Expectations of Returns and Expected Returns

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We analyze time series of investor expectations of future stock market returns from six data sources between 1963 and 2011. The six measures of expectations are highly positively correlated with each other, as well as with past stock returns and with the level of the stock market. However, investor expectations are strongly negatively correlated with model-based expected returns. The evidence is not consistent with rational expectations representative investor models of returns. (*JEL* G02, G12, G14)

Over the last twenty years, increasing amounts of data on investor expectations of stock market returns have become available. We analyze these expectations obtained from six data sources: the Gallup investor survey, the Graham-Harvey Chief Financial Officer surveys, the American Association of Individual Investors survey, the Investor Intelligence survey of investment newsletters, Robert Shiller's investor survey, and the Survey Research Center at the University of Michigan. We also compare these investor expectations of returns with what financial economists call "expected returns" (hereafter ERs) computed from aggregate data on dividends, consumption, and market valuations. The measures of ERs we examine include the dividend price ratio but also variables proposed by Campbell and Cochrane (1999) and Lettau and Ludvigson (2001). These ERs measures seek to capture fluctuations in investors' required returns over time.

We begin with three findings about the expectations of returns. First, the six measures of expectations of stock market returns are highly positively correlated with each other. Second, these measures of investor expectations tend to be extrapolative: they are positively correlated with past stock market returns, as well as with the level of the stock market (i.e., they are positively

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correlated with the price-dividend ratio). Third, these measures of expectations are also highly correlated with investor inflows into mutual funds. Together, these results suggest that survey measures of investor expectations are not meaningless noise but are rather reflections of widely shared beliefs about future market returns, which tend to be extrapolative in nature.

We next compare these measures of investor expectations to four standard measures of ERs. Two findings stand out. First, although results differ across variables, generally speaking ERs and expectations of returns are negatively correlated with each other. When investors say that they expect stock market returns to be high, model-based expected returns are low. In rational expectations models, expectations of stock market returns and model-based measures of ERs should be perfectly positively correlated. We can reject this hypothesis with considerable confidence. This evidence is inconsistent with the view that expectations of stock market returns reflect the beliefs or requirements of a representative investor in a rational expectations model.

Second, both expectations of returns and ERs predict future stock market returns, but with opposite signs. When ERs are high, market returns are on average high; when expectations of returns are high, market returns are on average low.

Reconciling all the evidence poses a significant challenge. One possibility, pursued by all the authors constructing measures of ERs, is that investors hold rational expectations and ERs measure true, but not directly observed, expectations of market returns. But this possibility seems broadly inconsistent with the facts that the directly observed expectations of market returns (1) are highly correlated across data sources, (2) have a clear extrapolative structure, and (3) are negatively correlated with available measures of ERs. The expectations of investors captured by the surveys are not at all the expectations obtained indirectly from rational expectations models.

A second possibility is that when investors say "high," they mean "low." Perhaps when investors report high expectations of market returns, they mean high expected growth of fundamentals, in which case their true expectations of market returns are low. This conjecture seems inconsistent with the obvious fact that respondents in the surveys we cover are active investors, and even CFOs, and they are asked directly about their expectations of stock market returns, not changes in fundamentals. The conjecture is also inconsistent with the high correlation between investors' reported expectations and their actual behavior, as measured by the flows that retail investors direct into mutual funds.

The third possibility is that survey measures of expectations of returns capture actual expectations of a broad segment of investors and that these investors extrapolate returns and act on their beliefs. But in this case, what do the standard empirical measures of ERs reflect, if not these investors' expectations of market returns?

There is a small, but vibrant, literature using data on actual expectations to test economic hypotheses. For many economic quantities, such as employment

growth or inflation, survey data can be useful predictors of future activity. In some cases, market participants are better forecasters than are sophisticated statistical models (Ang, Bekaert, and Wei 2007; Aiolfi, Capistrán, and Timmermann 2011). When surveys turn to future asset prices or returns, however, investors extrapolate and do not predict well. Perhaps this is because prices, and thus returns, are equilibrium quantities.

Some early studies of investor expectations focused on exchange rates and found an extrapolative component in expectations data (Dominguez 1986; Frankel and Froot 1987, 1988). Robert Shiller and his coauthors have used expectations data to analyze bubbles in markets ranging from Japanese stocks (Shiller, Kon-Ya, and Tsutsui 1996) to American housing (Case, Shiller, and Thompson 2012). For equities, the papers closest to our work are those by Amronin and Sharpe (Forthcoming) and Bacchetta, Mertens, and Wincoop (2009), who find, as we also document below, that return expectations and expectational errors are related to dividend yields. Finally, several authors present evidence that investors' personal experiences influence their expectations, for example, Vissing-Jorgensen (2004), Malmendier and Nagel (2011), and Nagel (2012). Our contribution to the literature is to put several data sources together, to present data on the structure of investor expectations about stock market returns in a systematic way, and to compare these data with expected returns constructed by financial economists.

Theoretical papers in behavioral finance often recognize the role of extrapolation. Typically, these papers present models with representative agents who extrapolate fundamentals (Barberis, Shleifer, and Vishny 1998; Fuster, Laibson, and Mendel 2010; Hirshleifer and Yu 2012). These models are difficult—but not impossible—to reconcile with our evidence, because in these models when cash flows rise, extrapolators expect them to keep growing, but prices adjust so that they do not expect high returns. For example, in Barberis, Shleifer, and Vishny (1998), expected returns are constant. Our evidence is more likely to be consistent with an earlier class of behavioral models developed by Cutler, Poterba, and Summers (1990) and DeLong et al. (1990), in which one set of investors extrapolates past returns and one or more different classes of investors accommodate the trading initiated by extrapolative investors. Barberis et al. (2013) develop a more modern model of this kind, incorporating rational investors and extrapolators who have infinite horizons and consume over time. In their model, extrapolators trade based on return expectations that are negatively correlated with ERs.

The next section describes our data. Section 2 presents the basic statistical description of the data on expectations of returns. Section 3 compares investors' expectations of returns with the standard ERs measures. Section 4 describes who is on the other side of return-extrapolating investors. Section 5 offers some tentative conclusions on how the various pieces of evidence can be reconciled.

1. Measuring Investor Expectations

We collect survey results from six major sources: the Gallup investor survey, Graham and Harvey's surveys of CFOs, the American Association of Individual Investors survey, Investor Intelligence's summary of professional investors' beliefs, Shiller's survey on individual investors, and the University of Michigan survey of U.S. consumers. Below we describe each of the series individually. An Online Appendix lists the individual time series, except for Investor Intelligence, for which we purchased a license.

1.1 Gallup

The Gallup survey, conducted between 1996 and 2012, asks individual investors about their experiences in the economy and in the stock market, as well as their beliefs about the economy and the stock market over the next twelve months. Participants change from survey to survey. In the early sample years, the survey was run monthly with samples exceeding 700 respondents, but there are some gaps in later years, the largest being November 2009 through February 2011 when the survey was discontinued before being restarted in March 2011. The individual respondent data, also studied in Vissing-Jorgensen (2004), is available between 1996 and 2007. We use Gallup to construct our benchmark source of expectations because of Gallup's large sample size and consistent methodology.

Ideally, each monthly instance of the survey would have asked participants to specify the percentage return they expect to earn in the stock market. Instead, the survey asked participants whether they were "very optimistic," "optimistic," "neutral," "pessimistic," or "very pessimistic" about stock returns over the next year. Gallup sent us the percentage of participants in each group, which is available beginning in October 1996. In addition, more precise quantitative estimates of survey participants' beliefs are available between September 1998 and May 2003. During this time, participants were asked to give an estimate of the percentage return they expect on the market over the next twelve months. For an even shorter time period between 1998 and 2000, participants were also asked to indicate "the minimum acceptable rate of return" on their portfolio over the next twelve months.[1] The former can be used as a proxy for expectations, whereas the latter can be used as a measure of *required* returns, albeit for a short sample period.

Panel A of Figure 1 shows the Gallup investor expectations series. The solid line denotes our measure of expectations:

$$Gallup = \%Bullish - \%Bearish, \tag{1}$$

which is the percentage of investors who are "very optimistic" or "optimistic" about the future performance of the stock market, minus the percentage of

[1] We constructed this variable ourselves using the mean of participant-level survey responses.

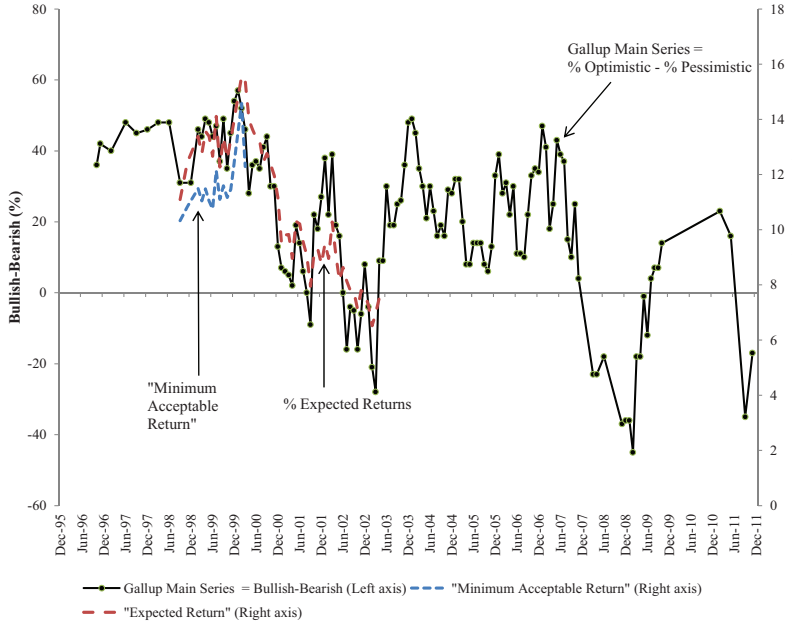

Figure 1
The Gallup survey
The main Gallup series is computed as the fraction of investors who are bullish (optimistic or very optimistic) minus the fraction of investors who are bearish. This figure also shows a short time-series when investors reported their "minimum acceptable return" and a slightly longer time-series of their percentage "expected returns." The latter two series are marked on the right axis.

investors who are "pessimistic" or "very pessimistic." The dashed line between 1996 and 2003 shows the average expectation of return on the stock market. These two series are 84% correlated in levels and 65% correlated in one-month changes, indicating that the qualitative measure of investor beliefs about market returns is capturing the same variation as the quantitative measure.

For additional comparison, the short dashed line between 1998 and 2000 shows investors reported "minimum acceptable returns," which closely track the two other series during the short window of overlap. On average, minimum acceptable returns are 1.74 percentage points lower than actual expectations of returns. The 87% correlation between minimum acceptable returns and expectations of returns suggests that investors actually understand the questions but also see expected returns and minimum required returns as driven by similar factors.

One can use the strong correlation between the time series to rescale *Gallup* from Equation (1) to estimate a corresponding percentage expectation of return. If we project *Gallup* on the percentage expected return, the fitted return values suggest that expectations of one-year returns vary between a low of 3.9% (February 2009) and a high of 14.27% (January 2000). An equal share of

investors reporting being "bullish" and "bearish" (i.e., *Gallup* = 0) corresponds to an expectation of 8.5%, close to the average one-year return of 8.1% on the CRSP value-weighted stock market during the period of 1997–2011.

1.2 Graham and Harvey

Since 1998, John Graham and Campbell Harvey have been surveying chief financial officers (CFOs) of major U.S. corporations. The survey solicits CFO views regarding the U.S. economy and the performance of their firms, as well as their expectations of returns on the U.S. stock market over the next twelve months.[2] Expectations of stock market returns are available beginning in October 2000. The survey contains answers from more than 200 respondents each quarter. Graham and Harvey publish summary statistics for each question on each survey.

We obtain average expected returns from these surveys from John Graham's web site and plot the resulting time series in Figure 2, alongside the Gallup series. CFO expectations are highly correlated with expectations reported in the Gallup survey, with a correlation coefficient of 0.77. Especially for CFOs, arguing that they do not know what is the market return is unreasonable.

1.3 American Association of Individual Investors

The American Association of Individual Investors Investor Sentiment Survey measures the percentage of individual investors who are bullish, neutral, or bearish on the stock market for the next six months. The survey is administered weekly to members of the American Association of Individual Investors. We construct a time series of investor expectations by subtracting the percentage of "bearish" investors from the percentage of "bullish" investors between 1987 when the survey first started and December 2011. Because most of our other data are available monthly, we work with monthly averages of this data. As shown in Panel A of Figure 3, the American Association expectations are strongly positively correlated with the Gallup time series.

1.4 Investors' Intelligence newsletter expectations

Since 1963, "Investors Intelligence," has been summarizing the outlook of over 120 independent financial market newsletters. Their survey was conducted monthly for 1963, then biweekly through June 1969 when it was shifted to weekly, at which frequency it remained through 2011. Data from this survey has been previously studied by Clarke and Statman (1998). The editors of the survey classify each newsletter as having "bullish," "bearish," or "neutral" forecasts of returns on the stock market over the near term. Because newsletters disappear and new ones are started, the editors of the survey watch the national

[2] In addition to asking CFOs for their "best guess" of the performance of the stock market, Graham and Harvey also ask for 90% confidence intervals. See Ben-David, Graham, and Harvey (2013) for further discussion.

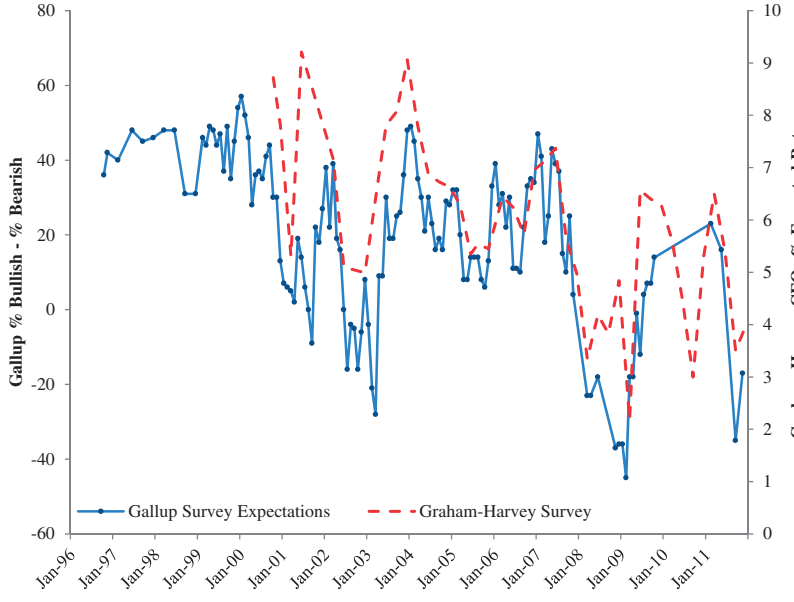

Figure 2
Comparing the Gallup survey with Graham-Harvey CFO expectations
The main Gallup series, marked with a solid line (left axis), is computed as the fraction of investors who are bullish (optimistic or very optimistic) minus the fraction of investors who are bearish. The dashed line denotes forecasts of nominal returns made by CFOs in John Graham and Campbell Harvey's quarterly surveys (right axis).

business press looking for references to new letters, but wait a few months after introduction before including any new source. Only four editors have been involved in classifying newsletters since inception of the survey in 1963, ensuring consistent treatment over time.[3]

In line with our methodology for the Gallup and American Association series, we summarize their measure as the difference between the percentage of newsletters that are "bullish" and the percentage that are "bearish." We obtain the time series of their expectations measure, which we plot alongside the Gallup series in Panel B of Figure 3. For months in which the survey was conducted multiple times, we use the average.

The Investors' Intelligence series exhibits more short-term volatility than our other measures of investor expectations. Nevertheless, the correlation with the other series is high: 60% with Gallup, 55% with American Association, and 64% with CFO expectations.

[3] There are relatively few studies analyzing the structure of newsletter expectations or their performance in forecasting the equity premium. Graham and Harvey (1996) analyze the newsletters covered by the Hulbert Financial Digest.

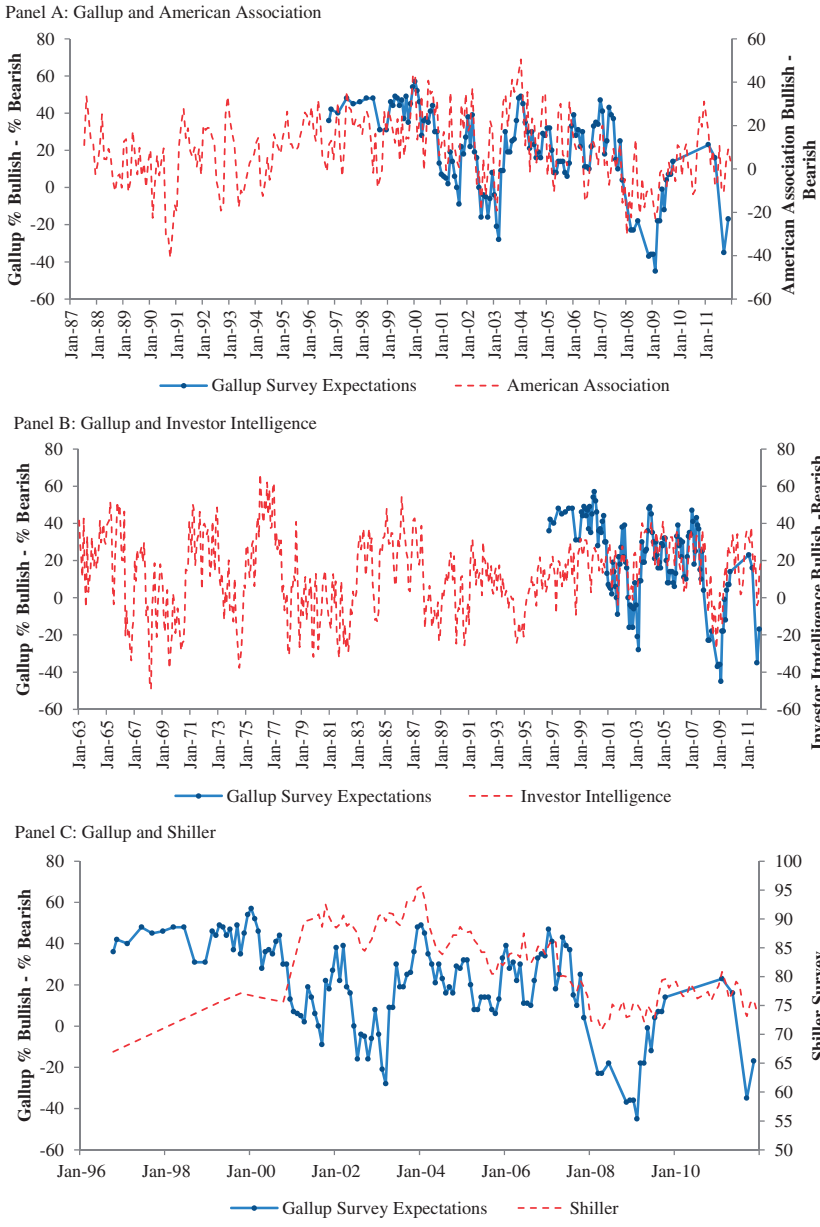

Figure 3
Comparing the Gallup survey with American Association, Investor Intelligence, Shiller, and the Michigan surveys
In each panel, the solid line shows the Gallup survey (left axis) and the dashed line shows the other survey.

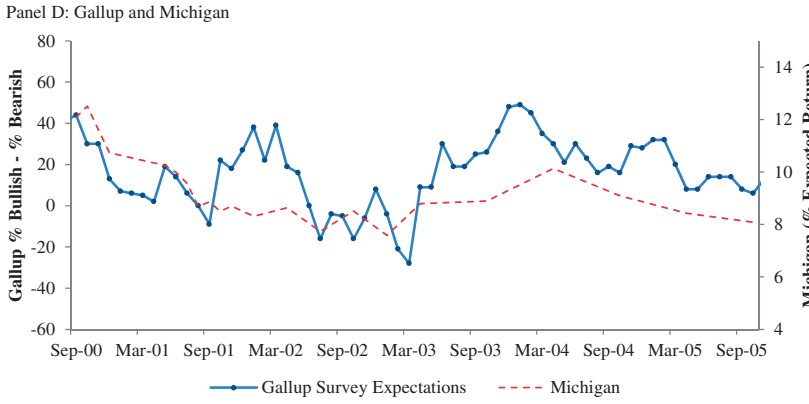

Figure 3
Continued

1.5 Shiller's survey

Started by Robert Shiller in the 1980s, the Investor Behavior Project at Yale University releases surveys of individual investor confidence in the stock market. We use the one-year individual confidence index, measured as the percentage of individual investors who expect the market to rise over the following year.[4] Data are available only sporadically between 1999 and July 2001. After that, the surveys are conducted monthly. As Figure 3 shows, Shiller is 39% correlated with the Gallup survey.

1.6 Michigan survey

Survey Research Center at the University of Michigan has been surveying U.S. consumers since 1946 about their experiences and beliefs regarding the economy and their consumption habits. For twenty-two of the surveys, occurring between November 2000 and October 2005, respondents were asked about their beliefs about expected returns on the broader stock market. For a subset of these surveys, respondents are asked about twelve-month returns, but for all twenty-two they are asked about their beliefs regarding annualized expected returns over the next two to three years. Respondents are occasionally polled more than once but never more than twice. Because time series on individuals consist of at most two data points, we restrict our attention to the survey averages. Amronin and Sharpe (Forthcoming) also rely on the Michigan data.

The Survey Research Center provided us the raw survey data from these surveys, and we compute average expected returns for each survey date. As

[4] See http://icf.som.yale.edu/stock-market-confidence-indices-explanation.

Figure 3 shows, Michigan expectations are 61% correlated with expectations from the Gallup survey. Because of the limited number of time-series observations (there are only 22 data points), we interpret results using this series with more caution.

1.7 Rescaling investor expectations

To keep things simple, for most of our statistical tests we use the unadjusted raw time series of investor expectations described above. But for the Graham-Harvey and Michigan surveys, the expectations are all in different units, making direct comparisons between them difficult, as well as making it difficult to assert the economic significance of their predictive power for stock returns. For this reason, we create rescaled versions of each expectations measure, which we denote by an asterisk (e.g., Gallup*). We do this by projecting the Gallup % stock return expectation (available between 1999 and 2003) onto each series.[5] We then use the fitted regression coefficients to rescale each series. This has the effect of simply multiplying by a constant and adding a (different) constant.

Panel B of Table 1 summarizes the rescaled series. Note that Graham-Harvey and Michigan do not change at all because they are already in units of annual percent return. Panel B shows that the average expected return, now including all series, ranges from 6.0% per annum (Graham-Harvey) to 10.6% per annum (Shiller). In comparing surveys, we must bear in mind that all of the series cover different time periods. The standard deviation of expected stock returns is similar across all measures, ranging from 1.3% (American Association) to 2.3% (Gallup).

A more subtle measurement issue comes into play for three of our six time series—Gallup, AA, and II. In these surveys, investors are asked whether they expect the stock market to "go up," "go down," or remain about the same. For each of these surveys we have used the standard "balance statistic" of percentage up minus percentage down as a summary measure of investor expectations. Nardo (2003) and Pesaran and Weale (2006) survey common techniques for generating average expectations from categorical survey data: the two most common include Carlson and Parkin's (1975) method and Pesaran's (1984) regression method. Nardo (2003) suggests that Carlson-Parkin is the more appropriate method when dealing with forecasts that are out of the control of the individual respondents.

The main idea underlying Carlson and Parkin's method is that if survey respondents draw their assessments from the same underlying distribution of beliefs Ω, then the expected probability that a survey variable y declines

[5] We have also experimented with projecting the Graham-Harvey expectations series onto each series. This relies on slightly fewer data points and produces expectations of returns that are slightly higher. We could also rescale using Michigan data.

Table 1
Summary statistics

Variable	Date range	N	Mean	Median	SD	Min	Max	ρ
Panel A: Raw measures of investor expectations								
Gallup: Main series	1996–2011	135	48.50	50.00	11.10	20.00	68.00	0.66
% expected return	1998–2003	51	10.63	10.21	2.47	6.52	15.56	0.86
% min acceptable return	1998–2000	14	11.52	11.32	1.02	10.33	14.57	0.14
Graham-Harvey	2000–2011	42	5.95	5.98	1.62	2.18	9.21	0.49
American Association	1987–2011	294	8.54	9.25	15.67	−41.00	50.47	0.63
Investor Intelligence	1963–2011	588	12.63	14.55	19.89	−49.20	66.64	0.80
Shiller	1996–2011	132	82.03	82.17	6.42	66.99	95.62	0.87
Michigan	2000–2005	22	9.34	8.83	1.37	7.58	12.51	0.53
Expectations Index (standardized units)	1986–2011	294	0.00	0.15	1.00	−2.87	2.26	0.76
Panel B: Rescaled measures of investor expectations								
Gallup*	1996–2011	135	10.49	10.73	2.27	3.94	14.27	0.66
Graham-Harvey*	2000–2011	42	5.95	5.98	1.62	2.18	9.21	0.49
American Association*	1987–2011	294	10.23	10.29	1.28	6.19	13.66	0.63
Investor Intelligence* Shiller*	1963–2011	588	10.18	10.38	2.09	3.68	15.85	0.80
Shiller*	1996–2011	132	10.56	10.52	1.94	6.46	15.11	0.87
Michigan*	1996–2011	22	9.35	8.83	1.37	7.58	12.51	0.53
Expectations Index*	1986–2011	294	10.19	10.51	2.10	4.19	14.94	294
Panel C: Other variables								
Flows into equity funds	1984–2011	336	0.19	0.19	0.28	−0.90	1.00	0.66
Log(SP500)	1963–2011	588	6.55	6.46	0.54	5.57	7.60	0.99
$R_{t\text{-}12}$	1963–2011	588	0.11	0.13	0.17	−0.42	0.61	0.92
Log(D/P)	1963–2011	588	−3.60	−3.52	0.41	−4.59	−2.86	0.98
Cay	1963–2011	588	0.00	0.00	0.02	−0.04	0.04	0.97
Composite *ER*	1963–2011	588	0.06	0.07	0.07	−0.15	0.23	0.96
Surplus consumption	1963–2011	588	0.15	0.17	0.06	−0.09	0.23	0.97
rx_{t+12}	1963–2010	576	0.06	0.08	0.17	−0.47	0.53	0.92
rx_{t+36}	1963–2008	552	0.18	0.15	0.34	−0.51	1.19	0.96
Earnings growth (%)	1963–2011	588	0.02	0.05	0.38	−2.17	2.17	0.98
Unemployment (%)	1963–2011	588	6.04	5.70	1.61	3.40	10.80	0.99
NIPOs	1960–2011	612	26.25	19	23	0	122	0.86
Issuance (% of market cap)	1972–2011	479	0.10	0.09	0.06	0.00	0.58	0.49

Mean, median, standard deviation, extreme values, and the monthly autocorrelations. Gallup, American Association, and Investor Intelligence are all index values based on whether polled survey respondents claim to be optimistic or pessimistic. Graham-Harvey and Michigan are measures of the percentage expected return, and Shiller measures the fraction of surveyed investors who report positive expected returns. For Graham-Harvey, the autocorrelation is quarterly. Panel A shows measures of investor expectations. The Expectations index is based on the first principal component of the Gallup, American Association, and Investor Intelligence surveys. Panel B rescales the qualitative measures of investor expectations so that they can be interpreted as a percentage nominal stock return. Panel C summarizes other variables, including percentage flows into equity mutual funds, the log of the inflation adjusted S&P 500 index value, past nominal stock returns, the log dividend-price ratio, Lettau and Ludvigson's (2001) consumption-wealth ratio, a composite predictor of stock market returns based on the log dividend price ratio and other factors, surplus consumption according to Campbell and Cochrane, future 12- and 36-month excess log stock returns, aggregate stock market earnings growth, the unemployment rate, and the monthly number of IPOs.

more than threshold a is given by $prob\{y_t \leqslant a_t|\Omega_{t-1}\} = EDO_t$, where EDO is the percentage of respondents who report their belief that the market will go down, and symmetrically for the expected probability that a survey variable increases beyond a threshold b. Based on this idea, Carlson and Parkin define a measure of expectations based on a transformation of the underlying categorical series. Although the transformation is straightforward,

there remains the question of how the resulting series should be rescaled into meaningful units.[6]

As a robustness check, we have transformed the Gallup, AA, and II series using Carlson and Parkin's method and find that it has almost no impact on the time series. In the case of Gallup, the transformed data series has a correlation of 99% with our simpler measure; in the case of AA, the correlation is 99.7%. The transformed II series is 83% correlated with the II series we use in this paper.[7] Because of this, we present results using our simpler measures.

1.8 Critiques of survey data

Two common criticisms of survey data on expected returns are that (1) they are noisy and thus meaningless and (2) people do not mean what they say or, relatedly, that survey responses are strongly dependent on framing and language. With regard to the first point, we have noted that although there is some noise in the individual surveys, responses of return expectations tend to be highly correlated with each other.

The second point is that financial economists are generally skeptical about survey data. Lamont (2003) submits, for example, that "survey data about expectations and beliefs is the weakest forms of data, just one rung up in the quality ladder above anecdotes." Cochrane (2011) maintains that "survey reports of people's expectations are certainly unsettling. However, surveys are sensitive to language and interpretation."

A simple consistency check for survey expectations data is to ask whether investors behave in a manner that is consistent with what they report in the surveys. This can be done by examining mutual fund flows. We obtain a measure of investor inflows into equity-oriented mutual funds from the Investment Company Institute. We scale the net dollar inflows in each month by the aggregate capitalization of the U.S. stock market. Although flows do not directly measure expectations, Figure 4 shows that they are strongly positively correlated with investor expectations. In addition, consistent with prior evidence, aggregate flows are strongly influenced by past returns (Lamont 2012). The evidence thus suggests that investors act in line with their reported expectations—when they report high expected market returns, they also tend to be purchasing equity mutual funds.

We also consider the objection that investors are confused by the questions. One possibility is that investors believe they are answering questions about current or future fundamentals rather than the performance of the stock

[6] A common practice, but one that would be potentially inappropriate here, is to impose that the time series of survey expectations is correct on average and to rescale the series accordingly.

[7] The lower correlation here is driven by a few data points in the II series in which a very small percentage of survey respondents say that they believe the market will be "about the same" in the next twelve months. Because Carlson and Parkin's method assumes that responses come from a smooth distribution of expectations, this has the effect of dramatically increasing the volatility of imputed expectations during this time.

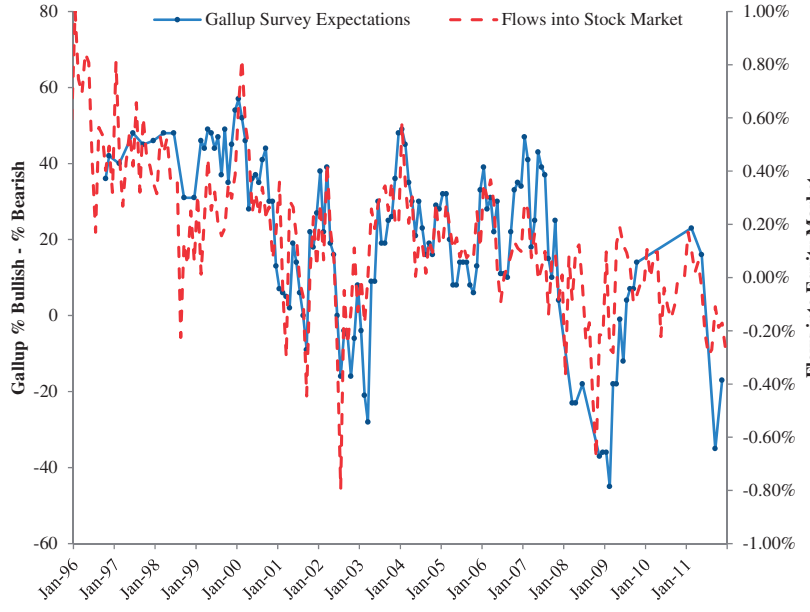

Figure 4
Comparing the Gallup survey with flows into equity mutual funds
The solid line denotes the percentage of investors who are bullish in the Gallup survey (left axis). The dashed line (right axis) is flows into mutual funds as a percentage of equity market capitalization, as reported by the Investment Company Institute.

market. Suppose, following Cochrane (2011), that investors report not their true beliefs but instead their "risk-neutral" equivalents, whereby they report their expectations of future discounted cash flows. Adopting this logic, when investors say "high expected return" they mean "high expected cash flow" and therefore "low required returns." But the survey questions we analyze here explicitly ask about future stock market returns. Gallup, for example, asks survey participants about their beliefs on the "performance" of the stock market over the next twelve months; the Michigan survey asks "what is the average annual percentage rate of return that you would expect to earn over the next 2 to 3 years?"; CFOs in the Graham-Harvey survey are asked "during the next year, I expect the S&P 500 return will be …" If investors were answering these questions using risk-neutral equivalents, it would mean that they would simply report the risk-free rate. In light of these observations, it is more plausible to conclude that investors understand the questions, and to take their answers at face value.

1.9 Correlation among different measures of investor expectations

In Table 2, we show partial correlations among the different measures of investor expectations. The table summarizes the visual impressions from Figures 1, 2, and 3. The average correlation is 43%, and the maximum

Table 2
Correlations between different measures of investor expectations

	Gallup (N = 135)	Graham-Harvey (N = 42)	American Association (N = 294)	Investor Intelligence (N = 588)	Shiller (N = 132)	Michigan (N = 22)	Index (N = 294)
Graham-Harvey	0.77						
	[0.000]						
American Association	0.64	0.56					
	[0.000]	[0.000]					
Investor Intelligence	0.60	0.64	0.55				
	[0.000]	[0.000]	[0.000]				
Shiller	0.39	0.66	0.51	0.43			
	[0.000]	[0.000]	[0.000]	[0.000]			
Michigan	0.61	−0.12	0.60	0.19	−0.55		
	[0.003]	[0.922]	[0.003]	[0.395]	[0.020]		
Expectations Index	0.87	0.58	0.87	0.81	0.52	0.55	
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.008]	
Fund flow	0.69	0.71	0.42	0.20	0.51	0.40	0.45
	[0.000]	[0.000]	[0.000]	[0.002]	[0.001]	[0.068]	[0.000]

This table shows partial correlation coefficients; that is, it uses the full sample of overlapping data for each series. The Expectations Index combines data in the Gallup, American Association, and Investor Intelligence series. Numbers in brackets denote *p*-values on the hypothesis that the correlation between the two series is zero.

correlation is 77% (between Gallup and Graham-Harvey). All correlations are positive, except for the correlation between Michigan and Graham Harvey (the correlation is zero) and between Michigan and Shiller (the correlation is significantly negative). The high degree of correlation between the time series is impressive given the variety of different investors being surveyed for their expectations—from individuals to chief financial officers to professional investors.

At the bottom row of the table, we show the correlations between investor expectations and flows. Again, the correlation is positive and statistically significant in nearly every case. The only exception is the Michigan survey, which is strongly positively correlated with Gallup and American Association but uncorrelated or negatively correlated with the other surveys. For this survey, we should bear in mind the limited number of observations (N = 22).[8]

The high degree of correlation between the different survey measures suggests that we can potentially isolate a common factor driving expectations across surveys. Extracting the common component is complicated by the differing time spans and periodicities of the underlying data. The three data series with the most overlap are Gallup, AA, and II, which overlap for 135 monthly realizations. For these series, the first principal component explains 74% of the variance. If we include the Graham and Harvey series as well, the first principal component explains 71% of the variance.[9]

Using the three series with the most time-series overlap (Gallup, II, and AA), we construct an investor expectations index using the first principal component

[8] For example, Michigan and Shiller overlap in only seventeen instances, with the first the negative correlation between the series entirely driven by the strong negative correlation over the first three data points.

[9] These two numbers are not directly comparable because the samples differ.

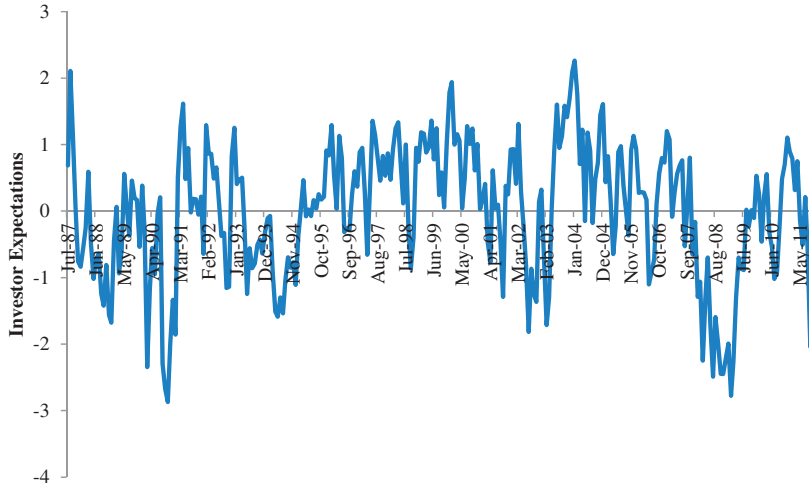

Figure 5
Investor Expectations Index
The index is based on the Gallup, American Association (AA), and Investor Intelligence (II) surveys and runs between July 1987 and December 2011. Prior to 1996, the index is based on the AA and II surveys.

of the three series. To deal with the missing months in the Gallup data, we carry forward past values of the survey, as this avoids the possibility of introducing any lookahead bias. For the period prior to the Gallup survey (1988–1995), we first project the principal component onto II and AA and use fitted values from this regression.

The scaling of the expectations index time series, which is based on principal component analysis, is meaningless. For this reason, we standardize it to a mean of zero and standard deviation of one over its 1987–2011 history. Complete details of index construction are described in the Internet Appendix. Our investor expectations index is between 0.52 (Shiller) and 0.87 (Gallup) correlated with the individual time series of expectations.

2. Determinants of Investor Expectations

Our next task is to describe the time-series structure of investor expectations. In this, we are guided by past research. Several empirical studies have stressed the role of extrapolative expectations in explaining behavior of security prices (e.g., Cutler, Poterba, and Summers 1991; Barsky and DeLong 1993; Lakonishok, Shleifer, and Vishny 1994). These studies guide our empirical analysis.

We start in Figure 6 by plotting the Gallup measure of investor expectations against past twelve-month returns on the U.S. stock market. There appears to be a high positive correlation between investor expectations and past returns.

Table 3 presents results for the corresponding time-series specifications:

$$Exp_t = a + bR_{t-12} + c\log(P_t/D_t) + dZ_t + u_t, \quad (2)$$

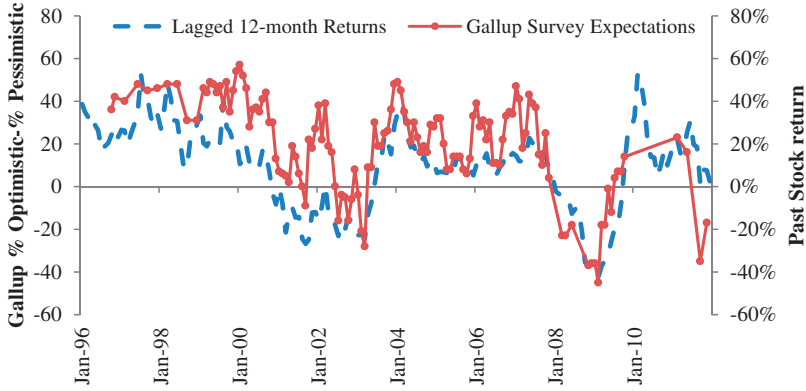

Figure 6
The role of past stock market returns in explaining survey expectations
The dashed line denotes the twelve-month rolling nominal return on the CRSP VW stock index. The solid line marked with circles denotes expectations from the Gallup survey (% optimistic – %pessimistic).

where R denotes the past k-period cumulative raw return on the stock market, P/D denotes the price-dividend ratio—a measure of the price-level—and Z denotes other variables. In the table, we show specifications in which R denotes the past twelve-month returns. Below we pursue the question of how the results depend on the horizon of return measurement.

In time-series regressions of this sort, both the left- and right-hand side variables are persistent, leading to positive autocorrelation of the error term u_t. The standard correction is to report t-statistics based on Newey and West (1987), allowing for a sufficient number of lags. In our case, this is somewhat complicated by the sporadic sampling of some of the time series. For example, the Graham-Harvey survey measures are released quarterly, whereas the Gallup data have short episodes of missing data. We follow Datta and Du (2012), who suggest a simple modification of Newey and West's procedure, in that the researcher treats the data as if they were equally spaced.[10]

Although the results differ across measures, Table 3 shows that investor expectations are well explained by two variables. First, when recent past returns are high, investors expect higher returns going forward. Second, even after controlling for recent returns, investor expectations of future returns are positively correlated with the price dividend ratio. These results appear regardless of how investor expectations are measured. Across the columns of Panel A of Table 3, the average R^2 is 0.33.

Because the survey expectations measures all have different units, the regression coefficients must be rescaled in order to compare them across

[10] A more minor issue is that while we treat the surveys as capturing investors' expectations at a point in time, in practice they are collected over a short period prior. This may introduce measurement error into the dependent variable, leading to attenuation bias.

Table 3
Determinants of investor expectations

	(1) Gallup	(2) GH	(3) AA	(4) II	(5) Shiller	(6) Michigan	(7) Index	(8) Gallup	(9) GH	(10) AA	(11) II	(12) Shiller	(13) Michigan	(14) Index
Panel A: Past returns and price levels														
R_{t-12}	91.227	3.133	32.479	50.771	1.626	3.897	3.092	89.155	3.354	36.173	53.454	3.368	6.868	3.347
	[8.811]	[2.515]	[4.046]	[6.012]	[0.182]	[1.680]	[5.516]	[13.052]	[2.460]	[5.839]	[7.031]	[0.691]	[5.050]	[7.600]
Log(P/D)								25.995	3.404	15.721	11.465	17.801	5.389	1.087
								[4.107]	[3.264]	[4.234]	[3.131]	[4.808]	[6.359]	[5.785]
Constant	14.881	5.789	5.018	6.915	81.965	9.614	−0.337	−92.859	−7.979	−56.461	−34.654	9.893	−13.535	−4.587
	[5.307]	[12.030]	[2.320]	[3.084]	[43.492]	[12.910]	[2.312]	[−3.523]	[−1.902]	[−3.847]	[−2.491]	[0.668]	[−3.858]	[−6.079]
N	135	42	294	588	132	22	294	135	42	294	588	132	22	294
R^2	0.611	0.133	0.135	0.188	0.002	0.191	0.300	0.689	0.348	0.259	0.243	0.317	0.827	0.443
Panel B: Including controls for fundamentals and the risk-free rate														
R_{t-12}								107.759	7.335	39.269	57.864	3.084	3.772	3.691
								[8.544]	[8.090]	[4.910]	[8.041]	[0.501]	[5.135]	[7.841]
Log(P/D)								27.995	4.358	10.77	6.605	16.725	3.978	0.909
								[2.663]	[3.601]	[1.999]	[1.401]	[3.125]	[7.222]	[3.220]
Earnings gr.	21.244	0.271	5.323	2.324	0.738	2.998	0.467	−12.482	−1.215	−1.644	−6.453	−0.631	1.580	−0.191
	[2.994]	[1.152]	[2.124]	[0.402]	[0.823]	[4.260]	[2.134]	[−1.786]	[−5.604]	[−0.726]	[−1.887]	[−0.584]	[5.068]	[−1.291]
Unemployment	1.346	−0.411	−3.652	1.834	−3.333	0.267	−0.218	−2.59	−0.047	−1.823	1.790	−2.354	−0.180	−0.065
	[0.380]	[−2.420]	[−3.158]	[1.616]	[−5.167]	[0.634]	[−2.692]	[−0.842]	[−0.303]	[−1.378]	[1.856]	[−3.592]	[−0.670]	[−0.773]
Risk-free rate	488.585	−8.496	−146.512	−201.5	−247.594	82.68	−6.518	−71.38	−8.081	−117.961	−187.116	−272.767	21.479	−5.094
	[1.925]	[−0.500]	[−1.529]	[−3.127]	[−2.800]	[3.854]	[−0.944]	[−0.550]	[−0.687]	[−1.123]	[−2.895]	[−3.844]	[−1.404]	[−0.785]
Constant	−1.358	8.740	35.792	12.264	108.737	5.462	1.528	−87.025	−11.485	−21.996	−18.314	35.338	−7.261	−3.337
	[−0.052]	[5.675]	[3.402]	[1.710]	[17.984]	[1.943]	[2.094]	[−1.577]	[−2.185]	[−0.730]	[−0.817]	[1.477]	[−4.604]	[−1.930]
N	135	42	294	588	132	22	294	135	42	294	588	132	22	294
R^2	0.403	0.190	0.119	0.103	0.372	0.803	0.136	0.718	0.509	0.271	0.321	0.523	0.929	0.453

Time-series regressions of survey expectations of future stock market returns on past stock market returns returns $R_{t\text{-}12}$, the log price-dividend ratio, and measures of fundamentals Z:

$$Exp_t = a + bR_{t-k} + c(P_t/D_t) + dZ_t + u_t.$$

Newey-West t-statistics with twelve-month lags are shown in brackets. GH, Graham-Harvey; AA, American Association; II, Investor Intelligence; Index, Expectations Index that combines data in the Gallup, American Association, and Investor Intelligence series. The regressions in Panel A include only past returns and the price-dividend ratio; in Panel B, measures of fundamentals (earnings growth, unemployment, and the risk-free rate) are included.

different survey types. Consider the regression in Column (8): the coefficient on lagged returns is 89.155, whereas the coefficient on the price dividend ratio is 25.995. An increase in the price level over the past year of 20% (roughly one standard deviation of annual returns over the period on which the regression is based) increases the Gallup measure of expectations by 20.5 units. Rescaling this to a percentage return, this is approximately 1.80 percentage points, about one standard deviation. Across all specifications, the coefficients on the price dividend ratio tend to be lower, but the same order of magnitude, than the coefficients on the twelve-month past return. Because the price level, in log terms, is essentially just the sum of all past returns, this simply says that more recent returns exert a stronger influence on investor expectations.

In addition to past returns and price dividend ratio, we experiment with several proxies for fundamentals, including past and current changes in log dividends, past and current changes in log earnings, and measures of macroeconomic conditions, such as current and lagged GDP growth, industrial production, and the unemployment rate. In further untabulated tests we have also attempted to use measures of log consumption and consumption growth because these are suggested by academic research as being related to ERs. None of these variables, it turns out, have much explanatory power for investor expectations. Although these variables sometimes have statistically significant univariate correlations with investor expectations, they are nearly always eliminated when we control for past returns and the price level. In Panel B we show representative results, in which we include twelve-month earnings growth, the unemployment rate, and the risk-free interest rate. Only in the case of earnings growth do any of these variables consistently play any role in explaining investor return expectations. When we include the price level and the past stock market return, these variables again become insignificant.

These results raise the question of whether expectations depend more on recent return realization or on more distant ones. To investigate this, we estimate nonlinear least squares regressions of the form

$$Exp_t = a + b \cdot \sum_{j=0}^{k} w_j R_{t-j} + u_t, \tag{3}$$

where $w_j = \frac{\lambda^j}{\sum_{i=0}^{k} \lambda^i}$.

In Equation (3), the weight on past return realization R_{t-k} is w_k, and the sum of all past weights is equal to one. The coefficient λ measures how quickly past return realizations die out in investors' memory. For example, for $\lambda = 0.80$, the return in period t receives approximately double the weight as the return in period t-4 ($1/0.80^4 = 2.44$). To allow for variation in weights on returns within years, we use quarterly stock market returns. Results are shown for each of our expectations measures in Table 4.

Across the specifications in Table 4, λ ranges from 0.33 to 0.92. The average is 0.56. This means that returns four quarters earlier (from months t-15 to the

Table 4
Determinants of investor expectations

	(1) Gallup	(2) GH	(3) AA	(4) II	(5) Shiller	(6) Michigan	(7) Index
λ	0.770	0.457	0.392	0.493	0.334	0.918	0.542
	[19.946]	[2.617]	[3.968]	[4.950]	[0.384]	[42.126]	[2.274]
a	11.725	5.781	5.206	6.530	81.912	8.693	−0.359
	[4.464]	[2.425]	[2.256]	[2.780]	[43.906]	[25.511]	[5.119]
b	502.643	14.690	133.816	227.675	12.270	65.140	14.142
	[8.563]	[23.839]	[2.349]	[5.819]	[0.234]	[5.542]	[5.107]
N	135	42	294	588	132	22	294
R^2	0.675	0.252	0.219	0.281	0.015	0.768	0.415

Nonlinear least squares time-series regressions of survey expectations of stock market returns for the next year on the weighted sum of past stock market returns:

$$Exp_t = a + b \cdot \sum_{j=0}^{k} w_j R_{t-j} + u_t,$$

where $w_j = \frac{\lambda^j}{\sum_{i=0}^{k} \lambda^i}$.

The weights on past returns sum to one, with higher λ indicating more weight on recent data. We use quarterly stock market returns. Newey-West t-statistics with twelve-month lags are shown in brackets. GH, Graham-Harvey; AA, American Association; II, Investor Intelligence.

end of month t-12) are only 10% as important as returns in the past quarter. We also estimate Equation (3) using fund flows as the dependent variable. This yields a λ of 0.65. In other words, as reflected in both reported surveys and in investor behavior, expectations appear to depend strongly on market returns experienced most recently.[11]

The results in Tables 3 and 4 are broadly consistent with a great deal of evidence that has accumulated in finance over the last 25 years. A substantial share of investors, including individuals, CFOs, and professional investors hold extrapolative expectations about returns. When stock prices are high, and when they have been rising, investors are optimistic about future market returns. These results decisively reject the view that survey measures of investor expectations are meaningless noise: this is both because of the high correlations of expectations across data sources and because of the highly predictable structure of expectations. In the remainder of the paper, we compare our measures of expectations with measures of ERs derived from consumption-based models and seek to provide a consistent account of the evidence.

3. How Expectations of Returns and ERs Predict Future Returns

Ever since Robert Shiller's (1981) path-breaking work on excess volatility of stock prices under the assumption of constant expected returns, financial economists have sought to reconcile stock market volatility with efficient

[11] These results can be contrasted with Malmendier and Nagel (2011) who find that *distant* but salient past history plays a role in investor market participation decisions.

markets theory. The leading approach has been to construct theoretical models in which required returns are variable in a way that explains the volatility of market prices and to evaluate empirical measures of ER suggested by these models. We study three measures of expected returns suggested by this research: the dividend price ratio, surplus consumption from Campbell and Cochrane (1999), and the consumption wealth ratio from Lettau and Ludvigson (2001).[12]

The starting point of this research is the behavior of the log price dividend ratio. As first pointed out by Campbell and Shiller (1988), Cochrane (1992), and Campbell and Ammer (1993) and recently summarized by Cochrane (2011), most of the variation in price dividend ratios describes variation in expected future returns rather than future dividend growth. In other words, in the decomposition of the log dividend price ratio dp,

$$\text{var}(dp_t) \approx \text{cov}\left[dp_t, \sum_{j=1}^{k} \rho^{j-1} r_{t+j}\right] - \text{cov}\left[dp_t, \sum_{j=1}^{k} \rho^{j-1} \Delta d_{t+j}\right] - \rho^k \text{cov}(dp_t, dp_{t+k}), \quad (4)$$

all of the variation in dividend-price ratios is explained by the first term. This is because, as shown by Cochrane (2008), the dividend-price ratio does not forecast changes in future dividend growth Δd. Campbell and Shiller (1988) show that there is little evidence that changes in the dividend-price ratio are associated with changes in observable risk. Equation (4) is essentially an accounting identity from the viewpoint of the econometrician. In a representative agent rational expectations models, however, time-series variation in expected returns in (4) must be the same as time-series variation in expectations of returns.

To explain variation in the expected returns implied by changes in the dividend price ratio, researchers have put forth rational expectations models in which investors' required market returns fluctuate enough to match the data. These models come in three broad flavors: habit formation models in the spirit of Campbell and Cochrane (1999) that focus on the variation in investor risk aversion, long-run risk models in the spirit of Bansal and Yaron (2004) in which investors' perception of the quantity of long-run risk drives variation in discount rates, and so-called rare disaster models that capture time-varying estimates of disaster probability (Barro 2006; Berkman, Jacobsen, and Lee 2011; Wachter 2013). Taking the dividend-price ratio as a proxy for ER, these models are often calibrated so as to match the time-series variation in this ratio.

[12] We have also studied, but do not report here, a measure of ER derived from the Bansal and Yaron (2004) long-run risks model. Dana Kiku kindly provided us with a measure of expected returns from Bansal, Kiku, and Yaron (2012). Time-series variation in their measure is closely related to the dividend yield (and thus negatively correlated with most measures of survey expectations), and so we do not lose much by focusing on the dividend yield instead. We exclude this material from the paper because, although we obtain similar results as for the dividend price ratio, the data are only available annually.

We pay particular attention to the Campbell and Cochrane habit formation model, in part because of its prominence in the literature and in part because this model suggests an empirically implementable proxy for ERs. In Campbell and Cochrane, investor utility is defined relative to "habit," which is essentially a moving average of past consumption. When past consumption has been high, risk aversion falls and prices are high. As shown in Cochrane (2011), the surplus consumption ratio, computed using aggregate data on nondurable consumption, closely matches time-series variation in the price dividend ratio in recent decades.

We also study the consumption wealth ratio of Lettau and Ludvigson (2001), best understood as reflecting consumption behavior under the permanent income hypothesis with time-series variation in required returns (where this variation may come from habit formation models or elsewhere). If prices are high because required returns are low (rather than dividend growth being high), then consumption will rise only modestly under the permanent income hypothesis and the consumption-wealth ratio must be low. In an endowment economy, the role of consumption is analogous to that of dividends. According to Lettau and Ludvigson, "when the consumption aggregate wealth ratio is high, agents must be expecting either high returns on the market portfolio in the future or low consumption growth rates. Thus, consumption may be thought as the dividend paid from aggregate wealth." Lettau and Ludvigson do not take a position on what drives the underlying variation in expected returns, only that whatever the driver, consumers understand the variation and adjust their consumption accordingly.[13]

Panel C of Table 1 summarizes the ERs measures. We compute the log dividend yield based on CRSP value-weighted returns. Surplus consumption is computed following Campbell and Cochrane (1999) and using code provided on Cochrane's web site. We obtain *cay* from Lettau's web site.

3.1 Correlations between expectations of returns and ERs

If expectations of returns are measured without noise, then models of ERs predict a perfect positive correlation between investor expectations and ERs. If expectations and ERs are measured in the same units, the regression coefficient in a regression of expectations on ERs should be exactly one.[14]

Table 5 shows the pairwise correlation between each measure of expectations of returns and ERs. The various survey measures of expectations are available for different periods of time and at different frequencies, so the number of observations used to estimate each correlation varies.

[13] Other authors have questioned whether this assumption is reasonable. See, for example, Brennan and Xia (2005).

[14] If ER and expectations are in the same units then a regression of $\text{Expectations}_t = a + bER_t + u_t$ should yield coefficients $a = 0$, $b = 1$, and an R^2 of one. We do not test this hypothesis here directly, because neither expectations nor ERs are directly in units of expected one-year stock returns.

Table 5
Relationship between model expected returns and survey expected returns

	Survey expectation						
	Gallup N = 135	Graham-Harvey N = 42	AA N = 294	II N = 588	Shiller N = 132	Michigan N = 22	Index N = 294
Log(D/P)	−0.328	−0.443	−0.305	−0.193	−0.554	−0.567	−0.312
[*p*-val]	[0.000]	[0.003]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
-Surplus C	−0.481	−0.529	−0.283	−0.054	−0.670	−0.736	−0.298
[*p*-val]	[0.000]	[0.000]	[0.000]	[0.191]	[0.000]	[0.000]	[0.000]
cay	0.025	0.139	−0.016	−0.185	0.366	−0.003	−0.133
[*p*-val]	[0.776]	[0.380]	[0.788]	[0.000]	[0.000]	[0.988]	[0.023]
Composite ER	−0.572	−0.443	−0.300	0.125	−0.349	−0.8074	−0.361
[*p*-val]	[0.000]	[0.003]	[0.000]	[0.003]	[0.000]	[0.000]	[0.000]

The table shows pairwise correlations between measures of investor expectations and measures of expected returns. Expected returns measures include the log dividend price ratio, surplus consumption, consumption-wealth ratio *cay*, and a composite measure of expected returns based on a multivariate regression of excess stock market returns over the next year on the log dividend price ratio, the Treasury-bill rate, the default spread, and the term spread. *p*-values and the number of observations are shown directly below each estimate. We use only data in which both measures are reported, and we do not interpolate missing values. AA, American Association; II, Investor Intelligence.

The time-series correlation between Gallup expectations and Log(D/P) is −0.33 (*p*-value = 0.00). As suggested by the regressions in Table 2, Gallup expectations are even more strongly negatively correlated with twelve-month changes in Log(D/P) (not tabulated)—the correlation is −0.57, reflecting the role of recent returns in shaping expectations.

The second set of rows in Table 5 shows that expectations are even more strongly negatively correlated with minus the surplus consumption ratio (−0.48 correlation with Gallup and −0.53 with Graham-Harvey). The correlations between expectations of returns and the consumption wealth ratio, *cay*, are more mixed, as can be seen in the bottom line of the table. Gallup, Graham-Harvey, and Michigan expectations are uncorrelated with *cay*. Shiller expectations are positively correlated with *cay*, whereas American Institute and Investors' Intelligence expectations are negatively correlated with *cay*. Keep in mind that the null hypothesis is that expectations are perfectly *positively* correlated with ERs.[15] In addition, it turns out that the level of expectations is strongly negatively correlated with twelve-month changes in *cay*.

The bottom row in Table 5 shows the correlation of expectations with a composite measure of expected returns. Following common practice in asset pricing (e.g., Fama and French 1989), we estimate a regression of one-year ahead excess returns on the log dividend price ratio, the Treasury-bill yield, the default spread (the yield on BAA minus the yield on AAA-rated bonds) and the term spread (the yield difference between ten-year government bonds and the three-month Treasury bill). Our composite measure of ERs is based on

[15] Although there is not much correlation if both *cay* and expectations are measured in levels, the correlation is strongly negative when we examine the correlation between expectations and twelve-month *changes* in *cay* (not tabulated).

fitted values from this regression. For all but one of our measures of survey expectations, there is a strong and significant negative correlation between expectations measured and ERs.

The evidence in this subsection raises a puzzle. We have argued in earlier sections—based on the consistency of survey expectations across surveys, their alignment with mutual fund flows, and their extrapolative structure—that survey measures of expectations in fact reflect the true beliefs of many investors about future returns. And theory suggests that survey expectations should be strongly positively correlated with ERs. To the extent that either expectations or true ERs are measured with noise, the correlation is biased toward zero. But we have now shown that these measures of expectations are if anything *negatively* correlated with measures of ERs used by financial economists. If surveys indeed measure expectations of broad classes of investors, then what is measured by these computations of expected returns, which after all are indirect?

3.2 Forecasting regressions

A critical property of ERs measures is that they actually forecast future returns, even if they lack explanatory power at short horizons.[16] In this subsection, we examine the relationship between expectations of returns, ERs, and realized stock returns.

Table 6 shows the results of time-series regressions of the form

$$R^x_{t+k} = a + bX_t + u_{t+k}, \tag{5}$$

where R^x_{t+k} denotes the k-month excess return, that is, cumulative return on the CRSP value-weighted stock market net of the k-period compounded risk-free rate, and X is a predictor variable.[17] We study the forecasting power for 12- and 36-month forward excess returns. We constrain the data to the 1963–2011 period, because this is the longest period for which our expectations data are available (the II series), although many of the regressions use shorter sample periods. t-statistics for k-period return regressions are based on Newey and West (1987), using k lags.

We begin with the null hypothesis: if reported expectations measure true expected returns and are measured in the same units as ER, then expectations should forecast future returns with a coefficient of one. That is, if $X_t = \mathrm{E}_t[R_{t+k}]$ then under the null hypothesis of rational expectations, the coefficient a in Equation (4) is 0 and $b=1$. Moreover, expectations should subsume all

[16] See Ferson, Sarkissian, and Simin (2003), Stambaugh (1999), Welch and Goyal (2008), Campbell and Yogo (2006), and Campbell and Thompson (2008) for a discussion of the time-series properties and performance of stock market return predictors.

[17] Technically, we think of the surveys as asking investors about expected nominal stock returns, although perhaps "optimistic" can be interpreted as optimistic *relative* to the risk-free rate. We have repeated the return tests using a risk-free rate control with virtually identical results (not presented).

Table 6
Forecasting future returns

Panel A: Forecasting twelve-month returns

Gallup*	−1.985										−0.615		−0.547		−1.996	
	[−1.370]										[−0.437]		[−0.304]		[−1.427]	
Graham-Harvey		−0.021														
		[−0.670]														
AA**			−1.655													
			[−0.892]													
II**				−1.534												
				[−2.323]												
Shiller*					−0.612											
					[−0.228]											
Michigan						−0.081										
						[−3.964]										
Index*							−1.617					−0.860		−0.914		−1.271
							[−1.530]					[−0.766]		[−0.816]		[−1.144]
Log(D/P)								0.072			0.397	0.139				
								[1.424]			[4.396]	[1.725]				
-Surplus cons.									0.958				1.079	0.773		
									[4.147]				[2.113]	[2.692]		
cay										3.095					1.076	2.091
										[3.031]					[0.407]	[1.594]
Constant	0.235	0.144	0.240	0.213	0.098	0.695	0.236	0.315	0.200	0.057	1.739	0.697	0.258	0.265	0.245	0.191
	[1.460]	[0.679]	[1.223]	[2.891]	[0.371]	[2.845]	[2.012]	[1.776]	[5.664]	[3.034]	[5.014]	[2.646]	[1.765]	[2.320]	[1.540]	[1.510]
[*p*-val, b=1]	[0.040]	[0.000]	[0.154]	[0.000]	[0.550]	[0.000]	[0.014]									
N	132	39	285	579	123	22	285	579	579	579	132	285	132	285	132	285
R^2	0.057	0.030	0.015	0.036	0.004	0.342	0.039	0.030	0.116	0.107	0.298	0.113	0.178	0.124	0.066	0.112

(*continued*)

Table 6
Continued

Panel B: Forecasting thirty-six-month returns

Gallup*	−7.485									−6.205		−4.815		−7.362	
	[−4.864]									[−3.306]		[−2.028]		[−4.701]	
Graham-Harvey		−0.050													
		[−1.084]													
AA**			−4.154												
			[−1.097]												
II**				−5.319											
				[−3.206]											
Shiller*					−1.784										
					[−0.508]										
Index*						−5.713					−3.189		−2.174		−3.686
						[−2.678]					[−2.048]		[−0.859]		[−1.577]
Log(D/P)							0.186			0.544	0.457				
							[1.554]			[1.566]	[2.141]				
-Surplus cons.								3.618				2.984	4.153		
								[3.890]				[1.973]	[2.540]		
cay									12.359					6.148	11.618
									[4.717]					[1.641]	[3.432]
Constant	0.818	0.353	0.667	0.721	0.259	0.825	0.847	0.749	0.166	2.958	2.346	1.057	1.068	0.850	0.527
	[5.675]	[1.239]	[1.955]	[3.676]	[0.692]	[3.825]	[2.051]	[4.352]	[3.607]	[2.140]	[2.773]	[3.856]	[3.618]	[7.130]	[2.635]
N	124	31	261	555	99	261	555	555	555	124	261	124	261	124	261
R^2	0.235	0.080	0.018	0.110	0.012	0.094	0.052	0.266	0.388	0.341	0.253	0.342	0.320	0.326	0.450

We estimate time-series regressions of the form:

$$R^x_{t+k} = a + bX_t + u_{t+k},$$

where R^x denotes the k-month excess return on the stock market, and X is a predictor variable. The independent variables include measures of expectations and measures of expected returns, including *cay*, the log dividend price ratio, and surplus consumption. Selected investor expectations variables are starred to indicate that we use the rescaled versions. The rescaled versions can be interpreted in units of nominal stock returns. Panel A shows results for twelve-month returns; Panel B shows thirty-six-month returns. Newey-West-based t-statistics are in brackets. Note that Michigan is excluded from Panel B because it does not have enough observations needed to compute the standard errors. In Columns (1)–(7) of Panel A, for each measure of survey expectations, we show the p-value on the test that $b=1$.

information in statistical predictors of future stock market returns. This means that no additional forecasting variables should exhibit any additional power for forecasting returns.

To interpret the regression coefficients, we use the rescaled versions of expectations that are in the same units as stock returns. Because all rescaling is linear, this has no impact on the t-statistics or R^2 in any of the regressions but does allow us to test whether $b = 1$ in Equation (5).

Panel A shows that Gallup survey return expectations negatively forecast future stock returns. The coefficient on survey expectations is -1.99. This is in contrast to the dividend yield (Column (8)) and other measures of ERs, which are positively related to subsequent returns over the sample period.

In all of the univariate specifications, the explanatory power is weak, with R^2's ranging from 0.02 (Column (3)) to 0.34 (Column (6)). Although the t-statistics are low, we are interested in the null hypothesis that the coefficient on expectations of returns is equal to one. We can reject this null with confidence for five of the seven measures of expectations. In the case of Gallup, for example, we can reject the null with a p-value of 0.04. In the case of Graham-Harvey, the p-value is 0.00. The results of these hypothesis tests are shown for all six measures of expectations at the bottom of Panel A.

Columns (10) and (11) show that the forecasting power of survey expectations is partly, but not fully, accounted for by their correlation with the dividend yield, although the magnitude varies depending on which measure of expectations we use. We present only Gallup and our index measure of expectations to save space. In Columns (12), (13), (14), and (15), we estimate analogous bivariate regressions using the *cay* and surplus consumption predictors of excess returns. In these regressions, expectations variables tend to reduce the ability of ERs to forecast future returns, even though expectations are not by themselves especially good predictors of returns.

As Panel B shows, the forecasting results, which are quite weak at a twelve-month horizon, tend to strengthen when we consider thirty-six-month returns. Expectations tend to negatively forecast returns, with part of the forecasting ability being driven by the negative correlation between expectations and our ERs measures. Note that here we exclude the Michigan data, because of insufficient observations to correctly compute standard errors.[18]

Two caveats are in order. First, our measures of expectations from surveys are surely noisy proxies for the underlying expectations. This suggests the possibility that our forecasting results are, if anything, understating the true negative relationship between expectations and future returns. Second, it is well known that in return forecasting regressions with persistent regressors may yield biased coefficients in small samples (Kendall 1954; Stambaugh 1999).

[18] The OLS coefficients are negative (the coefficient on Michigan is -0.12 with an OLS t-statistic of -4.16 and R^2 of 0.46) but are not reported in the table. There are insufficient observations to compute Newey-West standard errors in the same manner as for the other regressions in Panel B.

In the Internet Appendix, we perform the adjustment suggested by Stambaugh (1999) and show bias-adjusted coefficients. The bias adjustment turns out to be negligible for nearly all of our forecasting regressions, because expectations, which are strongly driven by recent past returns, are not very persistent.

The results of this subsection in some ways deepen the puzzle identified earlier. On the one hand, measures of ERs positively forecast realized returns, consistent with rational expectations models with changing required returns. On the other hand, survey measures of expectations negatively forecast realized returns, consistent with behavioral models in which investors extrapolate returns and are most optimistic at the top, when future returns are actually low. The evidence on the extrapolative structure of expectations is supportive of this interpretation as well.

4. Who Is on the Other Side?

Whereas the surveys document the ubiquity of extrapolative investors, in equilibrium these investors' demands must be accommodated, thereby raising the question of who is on the other side. Who are the fundamentalists? Although a full investigation of this question is constrained by data on stock market positions, previous research suggests that firms play an important role in accommodating shifts in investor demand. Baker and Wurgler (2000) find that firms issue equity when overall market prices are high, and Frazzini and Lamont (2008) find that firms may issue stock in response to retail mutual fund flows. Firms also tend to issue equity following periods of good market performance (Schultz 2003; Baker and Xuan 2009). Dichev (2007) shows that investors' dollar-weighted returns are lower than buy-and-hold returns, consistent with the idea that firms expand supply when prices are too high.[19]

Figure 7 plots the Gallup series alongside the number of IPOs in that month, obtained from Jeff Wurgler's web site. There is a strong positive correlation ($\rho = 0.60$) between the two time series, consistent with the idea that equity issuance by new firms plays a significant accommodative role.

Table 7 shows the corresponding specifications for the full set of surveys, where we regress the number of IPOs in month t on survey expectations in the same month. For all but one of the surveys (Shiller), the correlation is positive, and for all but two, the correlation is strongly statistically significant. We further show the strong positive correlation between mutual fund inflows and the number of IPOs.

In the second panel of Table 7, we replace the dependent variable with total equity issuance, expressed as a percentage of U.S. stock market capitalization. To compute equity issuance, we obtain the list of IPOs and follow-on offerings between January 1972 and December 2011 from the SDC database. To form

[19] See also Friesen and Sapp (2007), who find that fund flows lower investors' returns on the stock market.

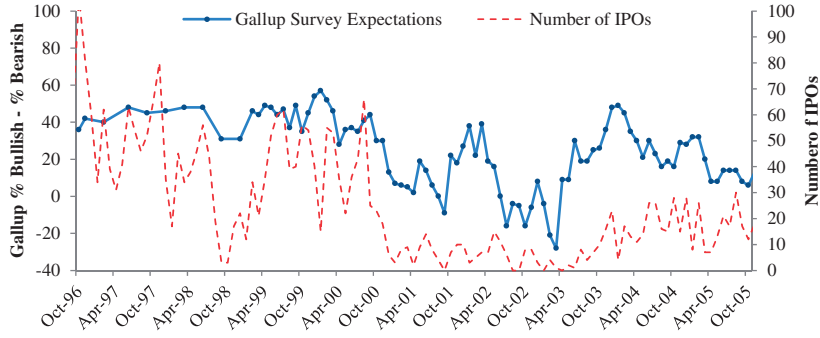

Figure 7
Gallup survey expectations and IPO activity
The solid line marked with circles denotes expectations from the Gallup survey (% optimistic – % pessimistic). The dashed line denotes the number of IPOs in that month.

Table 7
Equity issuance and stock market expectations

	NIPO				*Issuance* (% of Market Cap)			
	b	[*t*]	*N*	R^2	*b*	[*t*]	*N*	R^2
Gallup	0.514	[4.360]	131	0.362	0.000	[1.310]	135	0.019
Graham-Harvey	1.689	[1.847]	38	0.099	0.010	[1.696]	42	0.041
American Association	0.34	[2.161]	282	0.062	0.001	[2.519]	293	0.030
Investor Intelligence	0.064	[0.559]	576	0.003	0.001	[2.412]	479	0.029
Shiller	−0.386	[−0.722]	120	0.037	−0.002	[−1.657]	132	0.033
Michigan	3.682	[8.229]	22	0.424	0.002	[1.020]	22	0.010
Index	6.142	[2.457]	282	0.082	0.011	[2.420]	293	0.030
Fund flows	4,342.51	[8.989]	324	0.260	6.441	[4.087]	335	0.079

We estimate time-series regressions of the form

$$NIPO_t = a + bX_t + u_t, \text{ and}$$
$$Issuance_t = a + bX_t + u_t,$$

where *NIPO* denotes the number of IPOs in month *t*, *Issuance* denotes net issuance as a percentage of total market capitalization, and *X* alternately denotes survey expectations of future returns (Gallup, Graham-Harvey, American Association, Investor Intelligence, Shiller, or Michigan) or monthly flows into equity-oriented mutual funds. Newey-West-based *t*-statistics, based on twelve months of lags, are in brackets.

a time series, we aggregate the dollar value of these by listings by month and divide the total by the aggregate capitalization of firms in CRSP.

Table 7 shows that the results using equity issuance are much the same as when the dependent variable is the number of IPOs. For all but one of the series (Shiller), there is a positive correlation between equity issuance and investor expectations, and in four of the eight regressions, the correlation is statistically significant at the 5% level. This evidence is tentative, but it points in the direction of a model with at least two types of market participants: extrapolative investors, whose expectations we have measured in this paper, and perhaps more rational investors, some of whom are firms issuing their own equity, who trade against them. Of course, there need to be other investors

accommodating extrapolators' demand as well, but we do not have data on their expectations or behavior.

5. Discussion

At a minimum, our evidence rules out rational expectations models in which changes in market valuations are driven by the required returns of a representative investor. Although prices may behave in a way that is observationally equivalent to such models, survey expectations are inconsistent with these models' predictions.

Several behavioral alternatives to this approach have been proposed. One approach emphasizes investors' misperceptions of future cash flows or cash flow growth. These models, however, do not naturally predict extrapolative expectations of returns because market prices adjust to whatever expectations about fundamentals investors hold. For example, in Barberis, Shleifer, and Vishny (1998), expectations of returns are constant. More recently, Hirshleifer and Yu (2012) develop a representative agent model with extrapolation of productivity growth. In their model, after a positive shock, the representative investor wants to invest more as she becomes more optimistic about the production technology, expecting higher consumption in the future. However, their model does not address the survey evidence discussed here because investor expectations of stock market returns only change based on perceived changes in risk.

A third approach to fundamentals extrapolation has been to assume two or more classes of investors with different beliefs. In some of these models, one class of investors extrapolates fundamentals, and another group of investors accommodates this demand.[20] In Choi (2006), for example, following a positive shock to fundamentals, extrapolators perceive continued high fundamental growth going forward and purchase the risky asset from sophisticated rational traders. If both sophisticates and extrapolators are risk averse, the price rises, but from the perspective of the extrapolators, expectations of future returns are high, consistent with the survey evidence.

One difficulty with models in which investors extrapolate cash flows, however, is that investors' expectations are essentially uncorrelated with changes in fundamentals. Rather, the surveys suggest that many investors' expectations are driven by past returns. This suggests that models in which one class of investors extrapolates returns directly, and another class of investors accommodates extrapolators' demand, are potentially promising. Because models of this type feature two or more types of investors, they are also able to fit

[20] There are heterogeneous-agent models with other behavioral biases. For instance, models such as Scheinkman and Xiong (2003) and Dumas, Kurshev, and Uppal (2009) are based on overconfidence. In these two models, heterogeneous beliefs rely on private information, not past price changes. Neither captures the extrapolative nature of survey expectations.

the evidence that some investors (firms) may be on the other side. Early models of this form were developed by Cutler, Poterba, and Summers (1990) and DeLong et al. (1990). Barberis et al. (2013) develop a model in which variation in market prices is driven by changes in beliefs by extrapolative investors captured in expectations data and accommodated by rational investors. In their model, one can compute ER as well, and many empirical findings documented by Campbell and Cochrane (1999) and Lettau and Ludvigson (2001) obtain in equilibrium even though expectations of many investors are extrapolative. Further development of models in which at least some investors extrapolate returns appears to be a promising area of future research.

Appendix

Table A.1
Measures of investor expectations and mutual fund flows

Survey Name	Periodicity	Detail
Gallup: October 1996–December 2011	Monthly, with gaps	We use three series. The longest-running series asks investors whether they are "very pessimistic," "pessimistic," "neutral," "optimistic," or "very optimistic" about the market being measure. This series is almost complete with reporting every month, with a notable gap between November 2009 and February 2011. A shorter series (September 1998–April 2003) asks for a percentage expected return over the next twelve months. A shorter series still (September 1998–March 2000) asks for the "minimum acceptable return" over the next twelve months
Graham-Harvey: October 2000–December 2011	Quarterly	Sample is chief financial officers of large U.S. Corporations. (www.cfosurvey.org)
American Association of Individual Investors: July 1987–December 2011	Weekly; we use a monthly sampled series	Surveyed investors claim to be "bullish," "neutral," or "bearish." We measure investor expectations as "bullish" minus "bearish." (www.aaii.com/sentimentsurvey/sent_results)
Investor Intelligence: January 1963–December 2011	Weekly; we use a monthly sampled series	Investment newsletters are classified as being "bullish," "neutral," or "bearish." We measure investor expectations as "bullish" minus "bearish." (www.investorsintelligence.com/x/default.html)
Shiller Individual Investors: April 1999–December 2011	Every six months before July 2001 and monthly after that	Sample is drawn from list of wealthy investors. (http://icf.som.yale.edu/stock-market-confidence-indices-united-states-one-year-index-data)
University of Michigan Survey Research Center: September 2000–October 2005	Sporadic, 22 surveys in total	We use the mean response to the question "Now, thinking about a broadly diversified set of investments in U.S. stocks and stock mutual funds, what is the average annual percentage rate of return that you would expect it to earn over the next 2 to 3 years?"
Mutual Fund Flows: January 1984–December 2011	Monthly	From Investment Company Institute. We scale dollar flows into equity mutual funds by the size of the U.S. equity market from the CRSP. (www.ici.org/info/flows_data_2012.xls)

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