

The Consensus Estimate For The Equity Premium by Academic Financial Economists in December 2007

An Update to Welch (2000)

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Abstract

A sample of about 400 finance professors estimates the 1-year equity premium and the 30-year geometric equity premium to be about 5%, as of year-end 2007. The sample interquartile range is 4% to 6%. The typical range recommended in their classes is a little higher (from 4% to 7%, with a mean of 6%). Since 2001, participants have become more bearish (by about 0.5%).

The participants estimate the 30-year arithmetic equity premium estimate to be about 75 basis points higher than its geometric equivalent; and they estimate the 30-year geometric expected rate of return on the stock market to be about 9%.

75% of finance professors recommend using the CAPM for corporate capital budgeting purposes; 10% recommend the Fama-French model; 5% recommend an APT model.

Together with the risk-free rate of return, the equity premium may well be the single-most important number in financial economics. It holds sway not only over asset-allocation choices (whether to invest in equities or fixed-income securities), but also influences the capital budgeting choices of many firms through its critical role in the capital-asset-pricing model. Unfortunately, there is not only no generally accepted equity premium point estimate, there is not even a commonly agreed-upon *method* to estimate it.¹ This is why it is interesting to investigate a meta-estimate obtained from many different methods and/or many individuals.

The opinions of financial economics professors are intriguing for a number of reasons. First, financial economists in academic departments themselves influence the general opinion of practitioners. After all, many practitioners have enrolled in academic finance courses at one point in their careers. Second, academic financial economists have little at stake in a particular estimate—they do not need to convince themselves and others that the equity premium is either high or low. Third, thinking about issues such as the equity premium is their essential job function.

Nevertheless, this survey does not advocate that the academic professorial consensus equity premium estimate should be seen as the best available estimate. Instead, this consensus estimate should be viewed as the best “common practices” estimate for use in an academic setting.

Surveying academic financial economists about their equity premium opinions has a history. In October 1997 and October 1998, I took a first survey of academic financial economists. Welch (2000) reported that their consensus arithmetic equity premium estimate was about 7% per annum over 10-30 year horizons, and 6-7% over 1- to 5-year horizons. The optimistic/pessimistic range was from 2% to 13% per annum. Respondents claimed that they would revise their forecasts downward when the stock market rose. They believed other professors had a higher consensus estimates than their own.

¹Section I of Welch (2000) enumerates these methods. (Since then, there have been many interesting variations on these basic methods.) Welch (2007) is a less conventional alternative—possibly for good reason!

In August 2001 (after the end of the Tech rally of the late 1990s), I conducted a shorter version of the original survey. The answers of about 400 individuals were described in Welch (2001). By this point, the 1-year equity premium estimate had fallen to 3%, the 30-year equity premium estimate had fallen to about 5% to 5.5%.

In December 2007, I conducted the survey described in this update. Again, just under 400 finance professors participated. Participants estimate the 1-year equity premium and the 30-year geometric equity premium to be about 5%. The sample interquartile range is 4% to 6%. The typical range that these professors recommend in their classes is a little higher (from 4% to 7%, with a mean of 6%), but comfortably encompasses their own estimates. Since 2001, participants have become more bearish (by about 0.5%).

My respondents estimate the 30-year arithmetic equity premium estimate to be about 75 basis points higher than its geometric equivalent; and they estimate the 30-year stock market expected rate of return to be about 9%. The difference suggests an annual standard deviation of about 12-15%. This is also generally in line with their estimates of the probability of a decline in the stock market.

Finally, I asked one question not directly related to the equity premium—what method my survey participants would recommend for corporate capital budgeting purposes. 75% of finance professors recommend the CAPM, 10% recommend the Fama-French model, and 5% recommend an APT model. (The rest recommend a variety of other methods.)

I The Web Survey Form

On December 20, 2007, the American Finance Association kindly posted a note requesting participation in my survey on its web site. I also sent a short email requesting survey participation to about 6,600 email address culled from my own and the Ohio State University list of finance professors. (Many of the addresses were invalid, outdated, or duplicates.) Its text read:

Most of us are teaching the CAPM, where we have to use some estimate of the equity premium. Clearly, none of us know what the expected equity premium really is. However, many of us find it valuable to know what other finance professors are using. If nothing else, it provides a "standard practice" number.

In 1998, I conducted such a survey, and published it in the Journal of Business (also available from SSRN). Of course, this is now quite dated. It is quite possible that the consensus has changed. Therefore, I would like to take a new survey. I will post the results on my website and on SSRN in a short note for common use.

Of course, we are all just making educated guesses here. So, please don't leave answering this survey only to "other experts." (The survey has a field that allows you to tell me how comfortable or uncomfortable you are in providing your guestimates.)

So, I am begging you to go to

<http://welch.econ.brown.edu/equpdate-form2008.html>

and fill out as much as you deem reasonable. It should not take you more than 5 minutes.

And, of course, I would very much appreciate your help.

[Table 1]

Table 1 reproduces the html form that was used to administer the survey.²

By January 7, 2008, I had received 630 responses. Of these, 369 respondents had [a] provided an email address that ended with the string "edu" (or had filled out the survey from a host ending its domain name in "edu"), and [b] answered affirmatively that they were a finance professor.

II The Results

83 of the 543 respondents stated that they had participated in my original survey in 1998-9, 92 had participated in 2001. 235 respondents were not familiar with the resulting paper (Welch (2000)); 214 stated that it had no influence on them. 53 participants stated that the paper had lowered their own estimates; and 10 participants stated that it had raised their original estimates. (Among U.S. finance professors, 32 indicated it had lowered their estimates, 6 that it had raised their estimats.)

²Over the course of the week, I made small corrections and improvements to the web survey. None of them was significant enough to influence the results.

A Parametric Estimates

[Table 2]

Table 2 reports the main findings of this December 2007 update. The table distinguishes between my aforementioned core sample 369 U.S. financial economics professors and the 219 other respondents.

- In general, medians are fairly uninformative, because most participants rounded their estimates to integers. Thus, truncated means are better statistics.
- The average and typical equity premium estimate among the sample of U.S. financial economists was around 5%. This applies both to the geometric 30-year estimate and to the 1-year estimate.
- The arithmetic 30-year equity premium estimate was about 0.7% to 0.8% higher than its geometric equivalent. The arithmetic/geometric difference implies an annual volatility estimate of about 12% to 13% per annum.
- Most of the remaining participants identified themselves as foreign finance professors. (Unlike U.S. economists, where an .edu address helps confirm the identity, there was no easy way for me to get a second piece of information confirming identity.) Table 2 shows that foreign finance professors were more conservative. For the 1-year forecast, their average estimate is about 90 basis points lower. For the 30-year forecast, it is about 40-50 basis points lower.

[Figure 1]

Figure 1 plots the density of *all* responses. The non-parametric smoother shows that 4% and 5% were the most common attractors.

The remainder of this paper focuses on the core sample of identified U.S. finance professors.

- In class, survey participants use a 6% estimate, which is higher than their own beliefs—but they also advocate a range from 4% to 7% that comfortably encompasses their own opinion.

- The participants suggest that they have lowered their estimates over the last 6 years by about 0.6% to 0.7%.
- The expected stock market rate of return exceeds the equity premium by about 3%.

B Volatility Estimates

[Table 3]

Table 3 shows the estimates of equity risk perceived by my survey participants. The average and typical probability of a decline in the stock market over the next year is estimated to be about 1/3. This is consistent with the aforecomputed volatility estimate of about 12-13% per annum.

A decline of more than 20% is perceived to have a probability of around 10%. This suggests a fat-tailed distribution. If the return distribution were normal, the probability estimate should be under 2.5%.

On the other hand, the probability of losing 20% or more under the aforementioned normal distribution (mean 5.8%, standard deviation 13%) is about 4%. This is reasonably close to the 5% median estimate provided by the survey participants.

C Heterogeneity

[Table 4]

Table 4 shows that the average participant in the survey (not surprisingly) believes that (s)he has thought more about the relevant issues. There is no clear pattern between the self-assessed expertise of participants and their 1-year forecasts. There were only 12 participants who stated that they had thought a lot less than their peers about the issue. Of the remaining participants, there seems to be a mild relation between having thought more about the issue and believing in a smaller equity premium estimate.

[Table 5]

Table 5 shows that there is no important relationship between perceiving the survey as clear and the answers.

[Table 6]

Table 6 shows that 47 respondents who claimed to have become more bullish since 2004 had 1-year and 30-year arithmetic equity premium estimates about 30-50 basis points higher than the average. Their 30-year geometric estimate was however only 10 basis points higher than average. 122 respondents who had become more bearish were about 30 to 80 basis points more pessimistic than average.

D Method of Capital Budgeting

[Table 7]

I took the opportunity to ask respondents what method they would recommend for corporate capital budgeting. Table 7 shows that the CAPM is recommended by 265 out of 360 respondents. The strong theoretical underpinning of the CAPM seems to outweigh the fact that it has almost no empirical evidence supporting it. In contrast, the Fama-French model, which lacks a strong theoretical underpinning but performs well empirically, can garner only 41 supporters. General APT approaches to capital budgeting are even less prominent.

III Data

The data (sans identifying information) from this survey will be available at

<http://welch.econ.brown.edu/academics/>.

This paper will not be published and may move. Please cite the original Welch (2000) paper, and refer to this paper as the 2007 update.

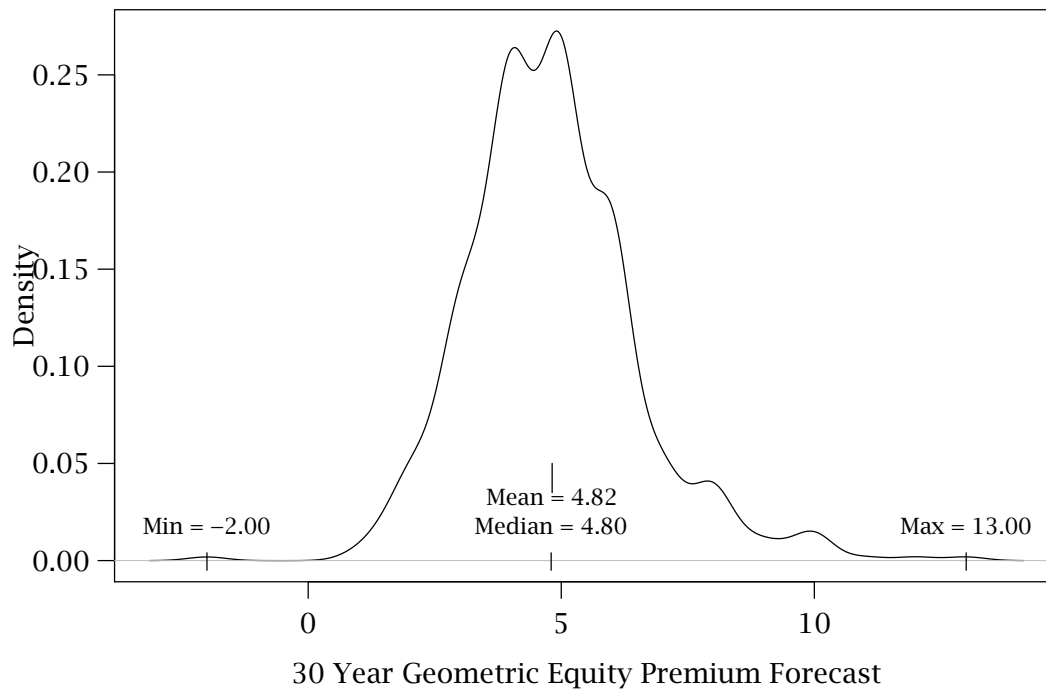
References

Welch, I., 2000, "Views of Financial Economists on the Equity Premium and on Professional Controversies," *Journal of Business*, 73(4), 501-537.

———, 2001, "The Equity Premium Consensus Forecast Revisited," working paper, Yale University.

———, 2007, "A Different Way to Estimate the Equity Premium (for CAPM and One-Factor Model Use Only)," working paper, Brown University.

Figure 1: Density Plot of 30-Year Geometric Equity Premium Estimates



Explanation: This plot includes *all* responses. The few extreme non-sensical responses drop out of the subsample of U.S. finance professors.

Table 1: The HTML Survey Form

Short Academic Equity Premium Survey

Your answers to this short survey will be used to update my Journal of Business equity premium survey from 1998 (and its follow-up from 2001). Your answers will be held strictly confidential. If you have difficulties filling out this survey, please send an email to Ivo Welch.

Background Information: For the prevailing yield curve, click [yahoo link]. For the prevailing S&P500, click [yahoo link]

Personal Information

My email address is:

I am a finance or economics professor:

Yes.
No.
Soon.

Relative to other financial economists, I would guess that I have thought about the equity premium

no answer,
a lot more carefully,
more carefully,
about the same,
less carefully,
a lot less carefully

I participated in Ivo Welch's previous equity premium survey in 1998/1999:

Yes.
No.

I participated in Ivo Welch's update for the equity premium survey in 2001:

Yes.
No.

If you read either my original JB survey paper or its update, did it influence you to lower or raise your estimate?

no answer
did not read
read it, but it had no influence
read it, lowered my own estimate
read it, raised my own estimate

Relative to my views 6 years ago, my views about the stock market's long term performance are today:

no answer
a lot more bullish than in 2001
more bullish
about the same
more bearish
a lot more bearish

(Table 1 continued.)

Parametric Equity Premium Estimates

I expect the average equity premium over the next 1 year to be _____ percent per year.
(define avg equity premium as the expected return on the value-weighted US market net of short-term T-bills)

I expect the average arithmetic equity premium over the next 30 years to be _____ percent per year.
(relative to future contemporaneous short-term (3 month) T-Bills*)

I expect the average geometric* equity premium over the next 30 years to be _____ percent per year.
(relative to future contemporaneous short-term (3 month) T-Bills)

G30-A.1: Same question: In your classes, what is the main number you are recommending for long-term CAPM purposes? _____ percent per year.

G30-A.2: Same question: In your classes, if you give a reasonable range for CAPM use, what is it? _____ to _____ percent per year.

G30-B: Same question: What would you have answered to the main question (30 year geo equity premium forecast) 6 years ago, i.e., in 2001? _____ percent per year.

I expect the average nominal geometric stock return (not equity premium!) over the next 30 years to be _____ percent per year.

(Table 1 continued.)

Non-Parametric and Probability Equity Premium Estimates

Please give me an over/under bet for the S&P500 for December 31, 2008: -----
your level estimate should result in a risk-neutral, fair bet for either side (i.e., not adjusted for hedging/risk premia)

What is the probability that the stock market will go down over the next 12 months? ----- percent probability
think of the market here as the Vanguard S&P500 fund (level plus dividends) total rate of return, not the equity premium.

What is the probability that the stock market will decline (lose money) over the next 12 months by 20% or more? ----- percent probability

What is the probability that the stock market will decline (lose money) over the next 10 years? ----- percent probability

Off-hand question: How should non-financial corporations do project capital budgeting? Pick most applicable.

no-answer
Use CAPM (or CAPM variant), equity premium 2-3%
Use CAPM (or CAPM variant), equity premium 3-5%
Use CAPM (or CAPM variant), equity premium 5-6%
Use CAPM (or CAPM variant), equity premium 6-7%
Use CAPM (or CAPM variant), equity premium 7-8%
Use Fama-French-type Model
Use APT-type Model
Use Statistical Model—Historical Market Model
Use Statistical Model—Historical Industry Model
Use Equity Premium Estimate, no matter what
Use 10 percent, no matter what

(continued:) Is this what you tell your students?

no-answer
yes
no

Were the questions in this survey clear?

no answer
clear
muddy
unclear

Do you want me to email you with the results when I have them?

no answer
yes
no

Table 2: The Parametric Predictions

	Percentiles					Moments		N			
	00	05	25	50	75	95	100		mean	mean	sd
1-Year Equity Premium	-10.0	1.0	4.0	5.0	6.0	8.0	12.0	4.86	4.95	2.53	369
<i>Omitted Self-Id'ed Finance Profs</i>			3.0	4.0	6.0				4.00	3.11	183
<i>Same for All Omitted Individuals</i>			3.0	4.0	6.0				4.01	3.33	219
30-Year Ari Eq Prem	2.0	3.0	4.5	5.8	7.0	8.6	12.0	5.74	5.69	1.67	370
<i>Omitted Self-Id'ed Finance Profs</i>			4.0	5.0	6.0				5.20	1.65	186
<i>Same for All Omitted Individuals</i>			4.0	5.0	6.0				5.21	1.69	218
30-Year Geo Eq Prem	-2.0	2.8	4.0	5.0	6.0	8.0	13.0	5.00	4.97	1.68	363
<i>Omitted Self-Id'ed Finance Profs</i>			3.5	4.0	5.0				4.46	1.74	172
<i>Same for All Omitted Individuals</i>			3.5	4.0	5.0				4.46	1.70	202
Used in class	2.0	4.0	5.0	6.0	7.0	8.5	20.0	5.96	5.89	1.70	360
Min in class	-2.0	2.0	3.0	4.0	5.0	7.0	10.0	4.34	4.35	1.51	333
Max in class	3.0	5.0	6.0	7.0	8.0	11.0	85.0	7.76	7.50	4.67	336
30-Year Geo Eq Prem in 2001	-4.0	3.0	4.5	6.0	7.0	8.0	12.0	5.69	5.68	1.81	325
Change from 2001 (Geo 30)	-4.5	-3.0	-2.0	-0.6	0.0	1.6	5.8	-0.77	-0.81	1.52	316
<i>Same for All Omitted Individuals</i>			-2.0	-0.5	0.0				-0.75	1.48	166
30-Year Stock Market Return	1.0	6.0	8.0	9.0	10.0	12.0	16.0	9.08	9.11	1.97	368
Over-under Bet	1,000	1,360	1,500	1,558	1,600	1,650		2,900	1,547	1,544	245

Explanation: Most numbers are quoted in percent per year, except the over-under bet (and of course the number of observations).

Table 3: Probability of A Stock Market Decline

	Percentiles							Moments			N
	00	05	25	50	75	95	100	mean	mean	sd	
over next 12 months	1	15	30	35	50	60	90	37.79	35.96	16.40	355
20% or more over 12 months	1	2	5	10	15	30	80	11.94	11.44	10.94	348
20% or more over 10 years	0	1	2	5	10	30	95	7.96	6.86	12.02	318

Explanation: |mean| is the trimmed mean, where answers are winsorized at the 5th and 95th percentiles. The rest should be self-explanatory.

Table 4: Estimates By Expertise, in Percent Per Year

	N	1-Year Equity Premium	30-Year Arithmetic	30-Year Geometric	Difference Ari vs. Geo
Thought Lot Less	12	5.1	5.0	4.7	0.35
Thought Less	57	5.1	6.1	5.5	0.69
Same	172	4.8	5.8	5.1	0.82
Thought More	95	4.7	5.6	4.8	0.85
Thought Lot More	41	5.2	5.3	4.3	0.78
Missing	10+	4.9	5.9	5.6	0.37

Explanation: The reported statistics are trimmed means, quoted in percent.

Table 5: Estimates By Perception of Clarity, in Percent Per Year

	N	1-Year Equity Premium	30-Year Arithmetic	30-Year Geometric	Difference Ari vs. Geo
Unclear	7	5.0	6.3	5.8	0.53
Muddy	64	4.9	5.5	4.8	0.69
Clear	277	4.8	5.7	5.0	0.80
Missing	30+	5.0	6.1	5.6	0.76

Explanation: The reported statistics are trimmed means, quoted in percent.

Table 6: By History: More Bearish or Bullish since 2001? (In Percent Per Year)

	N	1-Year Equity Premium	30-Year Arithmetic	30-Year Geometric	Difference Ari vs. Geo
more bearish	122	4.2	5.5	4.7	0.79
same	163	5.2	5.8	5.1	0.80
more bullish	47	5.4	6.1	5.1	0.86
Missing	55+	4.8	5.9	5.4	0.62

Explanation: This combines the categories of bullish with very bullish, and bearish with very bearish. The reported statistics are trimmed means, quoted in percent.

Table 7: Recommended Model of Capital Budgeting, in Percent Per Year

	N	1-Year Equity Premium	30-Year Arithmetic	30-Year Geometric	Difference Ari vs. Geo
CAPM, 2-3%	23	2.4	3.6	2.7	0.92
CAPM, 3-5%	19	4.1	4.5	3.7	0.87
CAPM, 5-6%	150	5.0	5.7	4.9	0.84
CAPM, 6-7%	24	5.9	6.1	5.4	0.80
CAPM, 7-8%	49	6.1	7.6	6.6	1.00
Fama-French	41	4.7	5.9	5.5	0.48
APT	21	4.0	5.7	4.7	0.69
Industry Model	14	4.7	5.8	5.0	0.92
Market Model	4	4.9	4.9	5.3	0.25
Equity Premium	8	4.3	5.1	5.4	-0.35
10%	7	3.9	4.5	4.0	0.74
Missing	29	4.5	5.1	4.7	0.50

Explanation: The reported statistics are trimmed means, quoted in percent.