The Equity Risk Premium in 2010

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ABSTRACT

We analyze the history of the equity risk premium from surveys of U.S. Chief Financial Officers (CFOs) conducted every quarter from June 2000 to June 2010. The risk premium is the expected 10-year S&P 500 return relative to a 10-year U.S. Treasury bond yield. While the risk premium sharply increased during the financial crisis peaking in February 2009, the current surveys show that the premium has returned to levels observed in late 2006 and early 2007. The survey also provides measures of cross-sectional disagreement about the risk premium, skewness, and a measure of individual uncertainty. While disagreement has decreased from peak levels, the level of disagreement is still historically high suggesting considerable uncertainty. We also present evidence on the determinants of the long-run risk premium. Our analysis suggests the level of the risk premium closely tracks both market volatility (reflected in the VIX index) as well as credit spreads.

JEL Classification: *G11, G31, G12, G14*

Keywords: *Cost of capital, financial crisis, equity premium, long-term market returns, long-term equity returns, expected excess returns, disagreement, individual uncertainty, skewness, asymmetry, survey methods, risk and reward, TIPs, VIX, Credit spreads*

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1. Introduction

We analyze the results of the most recent survey of Chief Financial Officers (CFOs) conducted by Duke University and *CFO* Magazine. The survey closed on June 4, 2010 and measures expectations beginning in the third quarter of 2010. In particular, we poll CFOs about their long-term expected return on the S&P 500. Given the current 10-year T-bond yield, we provide estimates of the equity risk premium and show how the premium changes through time. We also provide information on the disagreement over the risk premium as well as average confidence intervals.

2. Method

2.1 Design

The quarterly survey of CFOs was initiated in the third quarter of 1996.[1] Every quarter, Duke University polls financial officers with a short survey on important topical issues (Graham and Harvey, 2009). The usual response rate for the quarterly survey is 5%-8%. Starting in June of 2000, a question on expected stock market returns was added to the survey. Fig. 1 summarizes the results from the risk premium question. While the survey asks for both the one-year and ten-year expected returns, we focus on the ten-year expected returns herein, as a proxy for the market risk premium.

The executives have the job title of CFO, Chief Accounting Officer, Treasurer, Assistant Treasurer, Controller, Assistant Controller, or Vice President (VP), Senior VP or Executive VP of Finance. Given that the overwhelming majority of survey respondents hold the CFO title, for simplicity we refer to the entire group as CFOs.

2.2 Delivery and response

In the early years of the survey, the surveys were faxed to executives. The delivery mechanism was changed to the Internet starting with the December 4, 2001 survey. Among other things, we now collect the respondents' IP addresses (though not their identity or company) and are able examine consistency of responses across different surveys. Respondents are given four business days

[1] The surveys from 1996Q3-2004Q2 were partnered with a national organization of financial executives. The 2004Q3 and 2004Q4 surveys were solely Duke University surveys, which used Duke mailing lists (previous survey respondents who volunteered their email addresses) and purchased email lists. The surveys from 2005Q1 to present are partnered with *CFO Magazine*. The sample includes both the Duke mailing lists and the *CFO* subscribers that meet the criteria for policy-making positions.

to fill out the survey, and then a reminder is sent allowing another four days. Usually, two-thirds of the surveys are returned within two business days.

The response rate of 5-8% could potentially lead to a non-response bias. There are five reasons why we are not overly concerned with the response rate. First, our response rate is within the range that is documented in many other survey studies. Second, Graham and Harvey (2001) conduct a standard test for non-response biases (which involves comparing the results of those that fill out the survey early to the ones that fill it out late) and find no evidence of bias. Third, Brav, Graham, Harvey and Michaely (2005) conduct a captured sample survey at a national conference in addition to an Internet survey. The captured survey responses (to which over two-thirds participated) are qualitatively identical to those for the Internet survey (to which 8% responded), indicating that non-response bias does not significantly affect their results. Fourth, Brav et al. contrast survey responses to archival data from Compustat and find archival evidence for the universe of Compustat firms that is consistent with the responses from the survey sample. Fifth, Campello, Graham, and Harvey (2010) show that the December 2008 response sample is fairly representative of the firms included in the commonly used Compustat database.

2.3 Data integrity

In each quarter, we trim the top two and bottom two risk premium observations. Given that we have, on average, 333 responses each quarter, this implies a less than 1% trim in each of the tails. In addition, of the over 11,000 survey observations, there was only a single observation (in the June 2000 survey) that we consider not credible. The trimmed and untrimmed data are very similar with the exception of the June 2000 survey.

There are two other steps that we take. First, for the purpose of some of our statistics, we require that the expected risk premium forecast be no more than the best-case scenario and no less than the worst-case scenario. If the ordering is violated, then the observation is deleted. Second, there are a few instances in which respondents report in decimals rather than percentages. In these cases, we change the inputs to adhere to the survey format rather than deleting the observations.

2.4 The 2010 results

The expected market return questions are a subset of a larger set of questions in the quarterly survey of CFOs. The survey usually contains between eight and ten questions. Some of the questions are repeated every quarter and some change through time depending on economic conditions. The historical surveys can be accessed at http://www.cfosurvey.org. Appendix 1 shows the risk premium question in the most recent survey.

While the survey is anonymous, we collect demographic information on seven firm characteristics, including industry, sales revenue, number of employees, headquarters location, ownership (public or private), and proportion of foreign sales.

During the past ten years, we have collected 13,668 responses to the survey. Panel A of Table 1 presents the date that the survey window opened, the number of responses for each survey, the 10-year Treasury bond rate, as well as the average and median expected excess returns. There is relatively little time variation in the risk premium. This is confirmed in Fig. 1, which displays the historical risk premiums contained in Table 1. The current premium, 3.00%, is considerably lower than the peak premium of 4.74% observed in February 2009. The June 2010 survey shows that the expected annual S&P 500 return is 6.31% and the implied risk premium is 3.00% (6.31-3.31).[2] The expected annual S&P 500 return is the lowest observed in the history of the survey.

Panel B of Table 1 presents some summary statistics that pool all 13,668 responses. The overall average ten-year risk premium return is 3.40%.[3] The standard deviation is 3.25%.

The cross-sectional standard deviation across the individual CFO forecasts in a quarter is a measure of the disagreement of the participants in each survey. Disagreement sharply increased during the global financial crisis. The average disagreement in 2005 was 2.38%. Disagreement increased in 2006 to 2.42%. As the crisis began in 2007, disagreement increased to 2.56. In 2008, the

[2] See, for example, Ghysels (1998), Welch (2000, 2001, 2009), Ghysels (1998), Fraser (2001), Harris and Marston (2001), Pástor and Stambaugh (2001), Fama and French (2002), Goyal and Welch (2003), Graham and Harvey (2003), Ang and Bekaert (2005), Fernandez (2004, 2006, 2009) for studies of the risk premium.

[3] Using the Ibbotson Associates data from January 1926 through July 2010, the arithmetic (geometric) average return on the S&P 500 over and above the 30-day U.S. Treasury bill is 7.75% (5.80%). Using data from April 1953-July 2010, the arithmetic (geometric) risk premium is 6.27% (5.12%). The risk premium over the 10 year bond should be reduced by 212 basis points for the arithmetic premium and 174 basis points for the geometric premium. Fama and French (2002) study the risk premium on the S&P 500 from 1872-2000 using fundamental data. They argue that the ex ante risk premia is between 2.55% and 4.32% for 1951-2000 period. Ibbotson and Chen (2001) estimate a long-term risk premium

level of disagreement increased to 2.75%. The peak disagreement was recorded in 2009 (average 3.34% and second quarter was 4.74%). The most recent observation is 3.07% which is lower than 2009 but higher than before the crisis. Indeed, the only years with disagreement above 3% are 2009 and 2010.

We also report information on the average of the CFOs' assessments of the one in ten chance that the market will exceed or fall below a certain level. In the most recent survey, the worst case total return is 0.36% which is the second lowest observation (the lowest being the February 2010 survey). The best-case return is 10.58%.

With information on the 10% tails, we construct a probability distribution for each respondent. We use Davidson and Cooper's (1976) method to recover each respondent's probability distribution:

$$\text{Variance} = ([x(0.90)-x(0.10)]/2.65)^2$$

where $x(0.90)$ and $x(0.10)$ represent the 90th and 10th percentiles of the respondent's distribution. Keefer and Bodily (1983) show that this simple approximation is the preferred method of estimating the variance of a probability distribution of random variables, given information about the 10th and 90th percentiles. Like disagreement, the average of individual volatilities peaked in February 2009. The current level, 3.86%, is elevated and higher than the average during 2009. This reinforces the considerable uncertainty about economic prospects.

There is also a natural measure of asymmetry in each respondent's response. We look at the difference between each individual's 90% tail and the mean forecast and the mean minus the 10% tail. Hence, if the respondent's forecast of the excess return is 6% and the tails are -8% and +11%, then the distribution is negatively skewed with a value of -9% (=5%-14%). As with the usual measure of skewness, we cube this quantity and standardize by dividing by the cube of the individual standard deviation. In every quarter's survey, there is on average negative skewness in the individual forecasts. The average asymmetry became more negative at -0.63 which is the second lowest ever recorded (lowest is February 2010).

Overall, the survey points to: (a) reduction in the risk premium from peak levels, (b) record low total market returns, and (c) near record levels of uncertainty.

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between 4 and 6%. Also see Siegel (1999), Asness (2000), Heaton and Lucas (2000) and Jagannathan, McGratten and Scherbina (2001).

Table 1
Summary statistics based on the responses from the 41 CFO Outlook Surveys from June 2000 to June 2010

A. By quarter

Survey date	Survey for	Number of survey responses	10-year bond yield	Average risk premium	Median risk premium	Disagreement (standard deviation of risk premium estimates)	Average of individual standard deviations	Average of individuals' worst 10% market return scenario	Average of individuals' best 10% market return scenario	Skewness of risk premium estimates	Average of individuals' asymmetry
6-Jun-00	2000Q3	206	6.10	4.35	3.9	2.99				0.81	
7-Sep-00	2000Q4	184	5.70	4.65	4.3	2.70				0.49	
4-Dec-00	2001Q1	239	5.50	4.20	4.5	2.31				0.37	
12-Mar-01	2001Q2	137	4.90	4.46	4.1	2.59				0.38	
7-Jun-01	2001Q3	204	5.40	3.79	3.6	2.43				0.49	
10-Sep-01	2001Q4	198	4.80	3.77	3.2	2.53				-0.11	
4-Dec-01	2002Q1	275	4.70	3.98	3.3	2.34				0.66	
11-Mar-02	2002Q2	234	5.30	2.88	2.7	2.17	3.21	3.66	12.23	0.30	-0.28
4-Jun-02	2002Q3	321	5.00	3.18	3.0	2.59	3.41	3.11	12.15	1.96	-0.39
16-Sep-02	2002Q4	363	3.90	4.00	4.1	2.27	3.36	3.10	12.01	1.03	-0.25
2-Dec-20	2003Q1	283	4.20	3.71	3.8	2.39	3.19	3.38	11.83	1.31	-0.28
19-Mar-03	2003Q2	180	3.70	3.66	3.3	2.12	3.57	1.92	11.40	0.49	-0.60
16-Jun-03	2003Q3	368	3.60	3.89	4.4	2.34	3.74	2.17	12.07	0.89	-0.33
18-Sep-03	2003Q4	165	4.30	3.21	3.7	1.87	2.80	3.34	10.78	-0.02	-0.42
10-Dec-03	2004Q1	217	4.36	3.83	3.6	2.22	3.24	3.35	11.94	0.74	-0.46
24-Mar-04	2004Q2	202	3.70	4.10	4.3	2.06	3.46	2.84	12.00	-0.03	-0.28
16-Jun-04	2004Q3	177	4.75	3.04	3.3	2.28	3.06	3.11	11.20	0.96	-0.39
12-Sep-04	2004Q4	177	4.25	3.24	3.3	2.32	3.13	2.70	10.98	0.64	-0.47
5-Dec-04	2005Q1	291	4.35	3.20	3.2	2.63	3.00	3.16	11.10	2.01	-0.36
28-Feb-05	2005Q2	275	4.28	3.19	3.2	2.47	2.99	3.23	11.16	1.49	-0.32
31-May-05	2005Q3	318	4.07	2.98	2.9	2.21	3.17	2.50	10.88	0.50	-0.25
29-Aug-05	2005Q4	325	4.20	2.93	2.8	2.20	3.23	2.26	10.82	0.96	-0.50
21-Nov-05	2006Q1	342	4.52	2.39	2.5	2.14	3.40	2.35	11.38	0.57	-0.23
6-Mar-06	2006Q2	278	4.61	2.57	2.4	2.37	3.43	2.11	11.18	1.11	-0.36
1-Jun-06	2006Q3	500	5.05	2.69	3.0	2.69	3.26	3.10	11.70	2.00	-0.23
11-Sep-06	2006Q4	465	4.79	2.50	2.2	2.47	3.29	2.57	11.28	1.37	-0.32
21-Nov-06	2007Q1	392	4.58	3.21	3.4	2.92	3.31	2.98	11.75	1.93	-0.29
1-Mar-07	2007Q2	388	4.55	3.13	3.5	2.39	3.31	2.79	11.56	1.83	-0.38
1-Jun-07	2007Q3	419	4.90	2.94	3.1	2.12	3.20	3.10	11.58	0.61	-0.38
7-Sep-07	2007Q4	486	4.48	3.35	3.5	2.81	3.08	3.39	11.54	1.80	-0.33
1-Dec-07	2008Q1	465	4.04	3.78	4.0	2.73	3.25	2.99	11.60	1.47	-0.32
7-Mar-08	2008Q2	388	3.61	3.97	4.4	2.97	3.16	3.11	11.50	2.28	-0.29
13-Jun-08	2008Q3	390	4.15	3.12	2.9	2.72	3.28	2.49	11.20	2.02	-0.41
5-Sep-08	2008Q4	439	3.69	3.53	3.3	2.59	3.22	2.37	10.90	1.05	-0.41
28-Nov-08	2009Q1	545	3.10	4.12	3.9	3.10	3.66	1.77	11.47	1.66	-0.36
26-Feb-09	2009Q2	452	2.75	4.74	4.3	4.11	4.23	1.27	12.40	1.82	-0.47
29-May-09	2009Q3	440	3.29	3.57	3.7	3.14	3.65	1.41	11.07	1.74	-0.40
11-Sep-09	2009Q4	546	3.37	3.05	2.6	3.00	3.84	0.60	10.76	1.23	-0.45
11-Dec-09	2010Q1	460	3.47	3.23	2.5	3.55	3.83	0.67	10.85	2.41	-0.52
26-Feb-10	2010Q2	485	3.69	2.79	2.3	3.39	3.94	0.34	10.77	1.82	-0.67
4-Jun-10	**2010Q3**	**449**	**3.31**	**3.00**	**2.7**	**3.07**	**3.86**	**0.36**	**10.58**	**2.62**	**-0.63**
Average of quarters		333	4.32	3.46	3.38	2.59	3.38	2.46	11.40	1.16	-0.38
Standard deviation			0.74	0.59	0.63	0.45	0.31	0.93	0.49	0.72	0.11

B. By individual responses

Survey for										
All dates	13,668	3.40	3.25	2.78	3.54	2.49	11.47	1.61	-0.34

2.5 Recessions, the financial crisis and risk premia

Our survey now spans two recessions: March 2001-September 2001 as well as the recession that begins in December 2007. Financial theory would suggest that risk premia should vary with the

business cycle. Premiums should be highest during recessions and lowest during recoveries. Previous research has used a variety of methods including looking at ex post realized returns to investigate whether there is business-cycle like variation in risk premia.

While we only have 41 observations and this limits our statistical analysis, we do see important differences. During recessions, the risk premium is 3.57% and during non-recessions, the premium falls to 3.31%. This analysis assumes that the current recession ended in August 2009.

The recession that began in December 2007 is a much worse than normal recession. For example, the recession of 2001 was relatively mild and lasted only three quarters. The current recession is already double the length and includes some of the highest unemployment since the second world war. Nevertheless, the risk premium is not really much different during this recession than during the 2001 recession.

2.6 Interviews

To further explore the risk premium, we conduct brief interviews on the topic of the cost of capital and the risk premium to understand the question that CFOs believe they are answering. We conducted 12 interviews over the 2003-2005 period.[4] We gain a number of insights from the interviews. There is remarkable consistency in the CFOs' views.

First, the CFOs closely track both their company's stock and the market. They are often called upon internally (e.g., Board of Directors) or externally (analyst conference calls) to explain their company's stock price. As a result, they need to try to separate out the systematic and idiosyncratic variation in their company's stock returns. To do this, they attempt to understand the forces that might cause systematic variation in the market.

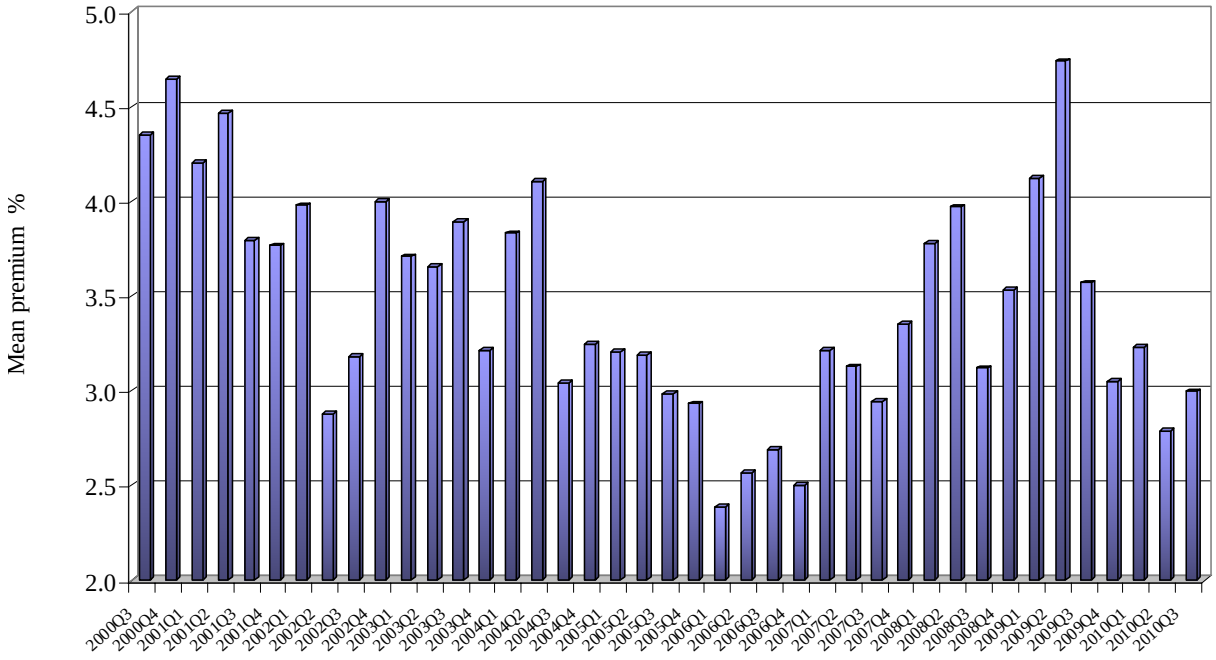
Second, the CFOs believe that the "risk premium" is a longer-term measure of expected excess returns and best covered by our question on the expected excess return over the next ten years – rather than the one-year question. Three-fourths of the interviewees use a form of the Capital Asset Pricing Model (which is consistent with the evidence in Graham and Harvey, 2001). They use a measure of the risk premium in their implementation of the CAPM. Often their 10-year risk

[4] Three of these interviews exclusively focused on the risk premium question. Eight interviews were non-exclusive and based on surplus time available in the interviews in Brav et al. (2005) and Graham, Harvey and Rajgopal (2005). The remaining interview was conducted in 2005.

premium is supplemented so that that company's hurdle rate exceeds their expected excess return on the S&P 500. Also, while not specified in the question, CFOs interpret the 10-year expected market return as the return to a buy-and-hold strategy. As a result, our survey measures the geometric rather than arithmetic average return.

Figure 1

10-year forecasted S&P 500 returns over and above the 10-year Treasury bond yield

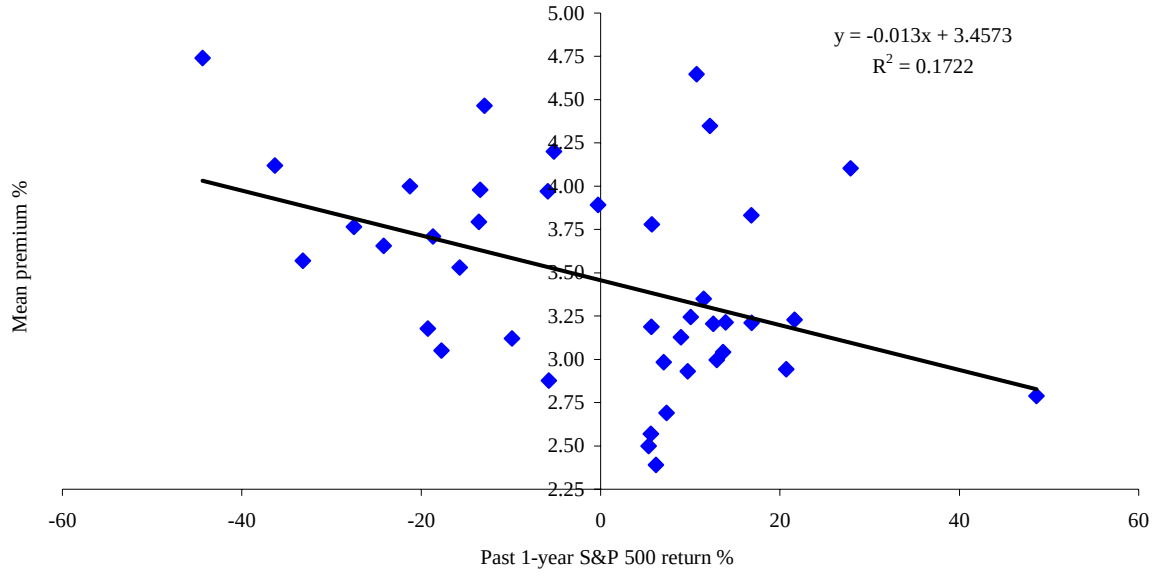


2.7 Explaining variation in the risk premium

While we document the level and a limited time-series of the long-run risk premium, statistical inference is complicated by the fact that the forecasting horizons are overlapping. First, we have no way of measuring the accuracy of the risk premiums as forecasts of equity returns. Second, any inference based on regression analysis is confounded by the fact that from one quarter to the next, there are 38 common quarters being forecasted. This naturally induces a moving-average process.

We do, however, try to characterize the time-variation in the risk premium without formal statistical tests. Figure 2 examines the relation between the mean premium and previous one-year returns on the S&P 500.

Figure 2
The equity risk premium and past 1-year returns on the S&P 500 index

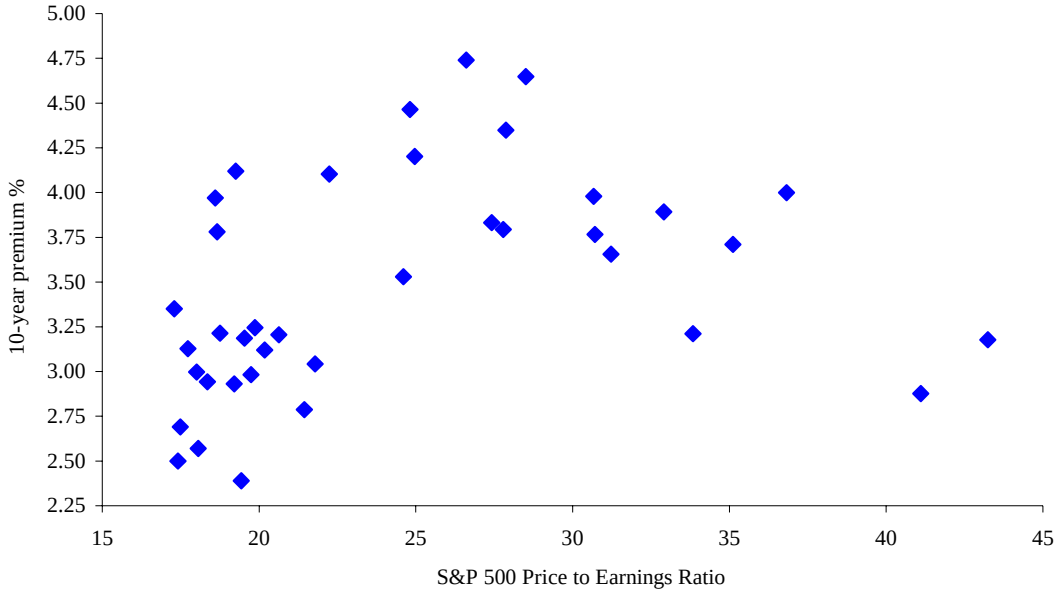


The evidence suggests that there is a weak negative correlation between past returns and the level of the long-run risk premium. This makes economic sense. When prices are low (after negative returns), expected return increase.

An alternative to using past-returns is to examine a measure of valuation. Figure 3 examines a scatter of the mean premium versus the price-to-earnings ratio of the S&P 500.

Figure 3a

The equity risk premium and the S&P 500 price-to-earnings ratio: full sample



Looking at the data in Figure 3a, it appears that the inference is complicated by a non-linear relation. At very high levels of valuation, the expected return (the risk premium) was low. Figures 3b and 3c show the relation split by a PE level of 25. In all three graphs, three observations are excluded with PE ratio of 85, 123 and 130.

Figure 3b

The equity risk premium and the S&P 500 price-to-earnings ratio when PE<25

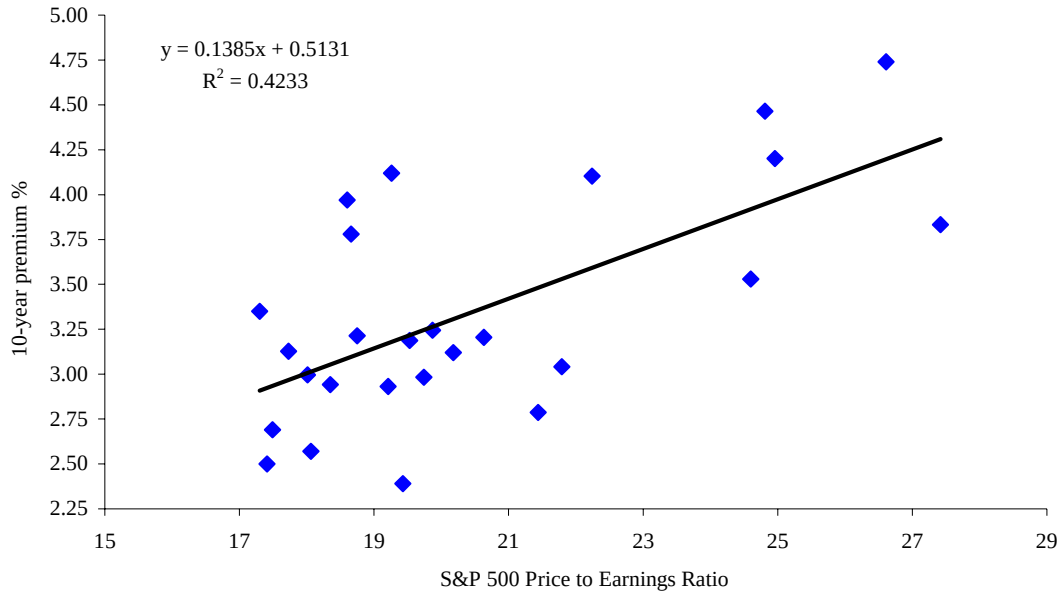
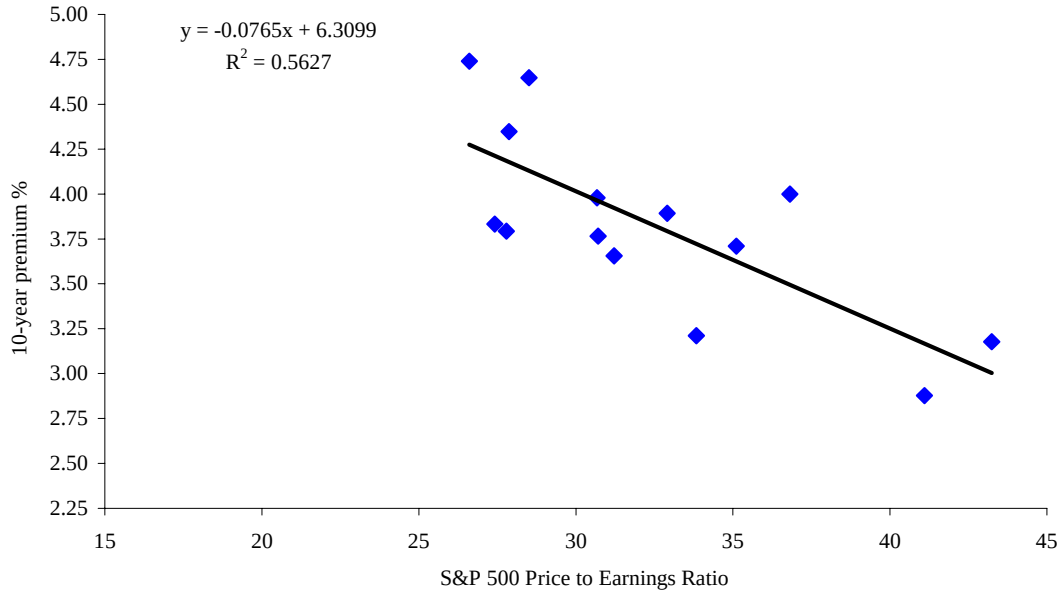


Figure 3c

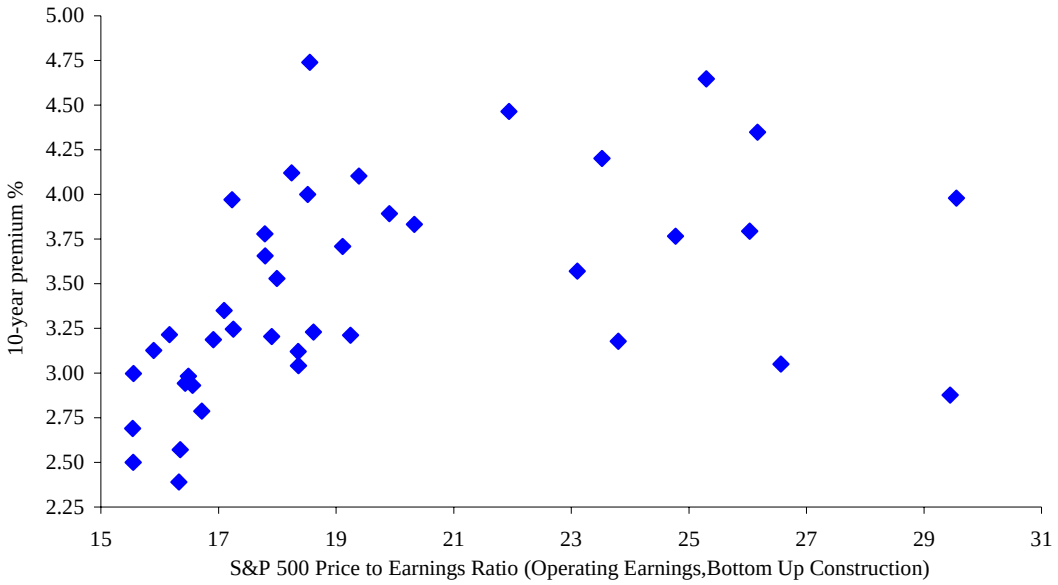
The equity risk premium and the S&P 500 price-to-earnings ratio when PE>25



The non-linear relation is not a quirk of the PE ratio that we use. Figure 3d uses the forward and actual P/E ratios that S&P constructs from bottom up data. There are no observations excluded in this graph.

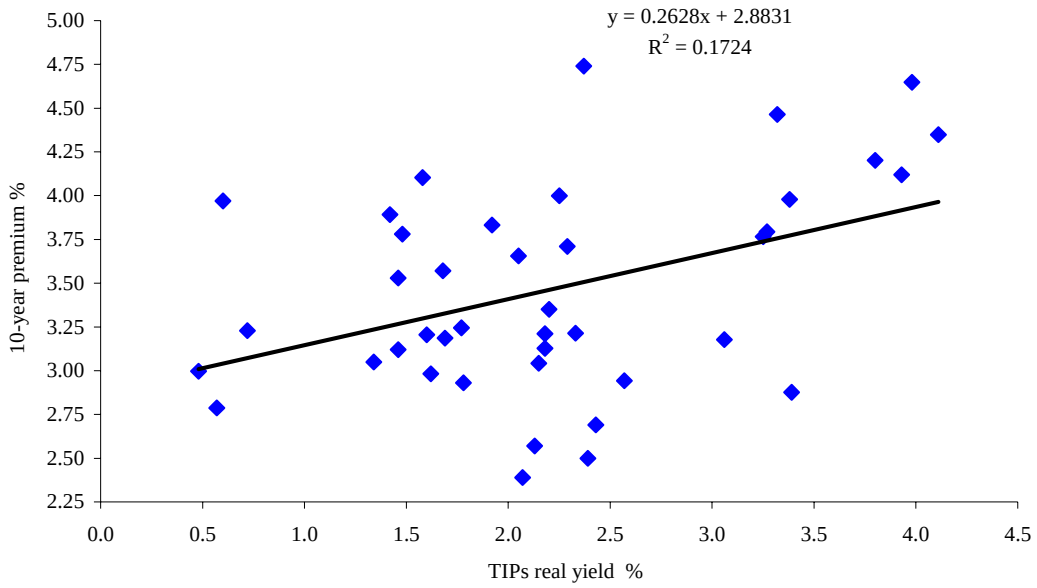
Figure 3d

The equity risk premium and the S&P 500 forward and actual price-to-earnings ratio: full sample



We also examine the real yield on Treasury Inflation Indexed Notes. The risk premium is like an expected real return on the equity market. It seems reasonable that there could be a correlation between expected real rates of return stocks and bonds. Figure 4 examines the 10-year on the run yield on the Treasury Inflation Indexed Notes.

Figure 4
The equity risk premium and the real yield on Treasury Inflation Indexed Notes

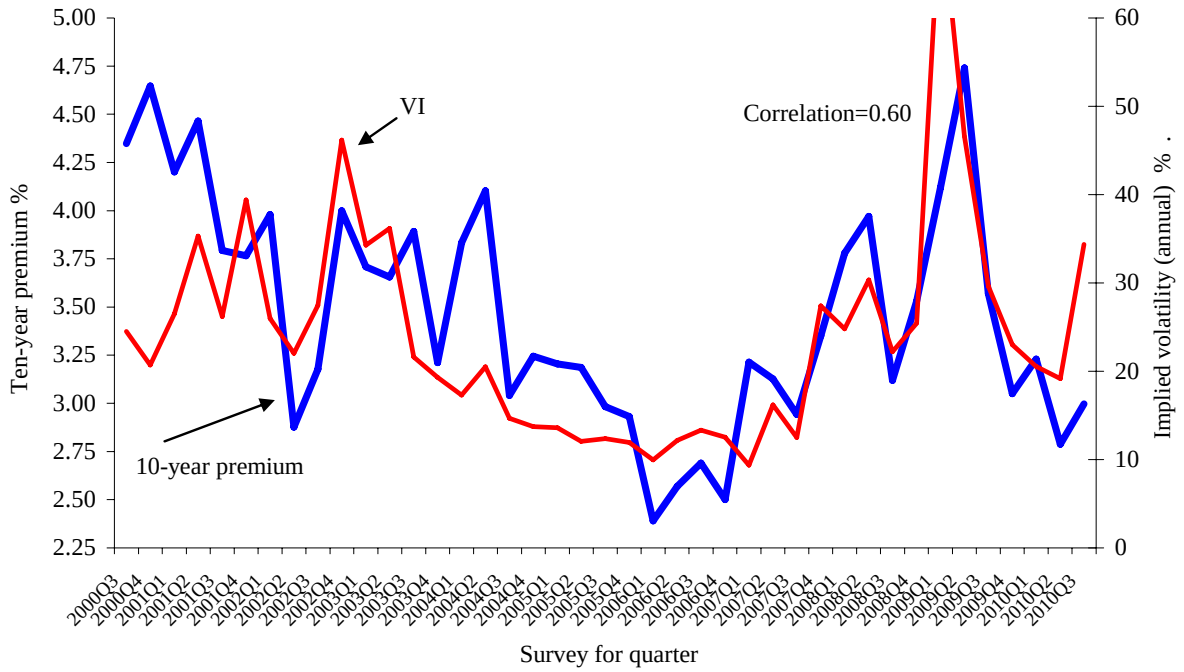


In this case, there is a weak positive correlation. Lower TIPS yields are associated with lower equity risk premiums. However, the analysis is only suggestive that the long-run equity premium and real interest rates move together.

Finally, we consider two measures of risk and the risk premium. Figure 5 shows that over our sample there is evidence of a strong positive correlation between market volatility and the long-term risk premium. We use a five-day moving average of the implied volatility on the S&P index option (VIX) as our volatility proxy. The correlation between the risk premium and volatility is 0.60. If the closing day of the survey is used, the correlation is roughly the same. Asset pricing theory suggests that there is a positive relation between risk and expected return. While our volatility proxy doesn't match the horizon of the risk premium, the evidence, nevertheless, is suggestive of a positive relation.

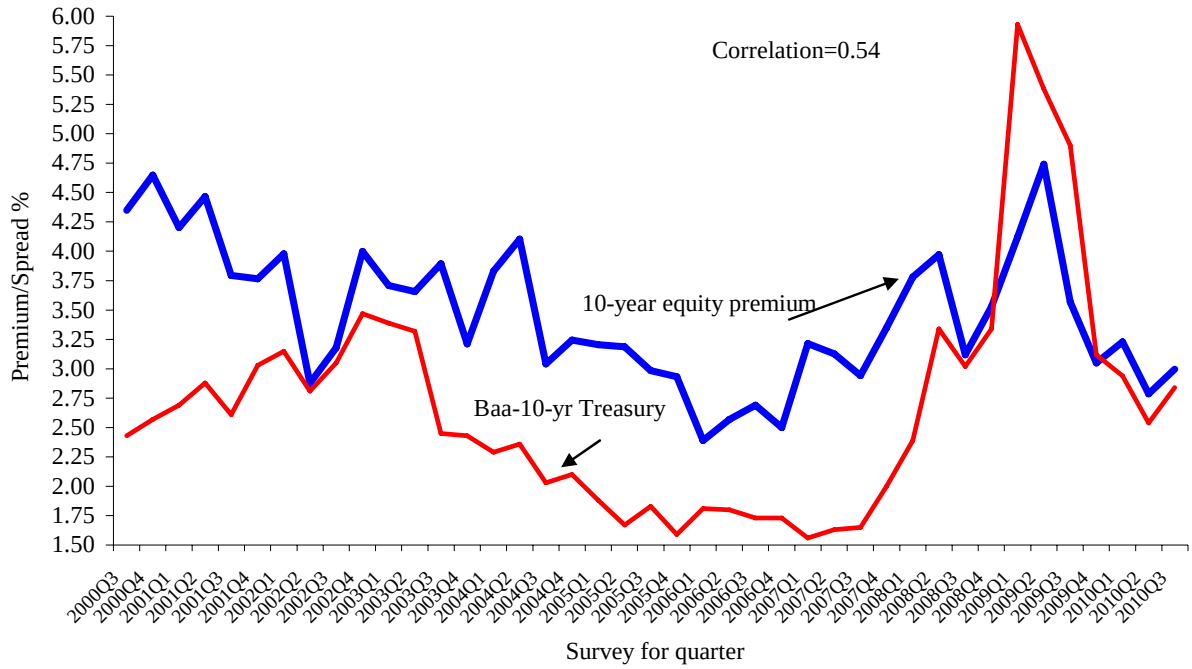
Figure 5

The equity risk premium and the implied volatility on the S&P 500 index option (VIX)



We also consider an alternative risk measure, the credit spread. We look at the correlation between Moody's Baa rated bond yields less the 10-year Treasury bond yield and the risk premium. Figure 6 shows a highly significant relation between the time-series with a correlation of 0.54.

Figure 6
The equity risk premium and credit spreads



2.8 Other survey questions

The June 2010 survey contains a number of other questions. http://www.cfosurvey.org presents the full results of these questions. The site also presents results conditional on demographic firm characteristics. For example, one can examine the CFOs views of the risk premium conditional on the industry in which the CFO works.

2.9 Risk premium data and corporate policies

New research by Ben-David, Graham and Harvey (2010) uses the one-year risk premium forecasts as a measure of optimism and the 80% confidence intervals as a direct measure of overconfidence. By linking email addresses that respondents provide to archival corporate data, Ben-David et al. find that the tightness of the confidence intervals is correlated with corporate investment. Overconfident managers invest more.

Campello, Graham and Harvey (2010) use the survey during the financial crisis and the higher risk premiums to examine the implications of financial constraints on the real activities of the firm. They provide new evidence on the negative impact of financial constraints on firms' investment plans.

Campello, Giambona, Graham and Harvey (2010) use the survey during to study how firms managed liquidity during the financial crisis.

Graham, Harvey and Puri (2010a) administer a psychometric test using the survey instrument and link CEO optimism and risk aversion to corporate financial policies.

Graham, Harvey and Puri (2010b) use survey data to study how capital is allocated within the firm and the degree to which CEOs delegate decision making to CFOs.

2.10 CFO Survey compared to other surveys

Table 2 compares the predictive ability of the Duke-CFO survey with other popular surveys. The table reports the correlations between the current quarter Duke-CFO survey of either optimism about the economy or optimism about the firm's prospects with the subsequent quarter's realization for five surveys: UBS-Gallup, CEO Survey, Conference Board Consumer Confidence, University of Michigan Consumer Confidence and ISM Purchasing Manager's Index. Both of the Duke-CFO optimism measures significantly predict all five of these popular barometers of economic confidence. Related analysis shows that our CFO survey anticipates economic activity sooner (usually one quarter sooner) than do the other surveys.

Table 2
The ability of the Duke CFO survey to predict other surveys

	Predictive correlations	
Survey	Optimism about economy	Optimism about firm's prospects
UBS-Gallup	0.289	0.380
CEO Survey	0.814	0.824
Conference Board Consumer Confidence	0.513	0.767
University of Michigan Consumer Confidence	0.341	0.253
ISM Purchasing Managers Index	0.694	0.497

3. Conclusions

We provide a direct measure of ten-year market returns based on a multi-year survey of Chief Financial Officers. Importantly, we have a 'measure' of expectations. We do not claim it is the true market expectation. Nevertheless, the CFO measure has not been studied before.

While there is relatively little time-variation in the risk premium, a number of patterns emerge. We offer evidence that the risk premium is higher during recessions and non-recessions. Given the recent global economic crisis, the risk premium has hit a record high for our ten years of surveys. We also present evidence on disagreement. With higher disagreement, people often have less confidence in their forecasts. While the risk premium has decreased since the peak during the crisis, our measures of disagreement are still elevated suggesting considerable uncertainty persists.

While we have 13,668 survey responses over 10 years, much of our analysis uses summary statistics for each survey. As such, with only 41 unique quarters of predictions and a variable of interest that has a 10-year horizon, it is impossible to evaluate the accuracy of the market excess return forecasts. Indeed, the June 6, 2000 10-year annual forecast was 10.45% and the realized annual S&P 500 return through June 4, 2010 is -3.09%. There is some weak correlation between past returns, real interest rates and the of risk premium. In contrast, there is significant evidence on the relation between two common measures of economic risk and the risk premium. We find that both the implied volatility on the S&P index as well as a commonly used measure of credit spreads are highly correlated with our measured equity risk premium.

References

Asness, C. S., 2000, Stocks vs. bonds: Explaining the equity risk premium, *Financial Analysts Journal*, May/June.

Ben-David, I., J. R. Graham, and C. R. Harvey, 2010, Managerial miscalibration. Unpublished working paper, Available at SSRN: http://ssrn.com/abstract=1640552

Brav, A., J. R. Graham, C. R. Harvey, and R. Michaely, 2005, Payout policy in the 21st century, *Journal of Financial Economics* 77:3, 483-529.

Campello, M., J. R. Graham and C. R. Harvey, 2010. The real effects of financial constraints: Evidence from a financial crisis, *Journal of Financial Economics* 97, 470-487.

Campello, M., E. Giambona, J. R. Graham and C. R. Harvey, 2010. Liquidity management and corporate investment during a financial crisis, Unpublished working paper, University of Illinois and Duke University. Available at SSRN: http://ssrn.com/abstract=1444009

Claus, J. and J. Thomas, 2001, Equity premia as low as three percent: Evidence from analysts' earnings forecasts for domestic and international stock markets, *Journal of Finance* 56, 1629-1666.

Davidson, L. B., and D. O. Cooper, 1976, A simple way of developing a probability distribution of present value, *Journal of Petroleum Technology*, September, 1069-1078.

Fama, E. F. and French, K. R., 2002, The equity premium, *Journal of Finance* 57, 637-659.

Fernandez, P., 2004 Market risk premium: Required, historical and expected, Unpublished working paper, University of Navarra. Available at SSRN: http://ssrn.com/abstract=601761

Fernandez, P., 2006 Market risk premium in 100 textbooks, Unpublished working paper, University of Navarra. Available at SSRN: http://ssrn.com/abstract=1148373

Fernandez, P., 2009 Market risk premium used in 2008 by professors: A survey with 1,400 answers, Unpublished working paper, University of Navarra. Available at SSRN: http://ssrn.com/abstract=1344209

Gebhardt, W. R., C. M. C. Lee, and B. Swaminathan, 2001, Toward an implied cost of capital, *Journal of Accounting Research* 39, 135-176.

Goyal, A. and I. Welch, 2003, Predicting the risk premium, *Management Science* 49, 639-654.

Graham, J. R. and C. R. Harvey, 2001, Theory and practice of corporate finance: Evidence from the field, *Journal of Financial Economics* 60, 187-243.

Graham, J. R. and C. R. Harvey, 2003, Expectations of equity risk premia, volatility and asymmetry from a corporate finance perspective, Working paper, Available at SSRN: http://ssrn.com/abstract=292623

Graham, J. R., and C. R. Harvey, 2009, The CFO Global Business Outlook: 1996-2009. http://www.cfosurvey.org.

Graham, J. R., C. R. Harvey and M. Puri, 2010a, Managerial attitudes and corporate actions, Unpublished working paper, available at SSRN: http://ssrn.com/abstract=1432641

Graham, J. R., C. R. Harvey and M. Puri, 2010b, Capital allocation and delegation of decision-making authority within firms, Unpublished working paper, available at SSRN: http://ssrn.com/abstract=1527098

Graham, J. R., C. R. Harvey, and S. Rajgopal, 2005, The economic implications of corporate financial reporting, *Journal of Accounting and Economics* 40, 3-70. Working paper available at SSRN: http://ssrn.com/abstract=491627

Harris, R. S. and F. C. Marston, 2001, The market risk premium: Expectational estimates using analysts' forecasts, *Journal of Applied Finance* 11, 6-16.

Harvey, C. R., 2001, The specification of conditional expectations, *Journal of Empirical Finance* 8, 573-638.

Jagannathan, R., E. R. McGrattan and A. Scherbina, 2001, The declining U.S. equity premium, *Quarterly Review*, Federal Reserve Bank of Mineapolis.

Keefer, D. L. and S. E. Bodily, 1983, Three-point approximations for continuous random variables, *Management Science* 29, 5 595-609.

Pástor, L. And R. Stambaugh, 2001, The equity premium and structural breaks, *Journal of Finance* 56, 1207-1239.

Poterba, J. M. and Summers, L. H., 1995, A CEO survey of U.S. companies' time horizons and hurdle rates, *Sloan Management Review*, Fall, 43-53.

Siegel, J.J., 1999, The shrinking equity premium, *Journal of Portfolio Management*, 10-17.

Welch, I., 2000, Views of financial economists on the equity premium and other issues, *Journal of Business* 73 (October): 501-37.

Welch, I., 2001, The equity premium consensus forecast revisited, Unpublished working paper, Cowles Foundation for Research in Economics, Yale University, New Haven, CT. Available at SSRN: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=285169.

Welch, I., 2009, Views of economists about the equity premium and policy, Unpublished working paper, Brown University. Available at http://welch.econ.brown.edu/academics/equpdate-results2009.html

Appendix A

Excerpt from the Survey Instrument

14. On May 24, 2010 the annual yield on 10-yr treasury bonds was 3.2%. Please complete the following:

a. Over the next 10 years, I expect the average annual S&P 500 return will be:

Worst Case: There is a 1-in-10 chance the actual average return will be less than:	**Best Guess**: I expect the return to be:	Best Case: There is a 1-in-10 chance the actual average return will be greater than:
☐ %	☐ %	☐ %

b. During the next year, I expect the S&P 500 return will be:

Worst Case: There is a 1-in-10 chance the actual return will be less than:	**Best Guess**: I expect the return to be:	Best Case: There is a 1-in-10 chance the actual return will be greater than:
☐ %	☐ %	☐ %

Please check one from each category that best describes your company:

a. Industry

- ☐ Retail/Wholesale
- ☐ Mining/Construction
- ☐ Manufacturing
- ☐ Transportation/Energy
- ☐ Communications/Media
- ☐ Tech [Software/Biotech]
- ☐ Banking/Finance/Insurance
- ☐ Service/Consulting
- ☐ Healthcare/Pharmaceutical
- ☐ Other: ____

b. Sales Revenue

- ☐ Less than $25 million
- ☐ $25-$99 million
- ☐ $100-$499 million
- ☐ $500-$999 million
- ☐ $1-$4.9 billion
- ☐ $5-$9.9 billion
- ☐ More than $10 billion

c. Number of Employees

- ☐ Fewer than 100
- ☐ 100-499
- ☐ 500-999
- ☐ 1,000-2,499
- ☐ 2,500-4,999
- ☐ 5,000-9,999
- ☐ More than 10,000

d. Where are you personally located?

- ☐ Northeast U.S.
- ☐ Canada
- ☐ Central/Latin America

e. Ownership

- ☐ Public, NYSE
- ☐ Public, NASDAQ/AMEX

☐ Mountain U.S. ☐ Midwest U.S. ☐ South Central U.S. ☐ South Atlantic U.S. ☐ Pacific U.S. ☐ Europe ☐ Asia ☐ Other	☐ Private ☐ Government ☐ Nonprofit
f. Foreign Sales	**g. What is your company's credit rating?**
☐ 0% ☐ 1-24% ☐ 25-50% ☐ More than 50%	☐ Check here if you do not have a rating, and please estimate what your rating would be.
h. Your job title (e.g., CFO, Asst. Treasurer, etc)	

Submit

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