Views of Financial Economists On The Equity Premium And Professional Controversies

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Abstract

The consensus of 226 academic financial economists forecasts an arithmetic equity premium of 7% per year over 10 and 30 year horizons; and 6% to 7% over 1 and 5 year horizons. Pessimistic and optimistic 30-year scenario forecasts average 2% and 13%. Respondents claim to revise their forecast downward when the stock market rises. They perceive the profession’s consensus to be higher than it really is and are influenced by this perception. There is agreement that markets are efficient and lack arbitrage opportunities, and that government intervention in financial markets is detrimental.

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The *equity premium* is perhaps the single most important number in financial economics: the rate by which risky stocks are expected to outperform safe fixed-income investments, such as bonds or bills. It is the main input both in *asset allocation* decisions—how much of one's portfolio an investor should put into stocks versus bonds—and in the *capital asset pricing model* (CAPM)—the model used by most practitioners in computing an appropriate hurdle rate for accepting investment projects.

The academic finance profession has been teaching asset allocation and CAPM budgeting for many years. But oddly, it has been relatively quiet in recommending an appropriate "standard" for the equity premium, the key input to these models. This is unfortunate, in that without a good estimate of the equity premium, the mainstream theories are really quite useless from a practical perspective. The main reason for the scarcity of good justifications and recommendations for a "good practical estimate" is, of course, that financial economists neither know what the correct equity premium is, nor is there a consensus on how it should be estimated. There are at least three popular estimation methods—historical averages, historical price-based regressions, and theoretical calculations—each of which offers a substantially different estimate. These methods—and the implications of discrepancies in these methods—are discussed in Section I.

This paper intends to supplement existing equity premia estimates with a "common practice estimate," the consensus in the academic profession. Although the consensus is itself likely to be a weighted estimate obtained by other methods, the weighting and distribution of the application of these estimation methods is itself interesting. A consensus estimate can be a number of some relevance in classroom, courtroom, and boardroom discussions, even if it may not be the best estimate of the equity premium itself. Then again, if there was agreement on how to calculate the best estimate, there would be no need for a survey of financial economists to begin with. Still, surveys in general and this survey in particular have shortcomings, and these are discussed in Section II, which describes the design of the survey.
Section III discusses the principal survey results, i.e., the consensus view about the equity premium among the 226 responding financial economists. In brief, the most important findings are: The arithmetic 30-year equity premium consensus forecast is about 7%. It is lower at shorter horizons. The consensus perception of a pessimistic and an optimistic (at 1 in 20 probability assessments) over 30 years are 2-3% and 12-13%, respectively. And there is evidence for a "false consensus effect," in that economists seem to incorrectly anchor their forecast to a perceived consensus that is above its actual value. Section IV discusses the answers to a set of issues of interest to both financial academics and financial practitioners (e.g., whether the CAPM is a model appropriately used for capital budgeting decisions). The strongest consensus obtains that markets are efficient and lack arbitrage opportunities, and that government intervention in financial markets is detrimental. Section V concludes with a summary of the findings.
I Existing Estimates of The Equity Premium

Cochrane (1997) and Siegel and Thaler (1997) provide comprehensive surveys of the macroeconomics and finance literature about the equity premium puzzle—the question as to why stocks have historically performed so well relative to bonds. The three most prominent methods to forecast the equity premium are based on [a] historical univariate averages; [b] historical predictive regressions (such as dividend yield regressions); and [c] theoretical arguments based on reasonable compensation for the intrinsic risk of investing in stocks. Roughly, the first method provides estimates today of about 7% to 10% per year; the second of about −10% to 0% for the next year, with slow mean reversion towards the historical mean for longer horizons; the third of about 1% to 3% per year.

A Historical Equity Premia

Perhaps the most popular method to obtain an estimate of the equity risk premium is an extrapolation of historically realized equity premia into the future. Table I shows that practitioners can advocate “reasonable” long-term historical equity premium averages that range between about 5% and 9%, depending on the time frame and method of computation. (The differences between geometric [i.e., buy-and-hold] and arithmetic averages, and between different bond rates are discussed in Section III.A.)

The use of Ibbotson equity premia estimates seems to particularly widespread. The most popular finance textbook, the Brealey and Myers (1996, p.146) 1996 edition, recommends 8.2% to 8.5% which itself was sourced from the Ibbotson 1995 Yearbook. As of December 1998, the equivalent 1926-1998 Ibbotson historical arithmetic equity premium average has risen to 9.4%. Shiller (1989, Chapter 26) has assembled a longer data set. Table I shows that this data set has only mild discrepancies in stock market returns but indicates equity premia that are a full
1% lower. This is due to Shiller’s interest rate which splices corporate bonds and treasury bonds in each month. Adding back the 1% adjustment, one can justify as low an equity premium average as about 5.0%, using geometric averages over the entire 129 year history.

Yet, long-run historical performance is no guarantee for future performance. “Non-stationarity,” i.e., the fact that the underlying generating process can itself change over time, means that the world may have changed from how it was 50 years ago.\(^1\) Historical data, especially 50-year old returns, may be irrelevant to the present. Unfortunately, stock market returns are too volatile to permit relying just on recent average equity premia, instead of on long-term averages. For example, the final line in Table I shows that it is unwise to estimate the equity premium with just five years of data. The 19.0% realized arithmetic sample mean over the 1994–1998 period, aside from the fact that 19% is unusually high, has a standard error of 5.7%. This implies that a 95% confidence interval (plus or minus 2 standard errors) for the true equity premium average over the most recent five years ranges from +7.6% to +30.4%—not a useful range for practical capital budgeting purposes.

In fact, even from a theoretical perspective, an observer could interpret recently high historical stock returns to be indicative of lower (not higher) future stock returns. If the true expected rate of return on stocks were to have fallen over the last couple of years because investors were unexpectedly streaming into the stock market and competing away previously higher expected rate of returns or because investors became less risk-averse or volatility declined, recent increases in stock prices (high stock returns) would soon be followed by lower stock returns in the future. Indeed, the historical evidence by itself cannot tell us whether the recent stock market runup is an indication of lower or higher future runups, whether the recent runup was a one-time ex-post lucky realization, or even whether the recent runup is a stock market bubble about to burst.

\(^1\)Consider the painful lesson learned by Japanese stock investors in the late 1980’s who would have predicted a Nikkei well above 100,000 by 1997—instead, it is about 15,000 as of April 1997.
B Predictive Regressions

An alternative method to estimate future expected returns relies on the observation that, in the very long run, expected corporate payouts and expected investment returns must be equal. The stock price today ($P_t$) must be the present value of all future dividend payouts (or earnings). The simplest variant of this argument assumes a model in which dividends ($D_t$) grow at a constant rate ($g$), under certainty:

$$P_t = \frac{D_{t+1}}{r - g} \quad \Rightarrow \quad r = \frac{D_{t+1}}{P_t} + g,$$

where $r$ is the expected rate of return. This states that the expected rate of return is related to the current dividend yield and dividend growth rates. Using this relation as justification, many researchers (e.g., Fama and French (1988), Campbell and Shiller (1988), Blanchard (1993)) have run regressions to predict the expected rate of return on either the stock market or equity premia and generally found dividend-yields (and, to a lesser extent, other variables) to be able to predict future equity returns and equity premia. As of 1999, a regression of annual data from 1927-1997 yields

$$EQP_\gamma = -11.5\% + 3.95 \left( \frac{D_{\gamma-1}}{P_{\gamma-2}} \right) + \text{noise}_\gamma,$$

where $EQP_\gamma$ is the equity premium (here the difference between the return on a value-weighted stock index and short-term treasury investments), in year $\gamma$, and $D_{\gamma-1}/P_{\gamma-2}$ is the lagged dividend yield. As of 1999, with a dividend yield of below 1.5%, this regression predicts one-year ahead forecast of below -10%.$^2$ Variations of such "conditional models" predict equity premia ranging from about -5% to about 0%. These are not comfortable estimates: After all, why would anyone hold equity if stocks afforded lower expected returns than bonds? And, what does this imply

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$^2$Longer term versions of these models revert slowly towards the historical equity premium mean as dividends become less and less predictive and the regression puts more weight on the historical average. In late 1997, Michael Brennan updated the figures from his published model for this paper. He arrived at an estimate of -13\% ($\sigma = 13.5\%$) over one year, 0\% ($\sigma = 8\%$) over five years, 3.7\% ($\sigma = 7\%$) over 10 years, and 6\% ($\sigma = 5\%$) over 30 years.
for firms' capital budgeting decisions—should firms place a lower hurdle rate on riskier projects?

"Fortunately," aside from a number of statistical problems, such models have predicted consistently poorly *out-of-sample* at least since 1946. Goyal and Welch (1999) show that this is because simple linear models are unstable (their coefficients have declined predictably over time), the equivalent of non-stationarity for historical averages discussed in the previous subsection.

C Theoretical Arguments

The final approach to estimating the current equity premium relies on estimates of what reasonable expected rates of returns are necessary to entice the average investor to be about indifferent between investing in stocks and bonds, given historical aggregate volatility and covariances. Assuming reasonable risk aversion on behalf of such an investor, such estimates typically arrive at estimates of about 1% to 3% (Mehra and Prescott (1985)). Unfortunately, these calculation of what a "reasonable" equity premia should be have predicted about 1% to 3% for decades while the historical 1926-1998 average has increased to an all-time high of 9.4%. This puzzle deepens even further if the average investor is not tax-exempt, because equity capital gains face much lower effective tax rates than bond returns. Cochrane (1997) and Siegel and Thaler (1997) both conclude that economic theory has great difficulty in explaining such high figures (even with high degrees of risk aversion and all sorts of modifications to standard consumer choice models),\(^3\) which leaves them skeptical about the continued presence of an equity premium in the (often quoted) 6-8% range.

\(^3\)In addition to models based on standard representative agent utility maximization, these summary papers also discuss other, more "radical" explanations, such as behavioral explanations, e.g., as in Benartzi and Thaler (1995), and ex-post survival bias, e.g., as in Jorion and Goetzman (1997).
D Market Response

Disagreement about the equity premium estimate can lead to absurd consequences in the classroom, courtroom, and boardroom. With different textbooks recommending different equity premia,4 and with different methods yielding equity premia forecasts as far as 15% apart, the same project may require passing a hurdle rate of 10% in one company and 20% in another.5 This survey paper cannot answer how to best forecast the equity premium. But worse than not knowing what the best equity premium estimate is, the academic finance profession does not even know what a “common-use” or “best-practice” estimate is today. Although a consensus of academic financial economists is likely to be no more than a “meta-estimate,” i.e., a weighted average of estimates obtained by other methods, it may provide a common practice estimate which could become a focal point different from the -5%, +2%, or +9% estimated obtained by these other methods themselves.

Meanwhile, individual investors continue to vote with their dollars and, led by recent runups in the stock market, move into stocks in an aggressive fashion. On page 130 of the 1996 Mutual Fund Fact Book, the Investment Company Institute reports a strong positive correlation between stock market rallies and mutual fund net inflows. In 1995, investors poured in $164B, e.g., up from $2.8B just after the crash (in 1988), up from a $40B/year average throughout the 1980s, and up from net outflows during the 1970s. (In general, the more aggressive the equity fund investment style, the larger the net fund inflows in the 1990s.) Figure 1 plots net

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5Congress recently legislated that long-distance carriers may enter the local market, but need to pay an appropriate rate of return to the local carriers for use of the wires laid to local homes. The estimates of the total value of wires leading to homes are between $100 and $200 billion. The “common-practice” model used to compute the rate of return and accepted by all parties is the CAPM. A difference in opinion about the appropriate equity premium of about 1% per year causes a difference in $1 to $2 billion in transfer payments per year—enough to pay for many court opinions about what equity premium one should legitimately use.
inflows into the three major public equity markets (NYSE, NASDAQ, Amex). Since 1991, investors have poured resources into the stock market at (multi-year) levels not seen since just before the depression.

These inflows may be based on popular investor expectations. A recent widely cited survey by mutual fund investors finds an expectation in excess of a 16% equity premium for one year, an estimate most well-informed professionals and finance professors (see below) would consider to be much too high. In contrast, a survey of pension fund executives and others in the institutional investor community by Pensions and Investments found an expected equity premium of 3%, and the Greenwich Associates survey of fund professionals found an expected 5-year equity premium of 4–6%. Yet, because fund managers have a stake in defending their asset allocation and in taking a position one way or the other, it is not clear how biased this figure is.

A survey of finance professors has some advantages over surveys obtained from other groups. Finance professors tend to be more informed about the relevant issues, having received many years of training in the matter, having seen the historical evidence, and having had to think about what to recommend to audiences. Plus, they rarely have new clients to gain by radiating a biased view.

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7Pensions&Investments (1/12/98, page 1, “20%+ again? Keep dreaming”).

8Fund managers predicted the S&P500 stock index (i.e., without dividends which account for about 1–2% per year) to offer a 10.4% mean, a 9.8% median. A range of 8% to 14% represents about two-third of the distribution. The survey was taken in September and October 1997, and encompassed 2,309 funds of which about 75% responded. It is published in “What Now?,” by Greenwich Associates.


10Informal information from McKinsey indicates that McKinsey seems to recently have standardized on an equity premium arithmetic figure of 5% to 5.5% for valuation purposes.
II The Survey Design

This paper summarizes the results of two surveys, henceforth referred to as the first and second survey.

A The First Survey

The first survey is printed in Appendix A. Its questions fell into six categories:

1. Forecasts of the mean and 5% and 95% confidence interval for the equity risk premium, for a 1-year, 5-year, 10-year, and 30-year horizon.
2. An estimate of the mean that other academics would provide on this survey.
3. A recommendation for an asset allocation for a “new finance colleague.”\textsuperscript{11}
4. A set of nine questions regarding issues discussed in the academic literature.
5. A request to publish the identity of the respondent.\textsuperscript{12}
6. Some basic demographic information.

It was posted on the author’s WWW site (http://linux.agsm.ucla.edu/) in October 1997. In addition, a hardcopy was mailed to finance professors at 11 universities with large finance faculties, associate editors at three major journals, and the author’s colleagues at UCLA. Almost all of the responses came from the mailings, not from visitors to the WWW site. There were 114 valid completed forms, the first arriving in October 1997, the last in February 1998.

\textsuperscript{11}This question was phrased too inaccurately. The questionnaire used “new” rather than “young” in the description of the investor, and it did not distinguish between tax-exempt and taxable accounts.) Consequently, the findings are not reported in the main text. Professors recommended an average asset allocation of 82% equity (standard deviation: 23.5%). More than half of the respondents recommended 100% equity. (Nobody exceeded 100%) Another 40% of the respondents recommended at least 70% equity. Regressions indicate that prescriptions are driven more by short-term than long-term premium estimates, and more by mean premium estimates than by pessimistic-case, optimistic-case, or other-researchers’ premium estimates.

\textsuperscript{12}Because only three individuals granted this permission, this information is ignored.
To correct the major ambiguity in the first survey, whether participants had responded with a geometric or arithmetic average, respondents were contacted by email in October 1998 and asked whether their 30-year answers were arithmetic or geometric averages, and for whether their views on the 30-year equity premium forecast had changed. 85 of the 112 participants responded to the request for clarification.

B The Second Survey

The second survey is printed in Appendix B. It incorporated the feedback from a number of participants, and multiple referees, correcting several shortcomings of the first survey. In order to make responding easier, the second version of the survey was shorter than the first survey. It eliminated the somewhat less productive questions about an asset allocation and about professional views of the academic literature. It elicited explicitly both geometric and arithmetic 30-year averages, requested an equity premium defined as the difference between stocks and short-term bills (rather than between stocks and bonds), added a question about how an increase in equity prices would influence a researchers' views, added questions on the 100-year equity premium and 30-year inflation, on whether the respondent considered himself an expert or had published on the subject, survey completion time and clarity of the survey. This second version was posted both on the author's aforementioned WWW site and the Journal of Finance WWW site (http://www.cob.ohio-state.edu/~fin/journal/archive_announcements/announcements.htm), and elicited 126 responses in total. 14 responses were from individuals who were not financial economists with a Ph.D. (mostly finance Ph.D. students; their 30-year arithmetic average forecast was 5.3% on average, with a median of 5.9%). Because this was too few to draw inferences, for consistency sake, this paper focuses only on the 112 responses by finance professors and federal reserve employees to the second survey. The first response was received in January 1999, the last in May 1999.
C Response Biases

This paper describes the responses to these two surveys by 226 academic financial economists. But surveys are no panacea, and this subsection describes some of the problems.

The first set of issues were voiced by some of the respondents themselves. One financial economist considered asking for equity risk premium estimates to be a futile exercise, likening this question to asking worshipers at a place of worship about the existence of God. Another financial economist considered this survey to be futile, because economists make bad survey "subjects"—they analyze their costs and benefits from making accurate forecasts and rationally do not answer (or care if they do answer). Although these are real problems, the cost to jotting down a number that all finance professors have to tell students on a daily basis is low. And, if the finance profession cannot provide an informed estimate and opinion of the equity premium, if it were truly a matter only of divine belief, the profession should hesitate to teach either the CAPM or asset-allocation decisions to practitioners and develop alternative models. One individual indeed refused to fill out the survey, because he felt that the finance profession should not teach asset-allocation or capital budgeting techniques other than those based on derivatives. But the majority of professors contacted were willing to participate, if only because they are curious about what other finance professors recommend their students to use. The end result, 226 responses, is an unusually large number, and even though it is possible that participants may represent a biased sample, a visual inspection reveals a fairly large subset of professors at many leading universities.

A second issue relates to the modus of surveying. This survey is not a controlled experiment, but an attempt to take the pulse of the profession. The survey did not permit anonymous responses, and none was received. I was clearly identified as the person asking the question. Most finance professors would be unlikely to answer a survey sent by someone they do not know. My personal knowledge of most finance
professors allowed me to send personal notes with the request for participation, without which few responses (especially to the second survey) were received. In particular, I reminded many individuals (e.g., by email) that they had not responded, and combined requests to participate with both seminar presentations and emails sent about other issues. (Naturally, I strictly avoided mentioning whether I liked high or low forecasts.) Many respondents participated only after repeated prodding in the context of other email messages. This may have introduced a potential bias, if respondents tailored their answers to suit me. But finance professors tend not to be timid, and it is unlikely that participants would think that I knew the correct answer or was looking for a particular answer.

A third issue concerns the fact that the first writeup of this paper was available and may have been read by some respondents by the time the second survey appeared. Yet, even if it had changed some participants’ views, this paper would be interested more in their revised than in their original views.

Fourth, the presence of the Brealey and Myers historical figures on the right of each question may have induced respondents to anchor on them. In defense, the Ibbotson numbers are familiar to most finance professors, and their presence may have increased the survey response rate by allowing participants to answer without delaying until they could find the time to verify the Ibbotson numbers.

Fifth, some of the questions in the first survey were ambiguously phrased or interpreted by participants. Unfortunately, it is not possible to find a fresh set of participants to replenish the pool. To handle these issues, the analysis below explicitly describes these and any adjustments made (allowing a reader to undo them). It also reports subsets to allow the reader to focus on the cleanest set of answers (i.e., to the second survey).

In closing, this survey cannot provide the definite answer to the best forecast of the equity premium. Instead, a reader should view this survey to provide the
best publicly available estimate of the consensus view, or more accurately, of the “typical recommendation” of financial economists.

III The Academic Equity Premium Consensus

A Equity Premium Measurement Issues

Principal Issues: Unfortunately, not only is there disagreement in what method should be used to forecast equity premia, there are even more fundamental issues about how the equity premium should be computed and applied.

Indro and Lee (1997) show that it is not clear whether geometric or arithmetic compounding should be used in capital budgeting applications using the CAPM. The geometric return is earned by a buy-and-hold investment strategy, while the arithmetic return is earned by a strategy of investing $1 each period. The geometric mean is always lower than the average return. Because market returns are not perfectly serially uncorrelated (see Roll (1983)), the following translation table computes the average difference between all (overlapping) geometric and arithmetic equal length return-periods over the 1926-1997 period. To arrive at an arithmetic average, the following correction applies:

<table>
<thead>
<tr>
<th>Number of Years</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>10</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity Premium</td>
<td>0.0%</td>
<td>1.0%</td>
<td>1.4%</td>
<td>1.7%</td>
<td>1.8%</td>
<td>1.9%</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

Naturally, imputing these differences to translate geometric forecasts into arithmetic forecasts is an approximation and more accurate if historical volatility and serial correlation in equity premia will remain at historical levels.

\[ \frac{1}{T} \left[ (1 + r)^T - 1 \right] - T \cdot r - \left( \frac{T - 1}{2} \right) r^2 + \left[ \frac{(T - 1) \cdot (T - 2)}{6} \right] r^3 + O(r)^4 \]  

which can be used to adjust geometric and arithmetic averages.

\[ 13 \]
Another question concerns the risk-free rate subtracted from the market. When the CAPM is used to price a fixed cash flow in \( y \) years, it should produce the (certain) rate of return on a discount bond maturing in \( y \) years. Parsimony would thus suggest subtracting a bond of equal maturity from a stock market forecast of equal horizon. Yet, the convention for quoting (even long-horizon) equity premia subtracts the return on rolled over short-term treasury bills from the equity return. Historically, over the 1926-1998 period, long-term bonds offered a geometric return of about 5.3% (arithmetic: 5.8%), whereas short-term bills offered a return of about 3.8%. However, these averages can be deceptive. The return on both instruments over the 1926-1981 period was identical; the long-term bond has been a much better performer only since 1981. Over the sampling period (October 1997 to May 1999), the quoted yield difference between the short-term and long-term bond was about 1.1%, low in historical terms.

**Corrections:** I had originally considered the request for an average, paired with the well-known Brealey and Myers 8% estimate, to mean "arithmetic," and considered the use of a long-term bond for long-horizon premia (rather than short-term bonds) to be more sensible. Because neither is a standard in this literature, this introduced ambiguities in the first (not not second) survey.

To correct the casual distinction between geometric versus arithmetic averages, I emailed participants of the survey with a request for clarifications of answers received to the first survey. This revealed that about a third of respondents had originally quoted a geometric average. To adjust answers to the first survey, for the 25 individuals who indicated that their answer was for a geometric average (out of 85 who responded to the request for clarification), the historically appropriate adjustment of 1.8% (see page 13) was added to 5-year, 10-year, and 30-year estimates. For the 31 individuals who did not respond to the request for clarification, the following adjustment was computed. Among the 85 received clarification responses, a regression was fitted with the dependent variable being a dummy indicating whether the
response was geometric \( (G_i) \) and the independent variable being the quoted 30-year forecast \( (Q_i) \):

\[
G_i = 0.823 - 0.0877 \cdot Q_i + \text{noise}_i
\]

(4)

The fitted estimate was used as a "probability" adjustment \( (p_g(Q_i) \equiv \hat{G}_i) \) to translate the original answers by the 31 participants who had not responded to the request for clarification into arithmetic averages:

\[
a_i = Q_i + p_g(Q_i) \cdot 1.8\%
\]

(5)

for 5-year, 10-year, and 30-year forecasts. No adjustment was necessary for 1-year forecasts.

The first survey asked for the difference between the equity premium and the long bond, whereas the second survey asked for the difference between the equity premium and short-term treasuries. To translate all quoted first survey forecasts into bill-adjusted equity premia, a reasonable adjustment into treasury bill-adjusted rates was added (1% for the 5-year, 10-year, and 30-year forecasts, and 0.5% for the 1-year forecasts). A reader interested in using an equity premium forecast relative to a bond rather than a bill should subtract about 0.5% to the one-year bill-quoted equity premia, and about 1% to the longer-term bill rates.

These adjustments were applied to all quoted figures from the first survey: long-horizon and short horizon equity premia, optimistic and pessimistic scenarios, and consensus estimates.

Although the first survey was ambiguous, the second was clear. It requested explicitly geometric and arithmetic averages, and requested the "standard" figure, the difference between stocks and bills. The analysis below also describes the 112

\[\text{This is lower than the historical 1.5% difference because some participants may have assumed a more conventional definition of equity premia, without reading the description more carefully. (This adjustment adds 112/226*1.0%~0.5% to the overall average.)}\]
responses to the second survey by itself, in addition to the overall adjusted response average by 226 economists.

B Long-Horizon Equity Premia

The bottom-right panel of Figure 2 plots the distribution of 226 answers to the 30-year arithmetic forecast for the equity premium using the largest set of answers.\footnote{On the first survey, there were 5 extreme outliers, in which the respondent quoted either 12\% or 1,500\%. I sent emails to these respondents to ask them if this was their correct estimate of the per-annum equity premium. All 5 respondents replied that they had misread the survey, either assuming that I had asked for the market expected return (not net of the risk-free rate), or that I had asked for a compound figure. Although it is possible that they meant to say 12\% and I unduly influenced them, this is unlikely—these particular finance professors happened to have made their relevant views on this issue publicly known in other venues. In 4 cases, the answer in the survey was corrected. In 1 case, the respondent indicated that his numbers were wrong, but that he was too busy to fill out the survey again. This answer has been removed from the survey. The second survey had some automatic checks to alert respondents to extremely large or small estimates, primarily useful for catching individuals quoting total rather than average returns.}[15] Impulse lines within the bars plot the distribution of answers to the second survey only. Table II describes the univariate statistics.

The average arithmetic 30-year average in the profession is about 7\%, as is the median. Tables also report a truncated mean on series truncated at the 5th and 95th percentile, in order to reduce the influence of outliers,\footnote{There is one outlier of 15\%, which is responsible for an 0.04\% higher estimate. In correlation and regression computations, this observation was eliminated.}[16] the average drops by 0.1\%. Figure 2 shows that the mode response is about 8\%. Still, only about 20\% of participants on either the first or the second survey picked an (unadjusted\footnote{This is the only exception where the frequency of \textit{unadjusted} estimates to the first survey is quoted. This is because the question is how many individuals just copied the provided 8\% Ibbotson estimate provided by the survey. Indeed, the median and mean unadjusted response to the first survey was about 6\%, not 8\%.}[17]) number between 8\% and 8.9\% (8.5\% being the largest), equal to the historical Ibbotson estimate quoted by the questionnaire itself. The historical average does seem to have strong influence, but about 80\% of participants provided their own estimate...}
instead. The standard deviation is about 2.0%,\textsuperscript{18} the first quartile is 6%, the third quartile is 8.4%. There is a pronounced clustering between 5% and 9%, but there are more individuals below 5% than there are above 9%. Remarkably, the figure does not reveal multi-modality—the profession does not divide neatly into two or three camps each of which forecasts its own number. Many individuals seem to choose a convex combination of the above-mentioned forecast methods, with most of the weight on the long-term historical average.

**Robustness:** If one does not impute an answer using $p_g$ where no clarification was received and instead omits such unclarified first survey answers, the mean 30-year equity premium forecast is 7.1% for 197 individuals. For the 112 individuals who responded to the second version of this survey, the average arithmetic 30-year equity premium forecast is 6.8%, 0.4% less than the overall 7.2% average. This is comforting: the estimate obtained from the more accurate question is reasonably close to the full-sample average requiring imputations. Still, the interest rate adjustment to the first survey may have been too drastic and thus may have slightly inflated the reported equity premia forecast consensus.\textsuperscript{19} Another reason is that the average respondent claims to follow a negative "feedback" rule, in which stock market increases reduce the individual's forecast (described in this subsection below), Consequently, a part of the lower consensus forecast to the second survey can be attributed to the rising stock market of 1999.\textsuperscript{20} A reader may prefer putting more weight on the more recent second survey forecasts as of 1999, and thus favor a number closer to 6.8% than the all-participants' 7.2% arithmetic 30-year forecast.

\textsuperscript{18}Nordhaus (1994) surveys a set of economic and natural researchers about the potential impact of global warning, and finds remarkably high dispersion in expert opinion. This equity premium survey mirrors this dispersion in expert opinion in finding high across-expert dispersion.

\textsuperscript{19}The 25 30-year forecasts that started as geometric estimates, as indicated in the clarification emails received, ended up with an adjusted mean of 8%; the 60 30-year forecasts that started as arithmetic estimates ended up with a mean of 7.4%; the 29 30-year forecasts that were interpolated ended up with a mean of 7.5%. These are too few observations to permit statistical inferences.

\textsuperscript{20}An extreme view is that if the 30% stock market return of 1998 was entirely expected to mean-revert by the 30% of participants who claim to follow a positive feedback rule, it would explain most of the 0.4% higher forecast at the end of 1997.
In sum, 6.8% to 7.0% is a robust estimate for the consensus about the 30 year arithmetic equity premium among financial economists. The range is small compared to the variation across economists and especially compared to the variation in application of this figure (e.g., in disagreements over exactly what calculations one should use for (long-term) capital budgeting purposes, geometric or arithmetic premia, bills or bonds, uncertainty about beta, etc.).

**Geometric Averages:** There were 112 responses on the second survey that featured both an arithmetic 30-year and a geometric 30-year average. The geometric average was 1.6% lower than the arithmetic average, comfortably close to the 1.8% computer-imputed difference between geometric and arithmetic premia. For 136 individuals explicitly having provided a geometric 30-year equity premium forecast (both on the second and on the clarified first survey), the consensus was 5.3%. Imputing a geometric average from the arithmetic average of 226 individuals described above yields forecasts of about 5.0% to 5.4%. In sum, the academic consensus for the geometric 30-year equity premium is around 5.2% per year.

**100-Year Equity Premium Forecast:** There were only 45 responses to the (optional) request for 100-year forecasts on the second survey. Consequently, these responses are not formally analyzed. The respondents to this question were more pessimistic than the average economist, indicating a 6.5% arithmetic average for their 30-year equity premium. These economists' consensus 100-year equity premium forecast of 5.5% per year was about 1% below their 30-year equivalent.

**Stock Market Forecast:** The second survey also requested a 30-year arithmetic stock market forecast (mandatory). The average was 11.0% (standard deviation 2.1%). Subtracting the equity premium forecast from the stock market forecast, economists indicate an implied 30-year rate of return on investing in short-term bills of about 3.8% to 4.2%, a rate below the average treasury bill rate (of 4.8%) prevailing at the time each individual answered the survey and close to the 4.5% yield that the T-bill offers today. It is noteworthy that the consensus inflation forecast
was about 3%, indicating that today’s real short-term yield seems more attractive by expected standards.

Recent Updates: Among the 85 individuals answering the request for email clarification of their answers to the first survey—about a year later—13 respondents indicated that they would quote a different rate (perhaps because the 1998 rise in the stock market influenced them). Nine individuals lowered their estimate, four increased it. The typical revision was about 0.5% to 1%. In the total sample of 226 responses, the impact of these revisions is on the second digit after the decimal point, and thus can safely be ignored.

Influence of Market Movements: Almost all finance professors subscribe to the view that markets follow a random walk in the short-run. Updating of equity premia opinions is likely to be a very slow process and changes in opinion are likely to be marginal only. This allows treating answers in one month similarly to answers in another month.\textsuperscript{21} Still, participants on the second survey were also asked to indicate whether they would be positively, negatively, or not at all influenced by stock market movements \textit{on the margin}. Coding this feedback rule as $+1$, $-1$, and 0, respectively, the mean response by 112 participants to this question was $-0.367$, with a standard deviation of 0.5. Thus, the average participant claims that a bull market induces a lower equity premium forecast. Unfortunately, because responses were so clustered in time which limited variation in lagged recent stock returns, it is difficult to observe the correlation between answers and lagged stock returns directly.

Respondents indicating that they follow a positive feedback rule are also more optimistic about the market. 66 individuals indicate they are not influenced by stock market movements on the margin, and provide 7.3% as their equivalent av-

\footnote{There is no visible correlation between any (mean, optimistic, pessimistic, or other) equity premium estimates of economists and either the level or recent return of the S&P500, once controlled for the time of the response. Non-academics may not subscribe to this random-walk hypothesis, however. In particular, the expectations of retail and institutions investors mentioned in Section I.D may have changed since they were reported in the press.}
verage; 43 individuals follow a negative feedback rule, with 5.7% as their equivalent average; and only 2 individuals follow a positive feedback rule (with 4% and 8% as their average arithmetic 30-year equity premium estimates). The fact that there is a correlation between the indicated feedback rule and the forecast should not be surprising, given the stellar historical stock market performance.

A related question is whether respondents indicating a positive feedback rule responded more to recent stock returns. A regression explaining the 30-year forecast with a linear date index and a variable which crosses the coded feedback rule with the most recent one-month return before each response confirms that recent stock price movements indeed seem to have influenced those individuals which claimed a positive feedback rule more and in a statistically significant fashion. The crossed coefficient explaining a one-year equity premium forecast is larger, but with only 57 one-year forecasts, less statistically significant.

There was no reliable correlation of equity premia forecast with inflation forecasts (about 3% on average), or prevailing bond or bill yields.

C Shorter-Horizon Equity Premia

In the second survey, shorter-term equity premia estimates were optional. One can either report statistics over all reported answers, or report both shorter and longer equity premia forecasts only for those individuals who provided both in order to hold identity constant. Because the resulting differences in these methods are small, the tables report the overall averages only.

Equivalent to the procedure for the 30-year equity premia estimates, for responses to the first survey, quoted 5-year and 10-year forecasts were translated into arithmetic averages. When geometric answers were indicated on the clarification, the answer was increased by 1.8%; when no answer was received, the \( p_g \) imputation was used. Further, bond returns were adjusted into bill returns, adding 1% to 5-year and 10-year forecasts, 0.5% to 1-year forecasts.
The largest set of adjusted responses, 170 in total, indicates an arithmetic 10-year equity premium forecast of 7.1% (standard deviation: 2.0%; median 7.0%), just slightly below the estimate for the equivalent 30-year forecast. For the 58 individuals answering this question on the second survey, the average was slightly lower (6.8%) and practically identical to these individuals' 6.8% 30-year arithmetic equity premium forecast. (The average difference between 10-year and 30-year arithmetic equity premia forecasts when both are available is 0.2%.) It is fair to characterize any difference between 10 and 30 year equity premia forecasts as not meaningful.

However, the two shorter term arithmetic equity premium forecasts of 1-year and 5-years are lower. Relative to the 10-year and 30-year forecasts, the 5-year forecast of about 6.7% is 0.5% lower and the 1-year forecast is about 1.5% lower. (The average differences when both are available are 0.7% and 1.4%.) This is primarily due to a more frequent presence of negative forecasts rather than a left shift of the distribution. Twelve (two) respondents recommend an estimate that suggests that they believe bills will outperform stocks over the next year (next five years).\(^{22}\) Compared to the long-term forecast, there is considerably (more) disagreement among economists for what the best short-term equity premium forecast is. The truncated standard deviation across financial economists rises from the 1.7% for 30-year forecasts to about 2.5% on a one-year forecast (although the untruncated standard deviation rises considerably more). Note that this is not the same as a higher uncertainty about their forecasts (which is discussed below); it is lack of consensus that we observe.

Finally, about 20% of survey participants offered an expected premium term structure that was monotonically increasing in horizon; 50% had the expected premium term structure monotonically decreasing.

\(^{22}\)The decline in forecast by horizon is comforting in another sense: many financial economists did not just copy the provided fbottom estimate, but instead provided their own estimate. The number of unadjusted 8% answers drops from the 20% for the 30-year estimate to about 15% for the 1-year estimate.
D Optimistic and Pessimistic Scenarios

Respondents were also asked to give their 5th percentile and 95th percentile scenarios for the equity premium. This was an optional question, so the number of responses to these questions is lower than the number of responses to the earlier question about the 30-year mean forecast. Most finance professors are acutely aware of the value of their time, and as a result are unlikely to have given much thought to questions that are above and beyond what they already tell audiences on a regular basis. Because they rarely provide optimistic and pessimistic scenarios, scenario estimates are intrinsically less reliable than their own expected forecasts (subsection III.B) and estimates of other professors' forecasts (subsection III.E). This unreliability is also reflected in a much wider dispersion of answers, and some inconsistencies. There were 4 responses for which the optimistic scenario was not better than the average forecast, and 1 response for which the pessimistic scenario was not worse than the average forecast. These 5 responses were first eliminated. The reader should focus primarily on statistics based on medians and truncated means instead of plain means, due to their robustness relative to outliers. Further, the discussion below describes rough figures, because estimates are sensitive to which central statistic is used.

Figure 3 graphs the expected, most optimistic, and most pessimistic scenario when individuals are sorted by their 30-year arithmetic forecast. The statistics are provided in Table III. The top half of Table III shows that the most optimistic arithmetic 30-year equity premium scenario consensus is somewhere between 11% and 13% per year. (For 56 answers to the second survey, the median and mean is about 11%.) Short-term optimistic-case scenarios are successively more optimistic, but the magnitude depends strongly on the central statistic used. The 10-year optimistic scenario arithmetic equity premium forecast lies at around 15%, the five-year optimistic scenario lies at around 20%, and the one-year optimistic scenario lies between 24% (median) and 30% (mean). To put this in perspective, the annual stock market performance in the last 3 years was about 25% to 30% per year, implying
an equity premium of just about 25%. In the minds of many academics, these were three years of rather unusual (one in twenty) realizations.

The bottom half of Table III shows that the pessimistic arithmetic 30-year equity premium scenario (at the 5 percent level) consensus is somewhere between 2.2% (mean) and 3.2% (median) per year. (For 55 answers to the second survey, the median and mean is about 4%—higher than it is in the overall sample.) Shorter-term pessimistic-case scenarios are successively more pessimistic. The 10-year pessimistic scenario forecast is about -1% (mean; +1% median), the five-year pessimistic scenario lies around -8%, and the one-year pessimistic scenario lies between -20% (mean) and -24% (median). Even at a probability of 1 in 20, financial economists tend not to believe that a meltdown of Japanese style proportion that lasts for 10 to 30 years. Indeed, it is remarkable that the typical pessimistic-case scenario foreseen by financial economists is roughly the return suggested by theory (Section I.C).

The implied average of extremes is about 1 percent higher than the equity mean forecasts themselves. Although there was no requirement that intervals be symmetric, this may be an indication of a mild inconsistency; a symmetric interval would have suggested extremes that should have been shaded a bit more downward. (However, a small sample and inaccuracy in the correction factors render such inference unreliable.) Further, the difference between the optimistic and pessimistic scenarios indicate that the finance profession recommends a view of volatility which is roughly consistent with the random walk hypothesis, with 1-year outcome variability being about half of 5-year outcome variability ($\sigma_T \sim \sqrt{T} \sigma$), one third of 10-year outcome variability, and (a somewhat too high) quarter of 30-year outcome variability. Still, the 90% confidence range (an equity premium interval of 50% which, assuming a Gaussian normal distribution covers about ±1.65 standard deviations) indicates that financial economists foresee higher equity premium volatility in the future, on the order of 15% per year, which is similar to the historical volatility of the equity premium (Table I).
There are some noteworthy correlations. There is a negative correlation between the optimistic and pessimistic estimates across economists—economists who indicate a more positive optimistic scenario also indicate a more negative pessimistic scenario. Thus, variation in optimistic/pessimistic scenarios are driven more by differences in confidence than by differences in estimates of the mean.

The correlation between the pessimistic and mean equity premium forecast is positive—economists with higher equity premium mean forecasts also provided more optimistic pessimistic scenarios. Thus, the pessimistic estimates to the survey tend less to reflect disagreement on where the economy lies in terms of the risk-return tradeoff—in which case one would expect individuals indicating a more positive equity premium mean to also indicate a more negative possible outcome—but across-economist views about the attractiveness of the stock market.

E The Perceived Consensus

What equity premium do financial economists believe their peers are recommending? This is interesting for a number of reasons. Economists are likely to weigh their otherwise private estimates against what they perceive to be a common consensus, and come up with a posterior estimate that averages the two. An incorrect perception of the estimates of others can delay the process of collective adjustment. If everyone believes everyone else believes the equity premium to be 8%, then one may be reluctant to quickly adjust one's view away from 8%. In this sense, this survey may nudge the profession towards an improved aggregation of opinions. Further, it might indicate the extent to which this survey is informative to researchers. If economists were already right on target in their estimation of the consensus view, this paper might not be informative to the finance profession. Yet, if economists personal views and views of the profession's consensus coincided, one would consider such an estimate to be more reliable.

Table IV provides statistics on the views of financial economists about their
own consensus. Oddly, it is not monotonic in the horizon length, although differences are small. The belief is that the 30-year and 5-year equity premium consensus are about 7.6% (mean) to 7.8% (median; 7 to 7.5%, respectively, for the 30-year forecasts if only the second survey responses are used); the 10-year equity premium consensus is seen to be around 8%. Comparing this to the equity premia forecasts themselves, the popular view of the profession’s consensus is that it is higher than what it actually is. The misperception ranges from about half to one percent for the 30-year estimate to about 3% for shorter term estimates. Note also that economists are more confident in assessing their mutual consensus than the equity premium itself, even over 30-years. However, there is still substantial dispersion among economists: they do not know their own consensus.

The influence of this overestimate is further explored in Table V. The left part of the table provides the univariate means and standard deviations for the set of researchers with both a forecast and a consensus estimate. The misperception seems to be somewhere between 0.5 to 1.0% for most horizons. However, the fact the economists overestimate the profession’s consensus may have no further consequences—they may not be influenced by their perception of their colleagues and just invariably believe everyone else uses the Ibbotson 8% figure. Their own equity premium forecast may be unaffected. To explore whether there is an “anchoring” effect, i.e., whether economists have a perception of the consensus and shade their own equity premium forecast toward this perception, we run a regression with the demeaned consensus on the demeaned forecasts. A coefficient of one indicates perfect shading, a coefficient of zero perfect irrelevance.

The regressions reported on the right side of Table V reveal that the same economists indicating they believe the professional consensus to be higher also offer a higher equity premium forecast themselves. This is especially pronounced on the 1-year horizon and on the 30-year horizon; it is weak on the 5-year and 10-year

\[23\] Naturally, economists may settle on their own forecast and believe it is also held by the profession. However, it is not even clear if there is a philosophical difference between this view and the view stated in the text.
horizons. One explanation may be that financial economists are often concerned with and talk about either short horizon (1-year) or long horizon (30-year) rates, but less often so for 5-year and 10-year rates.

In sum, the regressions are consistent with a "false consensus" effect, i.e., an attempt by economists to have provided an average forecast that lies between their personal estimate and their perceived consensus estimate. If this is the case, the results of this survey may help economists better "anchor" their own predictions relative to the profession, and would cause a downward revision in the aggregate consensus forecast.

F Other Statistics

The second survey also gathered some other statistics. For 110 responses, the average time spent on the survey was about 3.5 minutes. On a scale of 1 to 10, with 1 indicating perfect clarity and 10 indicating perfect opacity, the mean was 1.8. There was a small negative correlation between perceived clarity and equity premia mean estimates, and a small positive correlation between time spent and equity premia mean estimates. In a regression, the coefficients indicate that an individual who felt one point more confused and an individual who spent about 2 minutes less indicated an arithmetic equity premium mean of about 0.25% less.

The second survey also asked financial economists whether they considered themselves to be relatively better informed with respect to the equity premium and whether they have published in the area. There were 51 responses indicating no prior relevant publication, 13 of who considered themselves less qualified (mean arithmetic 30-year equity premium: 6.6%), 3 of whom considered themselves better qualified (mean: 7.3%), and 35 of whom considered themselves equally qualified (mean: 7.3%). Of the 17 individuals who indicated a relevant publication, 6 considered themselves better qualified (mean: 6.4%), 11 considered themselves equally
qualified (mean: 6.6%). Thus, lower forecasts tend to be either be individuals who had published or individuals who felt ill qualified to answer the survey.

IV Questions Debated in Academic Finance

The first survey took the opportunity to add a set of questions that asked their views on issues that are commonly debated in the academic literature, and on which most researchers who attend finance conferences and seminars are likely to have an interest in (or at least an opinion on). Answers could range from "1" (strongly disagree) to "3" (neither agree nor disagree) to "5" (strongly agree). Table VI lists both the questions and the received responses.

A Mean Responses

My first question asked whether the stock market is more likely to follow a random walk or more likely to have long horizon negative autocorrelation. It turns out that more professors have an opinion ("agree" or "disagree") than no opinion ("neither agree nor disagree"), but when they do this opinion is roughly evenly split. The jury is still out.

My second question concerned the use of the capital asset pricing model (CAPM) for capital budgeting purposes. Although a sizeable minority of professors do not believe it is "good enough" to be used for capital budgeting purposes, a majority feels it is.

The third question asked whether size and book/market values are more likely to be characteristics (in the Daniel and Titman (1997) sense) or more likely to be risk-factors (in the Fama and French (1993) sense). The respondents mildly favored the view that they are characteristics.
The fourth question asked whether the factors/characteristics (size/book-market/price-earnings/momentum) are likely to be useful for portfolio selection in the future. The profession does not have a strong view on this issue. This ambivalent view is remarkable, given the large number of publications and strong ongoing interest in detecting past “anomalies.” Prior to conducting this survey, it had seemed to the author that the common working hypothesis in finance is that at least the major anomalies are universally viewed to represent persistent phenomena. This survey does not confirm this.

The fifth and sixth question asked whether markets are basically efficient and arbitrage-free. There was much agreement here: financial economists feel that, by-and-large, financial markets are efficient. The sixth question asked whether economists believe in arbitrage opportunities—an ability to make money without risk. Apparently, the respondents did pay attention, and also marked a strong view in favor of absence of arbitrage.

The only question that elicited more support than absence of arbitrage was the question about whether governments should intervene more in financial markets. The profession strongly feels that this would be counterproductive.

Finally, two questions related to corporate finance. The eighth question asked whether large Fortune-500 firms have too little debt in the capital structure, and whether share repurchases dominate dividends as a means of payout. The profession has no views on whether large Fortune-500 firms would be better off with more debt in their capital structure. But they perceive dividends to be an unwise mechanism for corporation to disburse funds relative to share repurchases.

In sum, it is remarkable how weak the views of financial economists are, even on issues as absence of arbitrage that are typically seen as relatively uncontroversial: about one quarter of the participants responded with a value between strong disagree and “neither agree nor disagree.” On most questions, there was neither strong
agreement nor strong disagreement by many participants, even when central issues in finance and stark positions were concerned.

B Correlations

A simple correlation analysis (both Pearson and Spearman) revealed some interesting patterns. (Unless otherwise noted correlations are on the order of 25-35% with significance levels of 1% and lower.) Going down the triangular matrix reveals the following: Researchers who believe that the stock market is a random walk and not mean reverting consider the CAPM to be good enough for corporate use (Q2), do not believe in (Fama-French) factor stationarity (Q4), and believe that markets are efficient (Q5). Researchers who believe the CAPM is good enough (Q2) also believe in efficient markets (Q5). Researchers who believe in market book-market, size, and price earnings are risk factors rather than firm characteristics (Q3) are more inclined to believe in market efficiency and have (mild) feels that firms do not have too little debt in their capital structure. Similarly, researchers who believe that markets are by-and-large efficient (Q5) again believe that firms do not have too little debt in their capital structure. Finally, researchers who believe that firms do have too little debt in their capital structure also believe that repurchases are better than dividends.

Remarkably, there is no strong correlation between the 30-year equity premium forecast and any of these questions, except with Q3: researchers who believe that size/book-market/price-earnings/momentum are risk-factors rather than firm characteristics believe that the 30-year equity premium will be higher. 1-year forecasts show positive correlations with Q1 and Q3: individuals who believe in the random walk (rather than mean reversion) believe in higher 1-year forecasts. Individuals who believe that size/book-market/price-earnings/momentum are risk-factors similarly believe in higher 1-year equity premia. There is a mild positive relation between wider (less confident) 30-year optimistic-pessimistic range forecasts and both belief in the absence of arbitrage (Q6) and a belief that size/book-market/price-
earnings/momentum are risk-factors (Q3). There is no strong relation of consensus estimates and any of the nine questions.

V Conclusion

This paper presents the results of the first comprehensive survey of financial economists. 226 finance professors shared their forecasts and perspectives on the equity premium and some related issues.

The survey finds that the average arithmetic 30-year equity premium forecasts hovers around 7%. On the one hand, this consensus recommendation is not as high as the current historical 9.4% arithmetic average quoted by Ibbotson or even as high as the Brealey and Myers (1996, p.146) quoted average of 8.4% per year. Practitioners who would prefer to base their estimates on the perceived academic consensus should thus use a lower 7% in their application of CAPM capital-budgeting decision. On the other hand, the consensus estimate is also not as low as the 1% to 3% implied by theory. The 7% equity premium consensus forecast is simply too high for comfort among macroeconomists who want to dismiss the 6%-8% observed historical equity premium as too high, as a “lucky streak,” or ex-post survival bias. One version of this argument has it that rational and learning market participants (presumably our professors) have bid up recent equity prices in order to calibrate to a 1% to 3% future equity premium. Again, this is not borne out by claimed expectations. Even a large fraction of the financial economics profession itself does not seem to believe prices reflect much lower future returns. Indeed, even the typical most pessimistic scenario (at the 5 percent level) indicate a consensus no worse than a 2 to 3% arithmetic average over 30 years. Theoreticians may still need to continue tweaking common models of consumer choice to reconcile an equity premium as high as 6% with reasonable levels of risk aversion, if not for a representative agent, then at least for an individual investor, or to move to a different paradigm altogether.
There is some evidence that financial economists revise their forecast down as markets increase ("negative feedback"). Economists claiming to follow a negative feedback rule tend to offer smaller equity premia forecasts today.

The survey further found a term-structure of equity premia forecasts. There appears to be consensus that the equity market will offer lower returns in the short-run (unfortunately, this consensus also prevailed on the first survey in early 1998).

The survey also found evidence of a "false consensus effect." On average, finance professors believe that their consensus is about one percent higher than it actually is, especially on shorter horizons; and there is evidence that participants "anchored" their own responses on their perceptions of the professional consensus. There is a strong correlation between a researcher's perception of the consensus and his/her own estimate. Taken together, this indicates that the publication of this paper may further shade down the consensus forecast among financial economists.

Finally, the survey disclosed the views of financial economists on some other issues. There is strong agreement among financial economists that the government ought to decrease its intervention and regulation of public securities markets, and that markets are by-and-large efficient and arbitrage-free. They also would mildly recommend to corporations to use more share repurchases and fewer dividends. And they have no strong views, one way or another, whether the stock market follows a random walk, whether firms can reasonably use the CAPM for capital budgeting, whether large firms should use more debt financing, whether size and book/market are risk factors or characteristics, or even whether size and book/market will continue to predict stock returns in the future.
References


Figure 1. Net Inflows Into The NYSE, NASDAQ, and AMEX, computed as the difference between the value-weighted percent stock market return and the value-weighted percent increase in stock market capitalization, computed from the CRSP tapes. This difference reflects all new equity issuing activity and subtracts share repurchases, dividend payouts, and delistings. 1962 and 1973 were excluded, because CRSP added AMEX and NASDAQ, respectively, which would misleadingly have indicated substantial one-year large market net inflows.
Figure 2. The distribution of arithmetic equity premia forecasts by financial economists. The surveys from which these histograms were computed are reproduced in the Appendix. Statistics are over both the first and second survey (after adjustments to first survey responses explained in Section III.A). The bottom right graph reports responses to the second survey as impulse graphs.
Figure 3. The Pessimistic-Scenario, Average, and Optimistic-Scenario 30-Year Arithmetic Equity Premium Forecast by 226 financial economists. Forecasts from the first survey were adjusted, as explained in Section III.A. In both figures, individuals are indexed (lined up) identically, sorted by their mean forecast. Clustering in 1-year responses is induced because of discreteness in 30-year responses and the sorting procedure.
Table I

Historical Stock Market and Equity Premium Performance

Ibbotson estimates are published in the Ibbotson Year-End Summary Report 1998. They are based on the S&P500 return with dividends ("large company stocks") and 30-day to maturity treasury bills. Shiller indices are published in Shiller (1989, Chapter 26) and updated on http://www.econ.yale.edu/~shiller/chapt26.html. They are based on the dividend-adjusted S&P500 index (formerly called the S&P composite index) and a short interest rate spliced from corporates and treasuries, and computed from January to January index averages (of the following year), not December to December closing prices. Thus, the last price used in the computations is an average January 1999 index price. Geometric means are computed as

\[ g_T = \sqrt[\frac{T}{1 + r_{my}} / \prod_{y=1}^{T}(1 + r_{fy})], \]

where \( r_{my} \) is the market return and \( r_{fy} \) is the risk-free rate in year \( y \). Arithmetic statistics are computed from a \( T \)-year series of \( (r_{my} - r_{fy}) \) in a standard fashion. 

Unreported: averages computed using the value-weighted stock market index obtained from CRSP have means of about 0.3% more and standard deviations of about 2% more than equivalent S&P returns. Unreported: Inflation from 1926-1997 was about 3.1%.

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<td>Shiller</td>
<td>1994-1998</td>
<td>5</td>
<td>18.4%</td>
<td>19.0%</td>
<td>-0.0%</td>
<td>28.6%</td>
<td>5.7%</td>
</tr>
</tbody>
</table>
Table II

Univariate Statistics For Arithmetic Equity Premia Forecasts

The table presents the distribution of arithmetic equity premia forecasts by financial economists. The surveys themselves are reproduced in the Appendix. The “S2” line reports only responses to the second survey; other lines report statistics from both surveys (after adjustments to first survey responses explained in Section III.A). Mean5 and Stddev5 are the mean and standard deviations after each series is truncated at its 5th and 95th percentile.

<table>
<thead>
<tr>
<th>Description</th>
<th>Mean5 (Mean)</th>
<th>Stddev5 (Stddev)</th>
<th>Min</th>
<th>Q1</th>
<th>Mdn</th>
<th>Q3</th>
<th>Max</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-Year Forecast</td>
<td>7.1% (7.2%)</td>
<td>1.7% (2.0%)</td>
<td>1.5%</td>
<td>6%</td>
<td>7%</td>
<td>8.4%</td>
<td>15%</td>
<td>226</td>
</tr>
<tr>
<td>30-Year Forecast (S2)</td>
<td>6.7% (6.8%)</td>
<td>2.0% (2.2%)</td>
<td>1.5%</td>
<td>5%</td>
<td>7%</td>
<td>8%</td>
<td>15%</td>
<td>112</td>
</tr>
<tr>
<td>10-Year Forecast</td>
<td>7.0% (7.1%)</td>
<td>1.9% (2.0%)</td>
<td>-2%</td>
<td>6%</td>
<td>7%</td>
<td>8.4%</td>
<td>15%</td>
<td>170</td>
</tr>
<tr>
<td>5-Year Forecast</td>
<td>6.7% (6.7%)</td>
<td>2.0% (2.6%)</td>
<td>-4%</td>
<td>5%</td>
<td>7%</td>
<td>8.0%</td>
<td>17%</td>
<td>171</td>
</tr>
<tr>
<td>1-Year Forecast</td>
<td>6.5% (5.8%)</td>
<td>2.4% (4.5%)</td>
<td>-9.5%</td>
<td>4%</td>
<td>6%</td>
<td>8.5%</td>
<td>18%</td>
<td>158</td>
</tr>
</tbody>
</table>
Table III

Univariate Statistics For Arithmetic Equity Premia Optimistic and Pessimistic Outcome Forecasts

The table presents the distribution of arithmetic equity premia pessimistic and optimistic scenarios (at the 5% level) by financial economists. The surveys themselves are reproduced in the Appendix. The "S2" line reports only responses to the second survey; other lines report statistics from both surveys (after adjustments to first survey responses explained in Section III.A). Mean5 and Stddev5 are the mean and standard deviations after each series is truncated at its 5th and 95th percentile.

<table>
<thead>
<tr>
<th>Description</th>
<th>Mean5</th>
<th>(Mean)</th>
<th>Stddev5</th>
<th>(Stddev)</th>
<th>Min</th>
<th>Q1</th>
<th>Mdn</th>
<th>Q3</th>
<th>Max</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimistic 30-Year Scenario</td>
<td>12.8%</td>
<td>(13.3%)</td>
<td>4.9%</td>
<td>(6.7%)</td>
<td>3.5%</td>
<td>9%</td>
<td>11.2%</td>
<td>16%</td>
<td>51.5%</td>
<td>158</td>
</tr>
<tr>
<td>Optimistic 10-Year Scenario</td>
<td>15.4%</td>
<td>(16.5%)</td>
<td>5.5%</td>
<td>(10.9%)</td>
<td>6%</td>
<td>11%</td>
<td>15.4%</td>
<td>19.1%</td>
<td>101.2%</td>
<td>104</td>
</tr>
<tr>
<td>Optimistic 5-Year Scenario</td>
<td>21.2%</td>
<td>(23.1%)</td>
<td>11.5%</td>
<td>(22.3%)</td>
<td>8%</td>
<td>11%</td>
<td>17.8%</td>
<td>26%</td>
<td>201%</td>
<td>101</td>
</tr>
<tr>
<td>Optimistic 1-Year Scenario</td>
<td>28.6%</td>
<td>(29.2%)</td>
<td>14.9%</td>
<td>(17.0%)</td>
<td>6%</td>
<td>17%</td>
<td>26%</td>
<td>51%</td>
<td>101%</td>
<td>71</td>
</tr>
<tr>
<td>Pessimistic 30-Year Scenario</td>
<td>-2.2%</td>
<td>(2.2%)</td>
<td>4.0%</td>
<td>(4.5%)</td>
<td>-18.5%</td>
<td>1%</td>
<td>3.2%</td>
<td>5%</td>
<td>11%</td>
<td>159</td>
</tr>
<tr>
<td>Pessimistic 10-Year Scenario</td>
<td>-0.8%</td>
<td>(-1.0%)</td>
<td>5.4%</td>
<td>(6.2%)</td>
<td>-24%</td>
<td>-4%</td>
<td>1%</td>
<td>2.8%</td>
<td>8.9%</td>
<td>106</td>
</tr>
<tr>
<td>Pessimistic 5-Year Scenario</td>
<td>-8.3%</td>
<td>(-9.0%)</td>
<td>10.2%</td>
<td>(12.4%)</td>
<td>-59%</td>
<td>-14%</td>
<td>-7.2%</td>
<td>0.3%</td>
<td>8.9%</td>
<td>102</td>
</tr>
<tr>
<td>Pessimistic 1-Year Scenario</td>
<td>-19.2%</td>
<td>(-19.6%)</td>
<td>13.5%</td>
<td>(11.9%)</td>
<td>-39%</td>
<td>-29%</td>
<td>-24%</td>
<td>-9%</td>
<td>6.5%</td>
<td>72</td>
</tr>
</tbody>
</table>
Table IV

Univariate Statistics For Economists' Arithmetic Equity Premia Consensus Estimates

The table presents the distribution of economists' perception of the prevailing equity premia forecast. The surveys themselves are reproduced in the Appendix. The "S2" line reports only responses to the second survey; other lines report statistics from both surveys (after adjustments to first survey responses explained in Section III.A). Mean5 and Stddev5 are the mean and standard deviations after each series is truncated at its 5th and 95th percentile.

<table>
<thead>
<tr>
<th>Description</th>
<th>Mean5 (Mean)</th>
<th>Stddev5 (Stddev)</th>
<th>Min</th>
<th>Q1</th>
<th>Mdn</th>
<th>Q3</th>
<th>Max</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception 30-Year</td>
<td>7.6% (7.6%)</td>
<td>1.5% (1.7%)</td>
<td>1%</td>
<td>6.5%</td>
<td>7.8%</td>
<td>9%</td>
<td>12%</td>
<td>216</td>
</tr>
<tr>
<td>Perception 30-Year (S2)</td>
<td>7.5% (7.4%)</td>
<td>1.6% (1.9%)</td>
<td>1%</td>
<td>6%</td>
<td>7%</td>
<td>9%</td>
<td>12%</td>
<td>112</td>
</tr>
<tr>
<td>Perception 10-Year</td>
<td>8.1% (8.2%)</td>
<td>1.3% (1.4%)</td>
<td>4%</td>
<td>7%</td>
<td>8%</td>
<td>9%</td>
<td>12%</td>
<td>101</td>
</tr>
<tr>
<td>Perception 5-Year</td>
<td>7.7% (7.6%)</td>
<td>1.6% (1.7%)</td>
<td>1%</td>
<td>7%</td>
<td>8%</td>
<td>9%</td>
<td>11%</td>
<td>99</td>
</tr>
<tr>
<td>Perception 1-Year</td>
<td>6.0% (6.0%)</td>
<td>2.3% (2.4%)</td>
<td>0%</td>
<td>6%</td>
<td>7%</td>
<td>8%</td>
<td>12%</td>
<td>69</td>
</tr>
</tbody>
</table>
Table V
Statistics For Economists’ Arithmetic Equity Premia Consensus Estimates

The left side of the table presents the mean and standard deviation of economists’ arithmetic equity premia forecasts ($A_i$) and their perceptions of the prevailing equity premia consensus forecast ($C_i$), provided an individual supplied both an equity premium estimate and a consensus estimate for the same horizon. The right side provides OLS regression output when the demeaned arithmetic forecast ($\hat{A}_i - \bar{A}_i$) is regressed on this economist’s demeaned perception of the professional consensus about the same-horizon arithmetic forecast ($\hat{C}_i - \bar{C}_i$). The surveys themselves are reproduced in the Appendix. The “S2” line reports only responses to the second survey; other lines report statistics from both surveys (after adjustments to first survey responses explained in Section III.A).

<table>
<thead>
<tr>
<th>Description</th>
<th>Univariate Statistics, Common</th>
<th>$\hat{A}_i - \bar{A}_i = \alpha_0 + \alpha_1 (\hat{C}_i - \bar{C}_i) + e_i$</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\text{Mean}_A$</td>
<td>Stddev$_A$</td>
<td>$\text{Mean}_C$</td>
</tr>
<tr>
<td>30-Year</td>
<td>7.1%</td>
<td>1.9%</td>
<td>7.6%</td>
</tr>
<tr>
<td>30-Year (S2)</td>
<td>6.7%</td>
<td>2.1%</td>
<td>7.4%</td>
</tr>
<tr>
<td>10-Year</td>
<td>7.2%</td>
<td>1.8%</td>
<td>8.2%</td>
</tr>
<tr>
<td>5-Year</td>
<td>6.7%</td>
<td>2.3%</td>
<td>7.7%</td>
</tr>
<tr>
<td>1-Year</td>
<td>4.7%</td>
<td>4.2%</td>
<td>6.0%</td>
</tr>
</tbody>
</table>
Table VI

Questions on Issues Debated in Academic Finance

| Description                                                                 | Univariate Statistics | Response Count |
|                                                                           | Mean  | Stddev | #1 | #2 | #3 | #4 | #5 | Total |
| Q1 I believe that the true stock-market index's 3-5-year return autocorrelations are zero (random walk [ala Richardson, choose agree]), rather than negative (ala Fama-French, Shiller, choose disagree). | 2.85  | 1.1    | 7  | 42 | 17 | 31 | 5  | 102   |
| Q2 I believe that the CAPM is good enough an approximation of reality as to deserve use in capital budgeting contexts. | 3.41  | 1.1    | 5  | 22 | 19 | 51 | 13 | 110   |
| Q3 I believe that size/book-market/price-earnings/momentum power can explain cross-sectional returns primarily because they are risk factors (in the Fama-French sense) and not just firm characteristics (in the Daniel-Titman sense). | 2.64  | 1.2    | 18 | 33 | 19 | 20 | 7  | 97    |
| Q4 I believe that size/book-market/price-earnings/momentum factors are stationary enough, so that they will work well in the future in explaining cross-sectional expected return differences. | 2.77  | 1.0    | 9  | 37 | 24 | 26 | 3  | 99    |
| Q5 I believe that, by and large, public securities market prices are efficient. | 3.84  | 0.8    | 1  | 9  | 13 | 71 | 16 | 110   |
| Q6 I believe that, by and large, public securities market prices offer arbitrage opportunities. | 2.16  | 0.9    | 22 | 60 | 17 | 8  | 2  | 109   |
| Q7 I believe that, by and large, government regulation and intervention of public securities markets should be increased. (Please select middle if intervention should be held steady, and strongly disagree if intervention should be decreased.) | 2.13  | 0.8    | 29 | 39 | 40 | 0  | 1  | 109   |
| Q8 I believe that Fortune-500 U.S. corporations, by-and-large, have too little debt in their capital structure. | 3.09  | 1.0    | 4  | 26 | 23 | 30 | 6  | 89    |
| Q9 I believe that Fortune-500 U.S. corporations, by-and-large, should use share repurchases instead of dividends as payout means. | 3.68  | 1.0    | 4  | 7  | 21 | 42 | 18 | 92    |
Market Risk Premium ($E R_m - r_f$) Survey

Dear Colleague:

Please take 5 minutes to answer the questions in this survey. The first set of questions concern the market risk premium. It should take about 3 minutes of your time. The second set of questions concern such issues as "will the size/book-market/etc. characteristics continue to predict expected return characteristics?," and should take another 3 minutes. All survey questions pertain exclusively to the U.S. market.

I hope the consensus view on these questions will be of great interest to the finance profession. I am planning to publish an academic paper that summarizes the results of this survey.
Market Risk Premium

(Background Information: As of October 6, 1997, the S&P-500 stood at 965, the DJ stood at 8,040, the 30-year T-bond stood at 6.3%, the 3-month T-bill stood at 4.9%.)

Define the so-called "market risk premium" as your expected return on the SP500 minus the equivalent treasury bond, please give your opinion on the expected (forward-looking) annualized market risk premium. (Note: use this definition, even if this spread reflects factors other than risk. The famous Ibbotson "historical" equivalent is 8.2%) I would like your estimate of the future market risk premium, conditional today, i.e., beginning on the day on which you fill out the survey.

| Per-Annum Market Risk Premium: Exp. Return on SP500 MINUS Risk-Free Bond |
|--------------------------------------------------|------------------|------------------|------------------|------------------|
| **Total Return Translation Table**               | 1-year           | 5-year           | 10-year          | 30-year          |
| Your Expectation (Mean, Per-Annum)               | not necessary    | click here       | click here       | click here       |
| Your "Worst Case" (<5% prob), Per-Annum          |                  |                  |                  |                  |
| Your "Best Case" (<5% prob), Per-Annum           |                  |                  |                  |                  |
| Guess the academic finance profession's mean e.g., as expressed on this survey by other finance professors |                  |                  |                  |                  |

What percentage of their new retirement contributions would you advise a new finance colleague to put into stocks (rather than bonds)? %

I permit publication of my name as one in many in a list of participants with identification of my name with the risk premium choices above:  yes  no

I permit publication of my name as one in many in a list of participants, but I do not permit publication of my choices together with my name.  yes  no
Additional Questions

The following are 9 "optional" questions. Please answer them. They concern basic debates in finance today. If you do not like a particular question, or do not have a view on it, just leave it blank.

Remember: I am asking for your personal view, not whether a null hypothesis can be rejected with 95% probability!

I permit publication of my name as one in many in list of participants on the following questions:
(Unlike answers to the above questions, for which I requested permission to identify the respondent, the yes no answers to the questions below will be strictly anonymous and confidential.)

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Middle</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>No View</th>
</tr>
</thead>
<tbody>
<tr>
<td>I believe that the true stock-market index's 3-5-year return autocorrelations are zero (random walk [ala Richardson, choose agree]), rather than negative (ala Fama-French, Shiller, choose disagree).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe that the CAPM is good enough an approximation of reality as to deserve use in capital budgeting contexts.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe that size/book-market/ price-earnings/momentum power can explain cross-sectional returns primarily because they are risk factors (in the Fama-French sense) and not just firm characteristics (in the Daniel-Titman sense).</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe that size/book-market/ price-earnings/momentum factors are stationary enough, so that they will work well in the future in explaining cross-sectional expected return differences.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe that, by and large, public securities market prices are efficient.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe that, by and large, public securities market prices offer arbitrage opportunities.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe that, by and large, government regulation and intervention of public securities markets should be increased. (Please select middle if intervention should be held steady, and strongly disagree if intervention should be decreased.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe that Fortune-500 U.S. corporations, by-and-large, have too little debt in their capital structure.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe that Fortune-500 U.S. corporations, by-and-large, should use share repurchases instead of dividends as payout means.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Identification**

<table>
<thead>
<tr>
<th>Date</th>
<th>(Fill in only if printed, not if filled out via WWW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your Email Address:</td>
<td></td>
</tr>
<tr>
<td>Your Name:</td>
<td></td>
</tr>
</tbody>
</table>
| Professional Status: | C Professor  
C PhD Student  
C MBA Student |
| PhD Graduate  
C MBA Graduate  
C Other |
| Area: | C Finance  
C Accounting |
| C Economics  
C Other |
| Primary specialization: | C Asset-Pricing - Empirical  
C Asset-Pricing - Theory  
C Asset-Pricing - Both  
C Asset-Pricing - Derivatives  
C Asset-Pricing - Fixed Income |
| C Corporate Finance  
C Market  
Microstructure  
C Other Empirical  
C Other Theoretical  
C Other |

Feel free to comment, but please note that you should instead send me email about this survey if you think I have made a mistake (or that I could do the survey better). I will not see these comments until I tabulate the surveys.

Please do not forget to check your own WWW and email entries in the directory: [http://linux.agsm.ucla.edu/dir/](http://linux.agsm.ucla.edu/dir/) (or to look up anyone of your choice). For feedback about this website, please send email to ivo.welch@anderson.ucla.edu. To get back to the home page, click homepage.
Dear Colleague:

Please take a moment to answer the 5 primary questions in this survey (and to input your email address). After you have filled out the form, please press the "submit" button at the end of the page.

The distribution of answers to this survey will be published in an academic paper, possibly in the Journal of Finance. Your identity will be strictly confidential, i.e., it will not be released or published anywhere, much less jointly with your estimates.

The following 5 questions revolve around 30-year forecasts of the equity premium and the stock market. For your convenience, equivalent historical averages, published by Ibbotson, for the 1926-1997 period are in the right-most column of the table. Please enter percentages without "%". PLEASE send email if you encounter difficulties.

<table>
<thead>
<tr>
<th>Please Fill In</th>
<th>Requested (30 year forecast)</th>
<th>Long Definition all over the next 30 years</th>
<th>Historical Ibbotson</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stock Market (S&amp;P) Arithmetic Per-Annun Rate of Return, Nominal</td>
<td>Your expected arithmetic per-annum return on the stock market (e.g., the S&amp;P500) over the next 30 years. If unclear, click for mathematical definition.</td>
<td>13.0%*</td>
</tr>
<tr>
<td>2</td>
<td>Equity Premium, Arithmetic Per-Annun Average Rate</td>
<td>Your expected arithmetic per-annum average return over the next 30 years on: the stock market (S&amp;P500) return minus the arithmetic per-annum average return on rolled-over 30-day T-bills. If unclear, click for mathematical definition.</td>
<td>9.2%*</td>
</tr>
<tr>
<td>3</td>
<td>Equity Premium, Geometric Per-Annun Average Rate</td>
<td>Your expected geometric per-annum average return over the next 30 years on: the stock market (S&amp;P500) return net of the geometric per-annum average return on rolled-over 30-day T-bills. If unclear, click for mathematical definition.</td>
<td>6.9%*</td>
</tr>
<tr>
<td>4</td>
<td>Other Economists’ Forecasts of Equity Premium, Arithmetic Average, 30 Years</td>
<td>What do you think will be the average answer of other economists to this survey’s Question 2?</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Decrease it very slightly (neg feedback)</td>
<td>Presume that the stock market closed up much higher today, while interest rates remained constant. On the margin, how would today’s positive stock market return influence your forecast of the 30-year arithmetic equity premium tomorrow?</td>
<td></td>
</tr>
</tbody>
</table>
Ibbotson data are computed from 1926 to 1997 means, and provided only for calibration purposes---these numbers clarify comparables to finance professors familiar with the basic series. They are not guaranteed to be correct---please contact Ibbotson Associates for definite and up-to-date numbers.
Mathematical Definitions of Requested Expectations

Question 1: Stock Market Return, Nominal, Arithmetic Average, 30 Year Horizon
Your expectation for the arithmetic stock market return (ASMR):

\[ \text{ASMR}(30) = \left( \frac{1}{30} \right) \cdot \sum_{y=1}^{30} mr_y \]

where \( mr_y \) is the (unknown) one-year stock market return in \( y \) years. (Note also that all stock market related questions do not request the performance of stocks as constituted in the current S&P index, but the performance of stocks in the then-prevailing S&P in the future.) click here for more details on requested time frame.

Question 2: Equity Premium, Arithmetic Average, 30 Year Horizon
Your expectation for the arithmetic equity premium (AEQP):

\[ \text{AEQP}(30) = \left( \frac{1}{30} \right) \cdot \sum_{y=1}^{30} (mr_y - tbr_y) \]

where \( mr_y \) is the (unknown) one-year stock market return in \( y \) years, and \( tbr_y \) is the (unknown) one-year return on rolled-over short-term (30-day) treasury bonds in \( y \) years. click here for more details on requested time frame.

Question 3: Equity Premium, Geometric Average, 30 Year Horizon
Your expectation for the geometric equity premium (GEQP):

\[ \text{GEQP}(30) = \frac{\text{GSMR}(30)}{\text{GTBR}(30)} \]

\[ \text{GSMR}(P) = \left( \prod_{y=1}^{P} (1 + mr_y) \right)^{\frac{1}{P}} \]
\[ \text{GTBR}(P) = \left( \prod_{y=1}^{P} (1 + tbr_y) \right)^{\frac{1}{P}} \]

where \( mr_y \) is the (unknown) one-year stock market return in \( y \) years, and \( tbr_y \) is the (unknown) one-year return on rolled-over short-term (30-day) treasury bonds in \( y \) years. click here for more details on requested time frame.

Questions 7-10: Equity Premium, Arithmetic Average, Different Horizons
Your expectation for

\[ \text{AEQP}(P) = \left( \frac{1}{P} \right) \cdot \sum_{y=1}^{P} (mr_y - tbr_y) \]

where \( P=1 \) in question 7, \( P=5 \) in question 8, \( P=10 \) in question 9, and \( P=100 \) in question 10. As above, \( mr_y \) is the (unknown) annual stock market return in \( y \) years, and \( tbr_y \) is the (unknown) annual return on rolled-over short-term (30-day) treasury bonds in \( y \) years. click here for more details on requested time frame.

Question 13: 30-Year Inflation, Arithmetic Average
Your expectation for
where \( i_y \) is the (unknown) annual inflation rate "in \( y \) years." Click here for more details on requested time frame.

**Timing Details**

The 30-year questions ask you for your forecasts from tomorrow through 30 years after tomorrow. Thus, if you answered this questionnaire on 12/31/1998, the 30-year questions asks you for annualized forecasts using returns from 1/1/1999 to 12/31/2028—i.e., from 1999 (inclusive) through 2028 (inclusive). Note also that within each year, the returns are compounded (not averaged), even if the requested average is arithmetic.

Similarly, if you answered this questionnaire on Dec 31, 1998, the 1-year forecast question 7 asks you for your forecast for 1999, and the 100-year forecast question 10 asks you for your forecast from 1999 (inclusive) through 2028 (inclusive).