.

D Persistence (Prediction)

We would argue that a reasonable sentiment index could be influenced by recent positive stock returns—and especially recent high overall stock market (portfolio) returns, and have (mild) persistent effects on return spreads. The following are the t-statistics on the correlations between changes in our sentiment measures, and our monthly rates of return of interest:

	Lag of Small Stock Return Spread										
	–5	–4	–3	–2	–1	0	+1	+2	+3	+4	+5
d.bullish.mich	–1.7	–1.3	–1.5	0.0	+1.6	+3.9	+1.7	+1.8	–0.7	+1.0	+0.4
d.bullish.cefd	–0.5	+0.9	–0.9	–0.5	+1.0	+4.7	–0.7	–1.3	–1.6	+1.1	+2.1
	Lag of Market-Adjusted Low-Trade Retail Stock Return Spread										
	–5	–4	–3	–2	–1	0	+1	+2	+3	+4	+5
d.bullish.mich	–0.4	–1.0	+0.6	+3.3	+0.9	+3.7	–0.5	+0.1	+0.4	+0.7	–0.8
d.bullish.cefd	–0.0	+2.0	–1.3	+2.7	–0.3	+1.0	–2.2	–0.2	–0.6	+0.4	+0.3
	Lag of S&P500 Percent Change										
	–5	–4	–3	–2	–1	0	+1	+2	+3	+4	+5
d.bullish.mich	+0.6	–1.5	–0.9	+0.5	+0.5	+3.8	+5.2	+3.6	–1.2	–1.1	+1.3
d.bullish.cefd	+1.4	–0.6	–0.2	–1.0	+0.5	+2.4	+0.2	–1.9	–0.9	+0.6	+0.3
	(sentiment anticipates return)						(return anticipates sentiment)				

In a Granger causality sense, significant numbers on the left imply that the sentiment index predicts (influences) the return, numbers on the right imply that the sentiment index is predicted (influenced) by the return. The market-adjustment in the middle panel is done by hedging out the in-sample S&500 return via regression. (The numbers are similar for other retail spreads.)

The CEFD-based sentiment measure has very little persistence. The effects of changes in the Michigan consumer confidence index seem to both be influenced by the lagged small stock return spread and influence the future small stock return spread. The relationship is even stronger for the influence of past market-wide rate of returns. We would argue that the consumer confidence correlation patterns are desirable characteristics for an investor sentiment index.

Independently, Durell (2001) has worked on similar questions, primarily related to issues of long-term correlations of overall stock market returns with consumer confidence indexes. The paper is different from our own not only in emphasis (he explores the relation between the market and the consumer confidence index in more detail than our one subsection here), but also in some findings—not all his findings are similar to our own. From our perspective, most importantly, he finds a theoretically reasonable correlation between one component of the Conference Board consumer confidence index and the CEFD. This—and some other mild differences in results—may be partly due to differences in specifications (he tends to use longer-term returns), partly due to data (he uses only the Conference Board index and only one component thereof), and partly due to sample

period (he has overlapping data for the CEFD and the Conference Board for only 7 years, 1978–1985).

E Closed-End Fund Startups

[Insert Table 9 (*Monthly Closed-End Domestic Fund Startups (IPOs)*) about here]

Panel A of Table 9 explains domestically oriented closed-end fund startup activity. To be interesting, like the CEFD sentiment measure itself, the use of this variable has to rely on the identification of closed-end funds with noise investors. The table shows that neither the consumer confidence index nor the closed-end fund discount seems to reliably explain IPOs. Actually, this should not be too surprising: it takes time to start up a fund, and a single month's bullishness is not likely to translate into immediate fund startups (although funds could be "waiting in the wings" until investors turn more bullish).

[Insert Table 10 (*Annual Closed-End Domestic Fund Startups (IPOs)*) about here]

A more reasonable test relies on annual data. Unfortunately, we do not have much annual data, so our test results should not be overread. Panel B of Table 10 shows that annual changes in the CEFD cannot explain the contemporaneous level of closed-end fund startups. Surprisingly, more bullish consumers may be able to! The correlation drops just below two-sided statistical significance if we include both measures, but remains nevertheless suggestive. In general, we do not consider this to be a robust relationship. On shorter horizons, the correlations of both bullish variables drop, on longer horizons (up to 18 months), the correlations increase. (If we log the dependent variable, we lose another 20 basis points on the T-statistics, thereby dropping below ordinary statistical significance.)

Nevertheless, this remains a puzzling finding—and too good to be true: under almost any hypothesis, we would have expected closed-end funds not to start up if the closed-end fund discount is high, and closed-end funds to start up if the closed-end fund discount is low or negative. Being a very different variable, we were not expecting the consumer confidence to play much of a role, but apparently it does. In this context, we want to reemphasize that it is likely that fund startups correlate with the consumer confidence only because the (consumer) sentiment correlates with another unidentified variable.

F Other Correlations

F.1 Market Returns

In months in which sentiment improves, the S&P500 index moves higher. Changes in the Michigan consumer confidence index shows the strongest and a stable correlation (of 18%), followed by changes in the CEFD-based sentiment (about 10-12%, although the relationship is an unstable 0% before 1985, and 20% after 1985), and finally the Conference Board index (9%, not significant and unstable). Of course, this is contemporaneous, so no arbitrage is to be earned here. A believer in sentiment would argue that this shows that there is a strong sentiment factor in the overall stock market—although, as for small firms and retail firms, it is not clear which drives which.

F.2 Macroeconomic Factors

GDP is difficult to work with, because it is not a monthly series. The unemployment rate is easier to handle. However, exploring GDP changes and unemployment changes is not unimportant. Changes in GDP correlate only modestly well with unemployment changes; for example, 1974–1975, and 1980 suffered from large unemployment increases despite good GDP growth.

When we interpolate quarterly GDP levels into monthly levels, we find that there is very little correlation between monthly changes in the CEFD and monthly changes in GDP. In contrast, changes in both the Michigan and the Conference Board consumer confidence index and changes in GDP correlate significantly positively (around 10 to 15%).

When we work with changes in unemployment, we find that, although not strong, there is a suggestion (sometimes statistically significant, sometimes not) that the CEFD measure turns more bullish as the unemployment rate goes up. This is somewhat perverse: though we do not have numbers for employment of wealthy investors, it is nevertheless hard to imagine a noise (retail) trader optimism index that goes up as the investors themselves are laid off. In contrast, the Conference Board consumer confidence index increases when unemployment decreases. (The Michigan index display no correlation with unemployment changes.)

F.3 Book Market Returns

It is straightforward to correlate the Fama-French book-market factor—available from Ken French's website—with changes in the two sentiment indexes. Of course, the CEFD is itself in essence a book-market derived variable, albeit only for closed end funds. Therefore, we find that there is a statistically significant and persistent relation between changes in the CEFD and the book-market return spread. There is no systematic relation between the survey-based measures and the book-market factor.

F.4 Interest Rates

The average 1-year interest rate in our sample was about 6.7%. There is a mild correlation between the CEFD and monthly 1-year interest rate changes: when the CEFD decreases (more bullish), so does the interest rate. The relationship is not strong, and just marginally statistically significant. In contrast, changes in both consumer confidence measures correlate strongly positively with changes in interest rates: consumers turn more bullish when interest rates rise, or vice-versa.

F.5 Other Findings

IPO activity is sometimes considered a measure of financial sentiment. However, we detect no solid systematic contemporaneous relationship between sentiment measures and general IPO issuing activity, or IPO returns on a monthly basis. Similarly, we find no systematic relation between overall market trading volume and our sentiment measures.

We also tried to explain the closed-end fund discount with returns and our consumer confidence measure (d.bullish.mich), thus turning our regression around. The normalized coefficients are

$$\begin{array}{rcccccccc} \text{d.cefd.ew} & = & -0.001 & + & (+0.026)\cdot\text{d.bullish.mich} & + & (-0.119)\cdot\text{retailstocks.xret} \\ t: & & -0.75 & & 0.39 & & -1.55 \\ & & & + & (-0.107)\cdot\text{smallstocks.xret} & + & (+0.168)\cdot\text{s\&p500.xret} \\ t: & & & & 1.57 & & 2.32 \end{array} \tag{3}$$

Only the S&P500 rate of return is statistically significant, though the rate of return on small stocks reaches a full-sample t statistic of about 1.6. Prior to 1985, if we omit retailstocks.xret, smallstocks.xret is the strongest explanatory variable (t of 5.21) and the market return is irrelevant ($t = -0.72$); after 1985, the small stock return spread becomes insignificant (t of 0.74), while the S&P500 rate of return becomes strongly significant ($t = 4.05$).

On an annual basis, we find one odd correlation: in levels, the CEFD correlates highly (and statistically significantly) with the market-adjusted retail-stock return spread. In fact, this can be inferred by overlaying the second panel in Figure 1 on the third panel in Figure 2. This relationship might have made sense if it had occurred in annual *changes*, but it does not make sense when in levels.

III U.K. Data

Doukas and Milonas (2004) report that the closed-end fund discount fails to explain small stock excess returns in Greece. Although we do not have access to Greek data, we are able to do some preliminary exploration of our relationship in the United Kingdom, because Dimson, Nagel, and Quigley (2004) kindly made their U.K. decile portfolio return data (1955-2001) available to us. As with U.S. data, we compute an excess rate of return of small firms over large firms. There are 4 months in which the excess return exceeded +20%, among them 35% in November 1999, and 24% in January 2000. There was only 1 month in which the return was significantly below −10%, which was −19% in December 1999. (The next smallest excess returns were -10.6%.) These returns were about 4 standard deviations off the series mean,[10] which leads us to believe that the 11/99 to 01/00 period was highly unusual and perhaps not representative. Therefore, it is probably appropriate to exclude these three months or winsorize them. As our proxy for the market rate of return, we use the rate of return on the FTSE index.

The European Commission publishes consumer confidence data, beginning in January 1985. This means that we only have 204 data points with both consumer confidence and stock return data to work with. The EC data contains not only the general consumer confidence indicator (CC, series 99), but also a financial situation indicator (FSI, series 01), and a general economic situation indicator (ESI, series 03). The change in CC has a mean of 0.04 and a standard deviation of 3.2; the change in FSI (ESI) has a mean of 0.10 (0.10) and a standard deviation of 2.6 (4.9).[11]

Reporting all coefficients in percent, explaining contemporaneous small firm excess returns, we find that

Explaining U.K. Small Firm Excess Returns With Changes in Consumer Confidence

Full Sample	0.628	+	$0.158 \cdot \Delta CC$	+	$(-5.76) \cdot R_{FTSE}$	+	ϵ
t-stat	(1.35)		(1.08)	+	(-0.59)		
excl. 11/99-01/00	0.498	+	$0.308 \cdot \Delta CC$	+	$(-13.55) \cdot R_{FTSE}$	+	ϵ
t-stat	(1.23)		(2.43)	+	(-1.61)		
winsorized at $\pm 2\sigma$	0.360	+	$0.219 \cdot \Delta CC$	+	$(-7.10) \cdot R_{FTSE}$	+	ϵ
t-stat	(0.95)		(1.84)	+	(-0.90)		

The t-statistics on changes in confidence improve to 2.00, 2.83, and 2.60 if we replace changes in consumer confidence (CC) with changes in the economic situation indicator (ESI). This evidence is fairly supportive. But before we can declare victory, we need to repeat this exercise with the financial situation indicator.

[10] The mean excess return was 0.6% per month with a standard deviation of 6.5%.

[11] The EC also publishes forward looking statistics, and the results are reasonably similar to those reported below.

Explaining U.K. Small Firm Excess Returns With Changes in Financial Situation							
Full Sample	0.630	+	$0.046 \cdot \Delta\text{FSI}$	+	$(-5.75) \cdot R_{\text{FTSE}}$	+	ϵ
t-stat	(1.35)		(0.26)	+	(-0.59)		
excl. 11/99-01/00	0.491	+	$0.147 \cdot \Delta\text{FSI}$	+	$(-13.09) \cdot R_{\text{FTSE}}$	+	ϵ
t-stat	(1.20)		(0.97)	+	(-1.53)		
winsorized at $\pm 2\sigma$	0.360	+	$0.219 \cdot \Delta\text{FSI}$	+	$(-7.10) \cdot R_{\text{FTSE}}$	+	ϵ
t-stat	(0.94)		(0.70)	+	(-0.89)		

Although the sign is correct, we had expected more statistical significance, not less. This leaves us with a mystery, that will require an analysis beyond what we can accomplish in our paper—and probably a longer data set.

IV Conclusion

The financial CEFD-based sentiment measures and the survey-based consumer confidence sentiment measures have very little mutual correlation. If we try to validate either on the other, we fail. For the short period in which we have UBS/Gallup investor sentiment data, we find that the Michigan consumer confidence index is the only good measure of UBS/Gallup investor sentiment.

When we try to explain the small-stock return spread with sentiment changes, we find that the Michigan consumer confidence proxy performs almost as well as the CEFD-based proxy. Moreover, their influences on the small-stock spread is orthogonal. Although the consumer confidence index is slightly weaker than the CEFD index in the overall sample, it remains strong after 1985 while the CEFD index does not.

When we try to explain the retail-stock return spread or the retail-stock low-trading return spread, we find that only the Michigan consumer index behaves according to the predictions of the sentiment theory. When consumers become more bullish, small stocks, retail stocks, and illiquid retail stocks outperform their counterparts, controlling for market rates of returns. CEFD-based indexes have no explanatory pwoer.

None of our variables could reliably explain the startup of domestic closed-end funds on a monthly basis, although there is a hint that the Michigan consumer sentiment index performs better than the closed-end fund index on an annual basis—a surprising finding.

We also report some preliminary evidence suggesting that changes in the consumer confidence can explain small firm excess returns in the United Kingdom.

We close with some editorializing. We are very sympathetic to a role for sentiment in closed-end funds. In particular, we believe that it will be difficult to find a rational alternative explanation for why investors originally purchase domestic closed-end funds at a premium, which then moves to a discount over the following 12 months—with an associated frighteningly negative average rate of return for their investors. (We use the term

"behavioral" loosely, because it could also be that agency issues are the reason why advisors place their clients' trust funds into these closed-end funds.) However, for future research studies, if an investor sentiment measure is called for, we would highly recommend the use of the Michigan consumer confidence index over the use of a closed-end fund discount based sentiment index.

We are currently looking for other high-quality international size-decile portfolio return series. If you know where to find high-quality ones, please drop us an email.

References

Ait-Sahalia, Yacine, Jonathan Parker, and Motohiro Yogo, 2004, Luxury Goods and the Equity Premium, *The Journal of Finance* 59, forthcoming.

Baker, Malcolm, and Jeffrey Wurgler, 2004, Investor Sentiment and the Cross Section of Stock Returns, Working paper, Harvard Business School and New York University.

Berk, Jonathan B., and Richard Stanton, 2004, A Rational Model of the Closed-End Fund Discount, Working paper, Haas School at the University of California at Berkeley.

Chen, Nai-Fu, Raymond Kan, and Merton H. Miller, 1993, Are the discounts on Closed-end Funds a Sentiment Index, *The Journal of Finance* 48, 795–800.

Chopra, Navin, Charles M.C. Lee, Andrei Shleifer, and Richard H. Thaler, 1993, Yes, Discounts on Closed-End Funds are a Sentiment Index, *The Journal of Finance* 48, 801–808.

Curtin, Richard T., 2000, Surveys of Consumers, Working paper, Survey Research Center at the University of Michigan date obtained via email.

DeLong, J.B., Andrei Shleifer, Lawrence H. Summers, and Robert J. Waldmann, 1990, Noise Trader Risk in Financial Markets, *Journal of Political Economy* 98, 703–738.

Dimson, Elroy, Stefan Nagel, and Garrett Quigley, 2004, Capturing the Value Premium in the U.K. 1955-2001, *Financial Analysts Journal* ?, forthcoming.

Doukas, John A., and Nikolaos T. Milonas, 2004, Investor Sentiment and the Closed-end Fund Puzzle: Out-of-sample Evidence, *European Financial Management* 10, 235–266.

Durell, Alan, 2001, Stock Market Expectations and Stock Market Returns, Working paper, Dartmouth College.

Lee, Charles M.C., Andrei Shleifer, and Richard H. Thaler, 1991, Investor Sentiment and the Closed-End Fund Puzzle, *The Journal of Finance* 46, 75–109.

Ross, Stephen A., 2002, A Neoclassical Look at Behavioral Finance; Closed End Funds, Working paper, MIT.

Spiegel, Matthew, 1997, Closed-End Fund Discounts in a Rational Agent Economy, Working paper, Haas School at the University of California at Berkeley.

Table 1. Variable Descriptions

Primary Sentiment Measures, CEFD Based

Variable	Mean	Sdv	Min	Q1	Median	Q3	Max	ρ	Range	#obs
bullish.cefd.ew	−0.086	0.075	−0.24	−0.14	−0.091	−0.04	0.14	0.96	1965.07 –2000.12	426
d.bullish.cefd.ew	−0.000	0.022	−0.09	−0.01	−0.000	0.01	0.08	−0.26	1965.08 –2000.12	425
bullish.cefd.vw	−0.090	0.072	−0.27	−0.14	−0.100	−0.04	0.13	0.95	1965.07 –2000.12	426
d.bullish.cefd.vw	0.000	0.024	−0.11	−0.01	−0.000	0.01	0.09	−0.19	1965.08 –2000.12	425

Primary Sentiment Measures, Survey Based

Variable	Mean	Sdv	Min	Q1	Median	Q3	Max	ρ	Range	#obs
bullish.mich	87.000	12	51.70	78.30	89.900	94.80	112.00	0.96	1965.01 –2004.03	471
d.bullish.mich	−0.013	3.3	−12.20	−1.70	−0.217	1.90	17.30	0.01	1965.02 –2004.03	470
bullish.cb	97.700	23	43.20	82.00	97.900	113.00	145.00	0.97	1967.02 –2004.02	384
d.bullish.cb	−0.014	5.8	−23.00	−3.22	−0.138	3.81	21.70	0.04	1977.05 –2004.02	322

Auxiliary Sentiment Measures, Survey Based

Variable	Mean	Sdv	Min	Q1	Median	Q3	Max	ρ	Range	#obs
bullish.gallup.all	0.349	0.29	−0.35	0.14	0.429	0.58	0.78	0.86	1996.10 –2002.12	57
d.bullish.gallup.all	−0.010	0.16	−0.31	−0.13	−0.009	0.10	0.41	−0.24	1996.11 –2002.12	47
bullish.gallup.wealthy	0.407	0.31	−0.33	0.17	0.512	0.66	0.89	0.80	1996.10 –2002.12	57
d.bullish.gallup.wealthy	−0.008	0.2	−0.48	−0.14	−0.029	0.11	0.52	−0.36	1996.11 –2002.12	47
bullish.gallup.poor	0.304	0.29	−0.36	0.06	0.336	0.55	0.76	0.88	1997.02 –2002.12	55
d.bullish.gallup.poor	−0.012	0.14	−0.31	−0.12	−0.022	0.09	0.33	−0.17	1999.03 –2002.12	46
bullish.shiller	72.400	10	47.20	65.40	75.600	80.60	87.50	0.69	1989.10 –2002.12	42
d.bullish.shiller	0.164	2.5	−6.32	−0.77	0.700	1.69	4.40	−0.16	2001.08 –2002.12	17

Rate of Return Measures

Variable	Mean	Sdv	Min	Q1	Median	Q3	Max	ρ	Range	#obs
smallstocks.retspread	0.009	0.071	−0.21	−0.03	−0.000	0.03	0.43	0.11	1965.01 –2003.12	468
retailstocks.retspread1	0.001	0.030	−0.09	−0.02	0.001	0.02	0.12	0.15	1980.03 –2003.11	285
retailstocks.retspread2	−0.001	0.049	−0.17	−0.03	−0.001	0.02	0.18	0.02	1980.03 –2003.11	285
retailstocks.retspread3	−0.026	0.054	−0.21	−0.06	−0.026	0.00	0.16	−0.07	1980.03 –2003.11	285
sp500.pctchg	0.006	0.044	−0.22	−0.02	0.008	0.04	0.16	0.01	1965.02 –2004.04	471

Closed-End Fund Startups

Variable	Mean	Sdv	Min	Q1	Median	Q3	Max	ρ	Range	#obs
cef.startups	1.930	2.8	0.00	0.00	1.000	3.00	17.00	0.62	1970.01 –2003.12	408
d.cef.startups	0.005	2.5	−13.00	−1.00	0.000	1.00	14.00	−0.52	1970.02 –2003.12	407

All data are monthly. Prefix d denotes monthly differences. cef are closed-end funds, cefd is the closed-end fund discount, mich is the Michigan consumer confidence index, cb is the Conference Board consumer confidence index, gallup is the UBS/Gallup poll of investors, retspread is the rate of return on a rebalancing zero-investment portfolio.

Table 2. Sentiment Measures Validations, Monthly Data

Correlation of d.bullish.cefd.vw (Value-Weighted CEFD Decreases)

	Full Sample			Pre-1985			Post-1985		
Variable	**Corr**	**T-stat**	**df**	**Corr**	**T-stat**	**df**	**Corr**	**T-stat**	**df**
d.bullish.cefd.ew	78%	25.75**	423	78%	18.78**	231	79%	18.06**	190
d.bullish.cb	−4%	−0.74	282	−13%	−1.28	90	−0%	−0.06	190
d.bullish.mich	1%	0.27	423	−1%	−0.08	231	3%	0.45	190
d.bullish.gallup.all	21%	0.99	21						
d.bullish.gallup.wealthy	3%	0.12	20						
d.bullish.gallup.poor	34%	1.63	20						

Correlation of d.bullish.cefd.ew (Equal-Weighted CEFD Decreases)

	Full Sample			Pre-1985			Post-1985		
Variable	**Corr**	**T-stat**	**df**	**Corr**	**T-stat**	**df**	**Corr**	**T-stat**	**df**
d.bullish.cb	−7%	−1.13	282	−10%	−0.91	90	−5%	−0.73	190
d.bullish.mich	6%	1.26	423	2%	0.37	231	11%	1.51	190
d.bullish.gallup.all	10%	0.45	21						
d.bullish.gallup.wealthy	−6%	−0.25	20						
d.bullish.gallup.poor	23%	1.04	20						

Correlation of d.bullish.mich (Michigan Consumer Confidence Increases)

	Full Sample			Pre-1985			Post-1985		
Variable	**Corr**	**T-stat**	**df**	**Corr**	**T-stat**	**df**	**Corr**	**T-stat**	**df**
d.bullish.cb	52%	10.95**	320	42%	4.37**	90	57%	10.35**	228
d.bullish.gallup.all	55%	4.45**	45						
d.bullish.gallup.wealthy	56%	4.43**	44						
d.bullish.gallup.poor	47%	3.52**	44						
d.bullish.shiller	26%	1.05	15						

Correlation of d.bullish.cb (Conference Board Consumer Confidence Increases)

	Full Sample			Pre-1985			Post-1985		
Variable	**Corr**	**T-stat**	**df**	**Corr**	**T-stat**	**df**	**Corr**	**T-stat**	**df**
d.bullish.gallup.all	38%	2.77**	45						
d.bullish.gallup.wealthy	35%	2.46*	44						
d.bullish.gallup.poor	36%	2.57*	44						
d.bullish.shiller	23%	0.90	15						

Description: d denotes the first difference. The theories suggest that d.bullish variables should be positive when investors become more optimistic. cefd is the closed-end fund discount based measure, ew denotes that it is equal-weighted, vw that it is value-weighted. cb refers to the Conference Board consumer sentiment index, mich to the Michigan consumer sentiment index. gallup is the UBS/Gallup poll of investors, wealthy refers to investors with more than $100,000 in wealth. shiller is Robert Shiller's investor sentiment index. (Its monthly data does not overlap with the CEFD data.)

Table 3. Small-Firm Return Spread

Data	$\overline{R^2}$	N	constant	d.bullish.mich	d.bullish.cefd.ew	sp500.pctchg
full sample	8%	421	0.007	0.004	0.688	−0.008
				0.182	0.213	−0.005
			2.18*	3.84**	4.54**	-0.10
pre1985	15%	229	0.013	0.005	1.043	0.250
				0.168	0.316	0.136
			2.70**	2.72**	5.21**	2.21*
post1985	5%	188	0.001	0.004	0.167	−0.214
				0.219	0.055	−0.157
			0.32	3.07**	0.74	-2.12*

Excluding January Observations

Data	$\overline{R^2}$	N	constant	d.bullish.mich	d.bullish.cefd.ew	sp500.pctchg
full sample	3%	386	−0.002	0.003	0.167	−0.039
				0.196	0.062	−0.030
			-0.78	3.88**	1.24	-0.59
pre1985	5%	210	0.002	0.004	0.359	0.127
				0.190	0.129	0.086
			0.51	2.80**	1.92	1.26
post1985	5%	172	−0.007	0.003	−0.017	−0.179
				0.213	−0.007	−0.163
			-1.82	2.87**	-0.09	-2.10*

Description: The dependent variable, smallstocks.retspread, is the monthly rate of return on the smallest decile of firms minus that of the largest decile of firms. d.bullish.mich is the change in the Michigan consumer sentiment index. d.bullish.cefd.ew is the decrease in the equal-weighted closed-end fund discount. sp500.pctchg is the percent change in the S&P500 index. The first row of each regression prints the plain OLS coefficient, the second row prints the standardized coefficient (both dependent and independent variables are normalized to a mean of 0 and a standard deviation of 1). The third row prints the t-statistic. One star (two stars) denote significance at the 5% (1%) level, *two-sided*.

Table 4. Retail-Stock Return Spread, Longs are 13(f) Filed Stocks

Data	$\overline{R^2}$	N	constant	d.bullish.mich	d.bullish.cefd.ew	sp500.pctchg
full sample	8%	246	0.002	0.001	−0.047	−0.191
				0.164	−0.030	−0.263
			1.22	2.66**	-0.48	-4.17**
pre1985	11%	54	0.000	0.002	0.080	−0.151
				0.363	0.067	−0.256
			0.01	2.81**	0.54	-1.99
post1985	7%	188	0.003	0.001	−0.072	−0.202
				0.114	−0.043	−0.265
			1.23	1.61	-0.58	-3.62**

Description: The dependent variable, retailstocks.retspread1, is the monthly return on firms with no 13F filings minus that of firms with monthly 13F filings. d.bullish.mich is the change in the Michigan consumer sentiment index. d.bullish.cefd.ew is the decrease in the equal-weighted closed-end fund discount. sp500.pctchg is the percent change in the S&P500 index. The first row of each regression prints the plain OLS coefficient, the second row prints the standardized coefficient (both dependent and independent variables are normalized to a mean of 0 and a standard deviation of 1). The third row prints the t-statistic. One star (two stars) denote significance at the 5% (1%) level, *two-sided*.

Table 5. Retail-Stock Return Spread, Longs are Top Decile of 13(f) Filed

Data	$\overline{R^2}$	N	constant	d.bullish.mich	d.bullish.cefd.ew	sp500.pctchg
full sample	13%	246	0.001	0.003	−0.019	−0.377
				0.232	−0.007	−0.325
			0.37	3.86**	-0.12	-5.29**
pre1985	14%	54	−0.002	0.004	0.015	−0.171
				0.435	0.008	−0.180
			-0.38	3.43**	0.06	-1.42
post1985	13%	188	0.002	0.003	0.031	−0.447
				0.170	0.012	−0.367
			0.61	2.50*	0.16	-5.18**

Description: The dependent variable, retailstocks.retspread2, is the monthly return on firms with no 13F filings, minus that of firms in the highest decile of 13F filers. d.bullish.mich is the change in the Michigan consumer sentiment index. d.bullish.cefd.ew is the decrease in the equal-weighted closed-end fund discount. sp500.pctchg is the percent change in the S&P500 index. The first row of each regression prints the plain OLS coefficient, the second row prints the standardized coefficient (both dependent and independent variables are normalized to a mean of 0 and a standard deviation of 1). The third row prints the t-statistic. One star (two stars) denote significance at the 5% (1%) level, *two-sided*.

Table 6. Retail *Low-Trading* Stock Spread

Data	$\overline{R^2}$	N	constant	d.bullish.mich	d.bullish.cefd.ew	sp500.pctchg
full sample	20%	246	0.013	0.004	0.164	−0.604
				0.233	0.054	−0.433
			3.60**	4.04**	0.93	-7.36**
pre1985	16%	54	0.006	0.005	0.153	−0.430
				0.379	0.061	−0.346
			0.86	3.03**	0.50	-2.76**
post1985	21%	188	0.015	0.003	0.237	−0.670
				0.185	0.074	−0.466
			3.62**	2.84**	1.10	-6.88**

Description: The dependent variable, retailstocks.retspread3, is the monthly return on firms with no 13F filings and within this category the lower half of dollar trading volume, minus that of firms in the two highest deciles of 13F filers and within these categories the upper halves of high trading volume. d.bullish.mich is the change in the Michigan consumer sentiment index. d.bullish.cefd.ew is the decrease in the equal-weighted closed-end fund discount. sp500.pctchg is the percent change in the S&P500 index. The first row of each regression prints the plain OLS coefficient, the second row prints the standardized coefficient (both dependent and independent variables are normalized to a mean of 0 and a standard deviation of 1). The third row prints the t-statistic. One star (two stars) denote significance at the 5% (1%) level, *two-sided*.

Table 7. Retail *Low-Trading* Stock Spread, Value-Weighted Portfolios

Data	$\overline{R^2}$	N	constant	d.bullish.mich	d.bullish.cefd.ew	sp500.pctchg
full sample	26%	246	−0.001	0.003	−0.140	−0.521
				0.225	−0.061	−0.490
			-0.39	4.09**	-1.09	-8.71**
pre1985	10%	54	0.004	0.002	−0.129	−0.422
				0.207	−0.055	−0.365
			0.56	1.60	-0.44	-2.82**
post1985	31%	188	−0.002	0.003	−0.146	−0.544
				0.224	−0.064	−0.529
			-0.82	3.69**	-1.02	-8.39**

Description: The dependent variable is the monthly return on firms with no 13F filings and within this category the lower half of dollar trading volume, minus that of firms in the two highest deciles of 13F filers and within these categories the upper halves of high trading volume. Each portfolio is value- weighted, unlike the previous table. d.bullish.mich is the change in the Michigan consumer sentiment index. d.bullish.cefd.ew is the decrease in the equal-weighted closed-end fund discount. sp500.pctchg is the percent change in the S&P500 index. The first row of each regression prints the plain OLS coefficient, the second row prints the standardized coefficient (both dependent and independent variables are normalized to a mean of 0 and a standard deviation of 1). The third row prints the t-statistic. One star (two stars) denote significance at the 5% (1%) level, *two-sided*.

Table 8. Retail Low-Trading Stock Spread, Size Controlled

Data	$\overline{R^2}$	N	constant	d.bullish.mich	d.bullish.cefd.ew	smallstocks.retspread	sp500.pctchg
full sample	35%	245	0.012	0.002	0.077	0.431	−0.511
				0.121	0.026	0.413	−0.366
			3.66**	2.26*	0.49	7.72**	-6.83**
pre1985	64%	53	0.002	0.001	−0.086	0.768	−0.269
				0.053	−0.034	0.754	−0.216
			0.41	0.58	-0.42	8.49**	-2.59*
post1985	31%	187	0.015	0.002	0.177	0.363	−0.592
				0.110	0.055	0.345	−0.412
			3.77**	1.77	0.88	5.57**	-6.47**

Description: The table differs from the previous table in that it includes one additional dependent variable, the excess rate of return on small firms (smallstocks.retspread). The dependent variable, retailstocks.retspread3, is the monthly return on firms with no 13F filings and within this category the lower half of dollar trading volume, minus that of firms in the two highest deciles of 13F filers and within these categories the upper halves of high trading volume. d.bullish.mich is the change in the Michigan consumer sentiment index. d.bullish.cefd.ew is the decrease in the equal-weighted closed-end fund discount. sp500.pctchg is the percent change in the S&P500 index. The first row of each regression prints the plain OLS coefficient, the second row prints the standardized coefficient (both dependent and independent variables are normalized to a mean of 0 and a standard deviation of 1). The third row prints the t-statistic. One star (two stars) denote significance at the 5% (1%) level, *two-sided*.

Table 9. Monthly Closed-End Domestic Fund Startups (IPOs)

Data	$\overline{R^2}$	N	constant	d.bullish.mich	d.bullish.cefd.ew	smallstocks.retspread	sp500.pctchg
level	-1%	367	1.660	−0.018	3.236	−0.921	−1.067
				−0.023	0.026	−0.025	−0.018
			12.06**	-0.43	0.48	-0.46	-0.34
differences	-0%	366	−0.032	−0.046	1.751	−0.333	3.648
				−0.071	0.017	−0.011	0.074
			-0.27	-1.31	0.31	-0.20	1.39

Description: The dependent variable is described in the first column, and is either the level of closed-end fund startup IPOs (cef.startups) or the the level of closed-end fund startup IPOs (d.cef.startups). d.bullish.mich is the change in the Michigan consumer sentiment index. d.bullish.cefd.ew is the decrease in the equal-weighted closed-end fund discount. sp500.pctchg is the percent change in the S&P500 index. The first row of each regression prints the plain OLS coefficient, the second row prints the standardized coefficient (both dependent and independent variables are normalized to a mean of 0 and a standard deviation of 1). The third row prints the t-statistic. One star (two stars) denote significance at the 5% (1%) level, *two-sided*.

Table 10. Annual Closed-end Domestic Fund Startups (IPOs)

Data	$\overline{R^2}$	N	constant	d12.bullish.cefd.ew	d12.bullish.mich	sp500.pctchg
level	-6%	28	1.352	4.882		−0.069
				0.118		−0.005
			2.90**	0.63		-0.03
level	7%	31	1.781		0.088	−3.911
					0.398	−0.284
			4.23**		2.04*	-1.46
level	3%	27	1.555	6.786	0.080	−2.891
				0.164	0.388	−0.204
			3.37**	0.90	1.85	-0.97
d12 differences	2%	26	−0.034	−0.923	0.073	−0.684
				−0.023	0.366	−0.050
			-0.07	-0.12	1.71	-0.23

Description: The dependent variable is described in the first column, and is either the level of closed-end fund startup IPOs (cef.startups) or the annual difference of closed-end fund startup IPOs (d12.cef.startups). d.bullish.mich is the change in the Michigan consumer sentiment index. d.bullish.cefd.ew is the decrease in the equal-weighted closed-end fund discount. sp500.pctchg is the percent change in the S&P500 index. The first row of each regression prints the plain OLS coefficient, the second row prints the standardized coefficient (both dependent and independent variables are normalized to a mean of 0 and a standard deviation of 1). The third row prints the t-statistic. One star (two stars) denote significance at the 5% (1%) level, *two-sided*.

Figure 1. Time-Series of Sentiment Measures

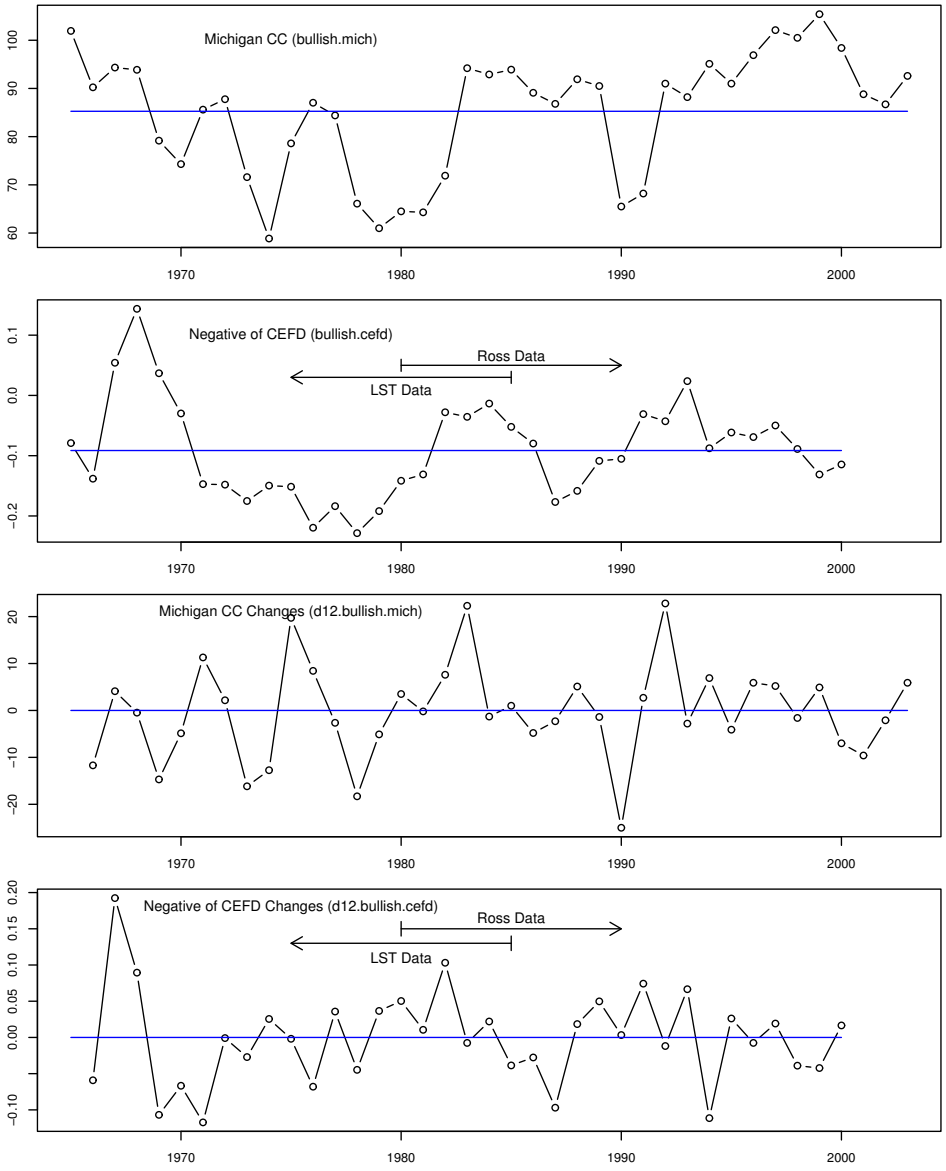


Figure 2. Time-Series of Stock Prices, Return Spreads, and CEF Startups

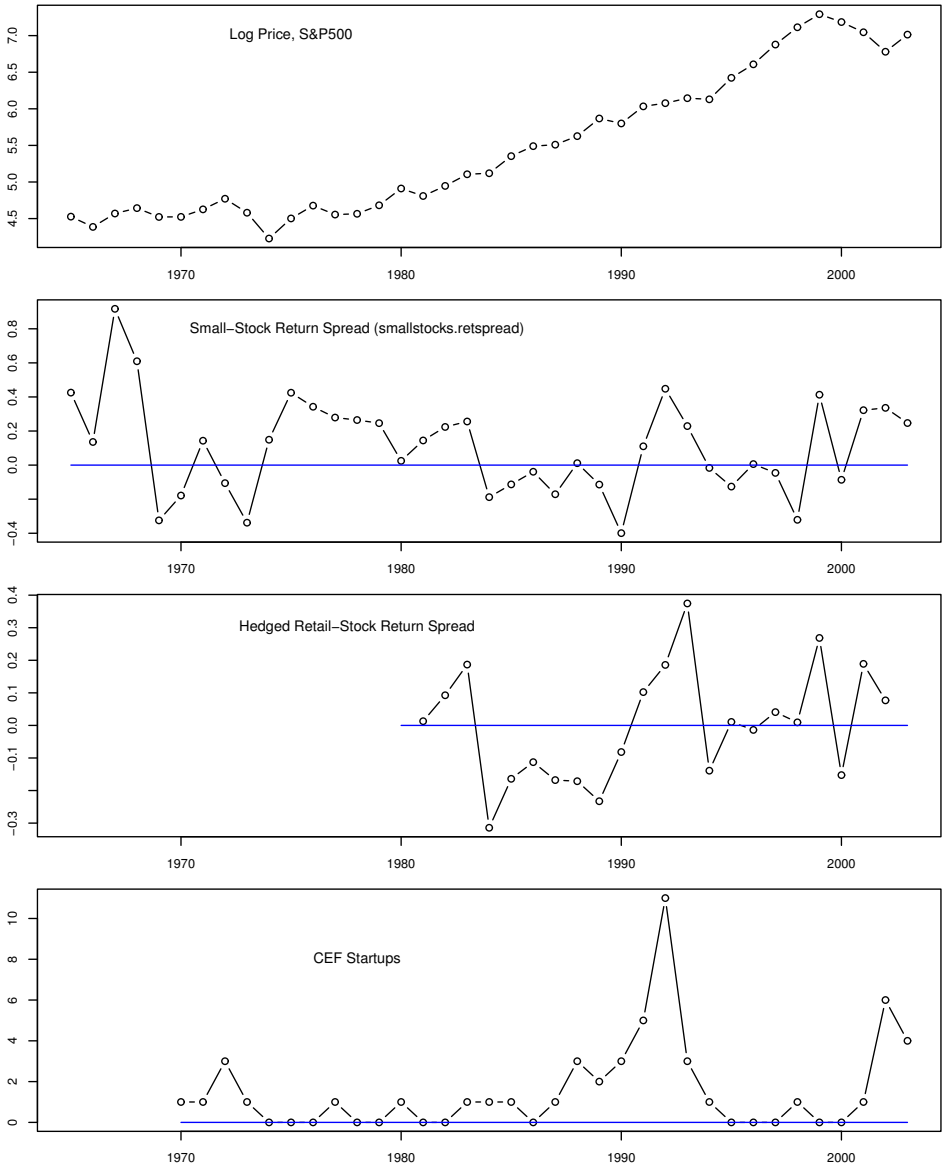
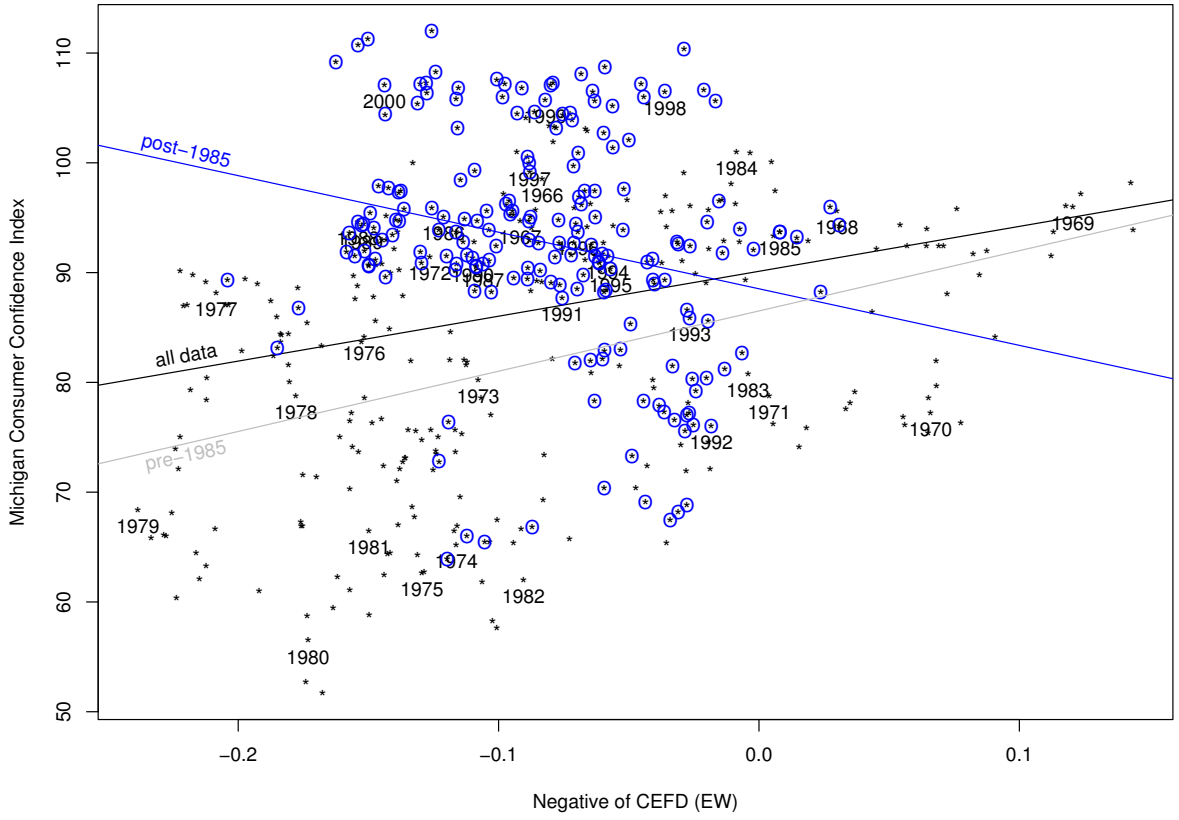


Figure 3. Michigan Consumer Confidence vs. Closed-End Fund Discount



Explanation: Circled points occur after 1985. The monthly series have high autocorrelation, so the plotted year indexes can give an idea of where the individual years cluster.

The blue downward sloping line is the regression line relating the two indexes to one another *after 1985*: a bullish CEFD has an inverse correlation with a bullish Michigan consumer confidence index. The two upward sloping lines are the overall relation and the relation before 1985, when a bullish CEFD and a bullish Michigan consumer confidence index associated positively.

The point of the figure is to show that even in levels, the relationship between the sentiment measures has changed over time. They are not "in-sync."