

A New Look at the Equity Premium Puzzle

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Abstract

The equity premium puzzle is based on the common observation that in order for stock returns to be much higher than those offered by government bonds in the United States, investors must ultimately have incredibly high risk aversion. This situation is not unique to the United States, as it can be found elsewhere in other industrialized nations. The equity premium puzzle has intrigued many modern finance researchers and much effort has been expended in the pursuit of its root cause. Several theories have been developed exploring possible explanations, but a definitive solution remains undiscovered. In order to evaluate possible sources of further research, we have surveyed financial professionals and find they offer unique insights into possibly solving the equity premium puzzle.

Introduction

The survey instrument used in this research can provide further support of existing theories and shed light on what steps may be next in the search for a final solution to this puzzle. In the United States, where the majority of respondents reside, the risk premium of equity has hovered, on average, around 6% though varying extensively between longer periods of time (e.g. by decade). This variation over long periods of time is what does not fit with traditional views of risk or modern economic and financial models. Given the research presented in this article and the views expressed by professionals most familiar with the topic, it may be possible to infer views that may drive this gap size or shape the fundamentals of the puzzle itself.

This article presents the results of a survey of 116 finance professors regarding their assumptions and opinions of the equity premium puzzle. The survey (presented in Appendix A) was activated online on March, 1st and was available until March 15th 2007. During that period a slight crash occurred in the U.S. stock markets. However, all indices were able to recoup at least partially, as can be seen today.

Additionally, some earlier research by Fama and French in 2001, Shiller in 2000 and Welch in 2001 may have affected investor's opinions about the equity premium. Welch investigated that the consensus of "finance professional's" outlook concerning the equity premium was higher than the premium actually was. Thus, with a market downfall that may have resulted in finance professors being more pessimistic, we investigated further the comments made by Welch. In addition, we posed questions that may have further implications regarding other theories.

The true value of the equity risk premium is often at the center of constant discussion among academics and researchers. The value of the equity risk premium is the degree to

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which risky assets, or stocks, are expected to outperform relatively risk-free assets, such as bonds. Generally, there has been very little consensus concerning the value of the equity risk premium because of the role that varying, unobservable agent expectations play in shaping market portfolio and risk-free returns. The true value of the equity risk premium contends as “one of the most important but elusive quantities in finance” (Pastor & Stambaugh 2001). This is noted as several plausible theories that attempt to explain the quantity are explored.

Literature Review

Research has been conducted to find historical, yet varying, views on the true value of the equity risk premium. These studies have evaluated the phenomenon mostly in the United States but have also touched on other countries as well. The value of the equity premium in the U.S. has ranged from 4.3% on average from 1870 to 1998 (Shiller 1989) and 5.8% during the entirety of the 20th century (Dimson 2000) to 6% during the 1889 to 1978 period (Mehra & Prescott 1985) to even between 8.2% and 8.6% in 1995 (Brealey & Myers 1996). Alternatively, in Germany, Canada, France, Japan, and the United Kingdom, the equity premium has been measured as low as 3% (Claus & Thomas 2001) and as moderately-high as 4.6% in Canada, 7.7% in France, and 4.9% in the United Kingdom for the entirety of the 20th century (Dimson 2000).

The first method used to describe the source of the equity premium involves the use of utility in consumer consumption patterns. Research has been conducted that depicts utility received by a consumer today is an elastic function of current consumption as well as future utility (Epstein & Zin 1989, 1991). The authors determined that covariance with market return and consumer consumption growth help to resolve systematic risk, or the varying returns on any two assets. Epstein and Zin conclude that investors achieve the higher rate of return on risky assets because of their effect on consumption growth as well as the covariance described above.

Additionally, research describing habit formation as a possible explanation for the equity premium puzzle has been proposed (Constantinides 1990). Similar to the work of Epstein and Zin, Constantinides contends that utility, in monetary terms, is actually a decreasing function of consumption in previous periods. This means that it takes more for a consumer to be happy today if he were to consume more yesterday. This research concluded with the thought that should one’s demand for savings increase, the immediate effect would be a lowering of relatively risk-free yields, such as government bonds, notes, and bills.

One of the more prominent arguments for this type of explanation involved referencing psychological preferences in financial decision-making. The research depicted agents as having displayed loss aversion in their financial decision-making and consequent results (Benartzi & Thaler 1995). This simply implies that investors show significantly more hurt when faced with losses than more pleasure when faced with gains. Loss-aversion, then, can be used to explain a switch to relatively risk-free investments during periods of potentially weak risky investment performance. Consequently, the research can be followed to describe a now-required rise in risky investment returns in order to attract agents.

The most common explanation put forth by researchers involves the basic risk reward tradeoff. A study performed suggests, as is commonly taught, that the equity premium exists in conjunction with risk aversion on the part of investors (Mehra & Prescott 1985). Simply stated, this suggests that an investor’s avoidance of risk is positively correlated with his or her

desire to invest in relatively risk-free assets. Similarly, research has also been conducted that concludes that stocks deserve higher returns because one will not invest without appropriate compensation for assets that are “far more risky” than government issues (Abel 1991).

Stock returns have also been modeled as leveraged claims against the firms invested in (Benninga & Protopapadakis 1990). These authors also suggest that, in order to adequately measure the equity premium, investors must possess a high amount of risk aversion. Further research follows these ideas and states that average returns of stocks covary more with consumption growth than do relatively risk-free assets (Kocherlakota 1996). This risk-aversion argument supports risk as the primary factor needing consideration when determining the equity risk premium.

Thus far, possible explanations haven't focused much on the lower end of the premium spread, or the risk-free rate. Prominent research was conducted that suggested the equity risk premium has much to do with changing real returns of bonds during times of inflation (Siegel 1998). Siegel also concludes that stock returns will move with prices that also rise and will act as an effective hedge to inflation. In support of this, additional research described rising inflation as a determinant in increasing long-term interest rates and lower bond prices (Buckley 1999). Thus, relatively risk-free assets will return much less during inflationary times when compared to risky investments.

Several additional arguments exist for use in explaining the equity premium. Research has been done concerning limited market participation and its effect on the equity premium puzzle (Polkovnichenko 2002). It is derived from this research that those individuals who have a low level of income choose to not participate in the equity (more risky when compared to bonds) market. This lacking participation, it is concluded, results in limited sharing of risk over investment opportunities but fails to explain the equity premium puzzle. In further research, three-quarters of United States households were classified as non-stockholders, attributing themselves to the idea of limited market participation (Mankiw & Zeldes 1991).

Finally, the trading cost model has been presented as another solution to the derivation of the equity risk premium. Authors suggest that the higher costs associated with trading risky assets versus relatively risk-free assets exist due to the existence of transaction costs (Heaton & Lucas 1996). It is believed that these costs are one of the major causes of the relatively high historical equity premium over the risk-free rate (Fisher 1994). To compliment this, it has also been suggested that illiquidity, coupled with transaction costs, cause relatively risk-free assets to be overly invested in when compared to other, more risky, assets (Swan 2001).

Data and Methods

This paper revisits earlier results by also considering expected performance of diverse stock indices coupled with different investment strategies. Our survey received 116 responses from finance professors in North America. Given the backgrounds of respondents as financial professionals, a certain amount of reliability in responses can be assumed. The survey includes 20 questions which were divided into three sections. The first section dealt with investment strategies and accounted for eight questions. Section two discussed the equity premium puzzle, consisting of seven questions. And in the last section the respondent was asked to answer five questions concerning demographics. The survey is shown in Figure

I. We used www.surveymonkey.com to host the survey online. The link to the survey was <http://www.surveymonkey.com/s.asp?u=127943376178> and was only accessible to the finance professors that we contacted via e-mail during the timeframe described earlier.

We sent our email, which can be seen as Figure II, including the link required to access the survey to roughly 2,000 professors from universities in North America (U.S. and Canada exclusively). Thus, the response rate accounts for 5.8% percent. All of the respondents answered the questions appropriately so that we need not exclude any of the respondents. On March, 15th the survey was closed and the results were downloaded to a Microsoft Excel spreadsheet available directly from Survey Monkey's user interface.

Some of the results needed to be "cleaned" in such a way that various answers were formatted appropriately so that responses were uniform. Cleaned results were then converted into yet another Microsoft Excel spreadsheet. For example, a typical case which required "cleaning" was professor estimates of the three leading U.S. indices' developments. Some respondents answered with a percentage increase of the indices while others answered with an index point increase. These heterogeneous responses were standardized into point-based expectations. Percentage increases were based on a DJIA level of 12,400, an S&P 500 level of 1,400, and a NASDAQ level of 2,500.

After the answers were converted into the new Microsoft Excel spreadsheet, we ran partial regressions among all variables using SPSS, where variables correspond with the questions posted on the survey. This was done to disclose both correlations among the variables and correlations between the variables, all the while seeking general information regarding the equity premium puzzle. Since some of the questions implicated similar meanings we reduced some of our variables to be inclusive. Cases of this included respondents answering Question 10 with either Daily updates or Daily updates coupled with desktop tracking. These two answers were considered similar.

The survey was anonymous. That is, solely the Microsoft Excel spreadsheet and its contents from www.surveymonkey.com were downloaded and analyzed. This spreadsheet included the summary of all answers posed in the questionnaire and nothing else. We had no access to any personal information of any type aside from what was provided us by participants in the original survey.

Results

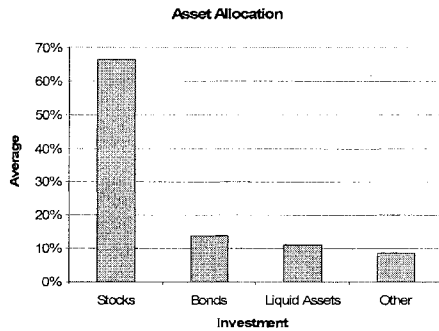
The answers we were seeking that revolved around the equity premium puzzle were limited in scope. Obviously, when receiving 116 responses from a base of 2,000 possible response candidates, our research was not as conclusive as we would have liked. We sought to gather enough information to validate previous theories concerning a large equity premium occurring during times of bullish markets. The markets, however, hiccupped slightly during the time of this survey after experiencing relatively sizable gains. The DJIA had even recently topped 12,000 and had captured several record-breaking values.

By measuring investment strategies couple with assumptions concerning the equity premium, stock returns, and T-Bill returns we also hoped to garner more insight into the actual varied sizes of the equity premium during similar economic times. By measuring expectations and assumptions from the "top" down, that is from the more educated and familiar, we looked for ways to compliment previous theories that have attempted to explain

fully the equity premium puzzle. Again, our response rate was a limitation. We did, however, gather interesting secondary-data from the respondents of the survey.

One measure that we have been able to derive from our survey is that of asset allocation in actively managed investment portfolios. Percentage allocation was measured in four categories: stocks, bonds, liquid assets (e.g. treasury bills), and other (e.g. real estate). On average, respondents reported allocations of stocks at 66.47%, bonds at 13.79%, liquid assets at 11.19%, and other investments at 8.60%. Asset allocation can be viewed below.

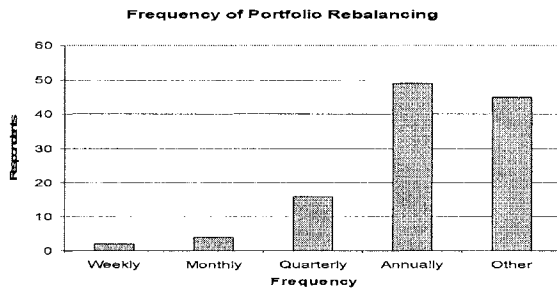
Figure I



To compliment this, on average, respondents expected a 19.79% increase in the point value of the DJIA, a 21.68% increase in the point value of the S&P 500 and an 18.36% increase in the point value of the NASDAQ. Given recent sentiment and expectations that stock indices will continue to exhibit strong performance, it is likely that these investors are demonstrating low risk aversion during times of bull markets.

The survey also measured the frequency to which respondents balanced and rebalanced their investment portfolios to match their respective asset allocations. Frequencies were categorized into five groups. These included: weekly, monthly, quarterly, annually, and other (e.g. never, seldom). Of the 116 respondents, only 2 rebalanced weekly, 4 monthly, 16 quarterly, 49 annually, and 45 other. These results are summarized below.

Figure II

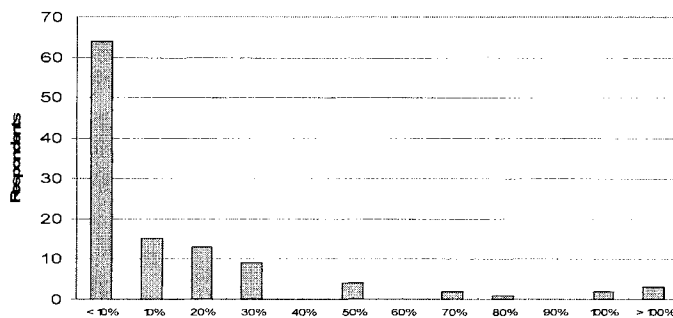


These results imply long-term investment strategies amongst collegiate finance faculty. Additionally, long-term strategies provide little opportunity for rebalancing should the equity premium change rapidly; it would take at least an entire year for most of these

respondents to react. To compliment this, the survey also measured the extent to which respondents were turning over their portfolios.

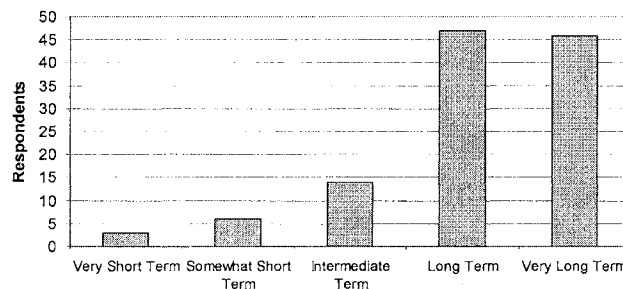
Portfolio turnover was measured from less than 10% to over 100% with 10% intervals (e.g. < 10%, 10%, 20%, etc.). Overwhelmingly, 64 respondents responded with less than 10% portfolio turnover. Also, 15 responded with 10% turnover, 13 with 20%, 9 with 30%, 4 with 50%, 2 with 70%, 1 with 80%, 2 with 100%, and 3 with greater than 100%. Again, this implies a long-term investment horizon. The results of this question are summarized below.

Figure III
Portfolio Turnover



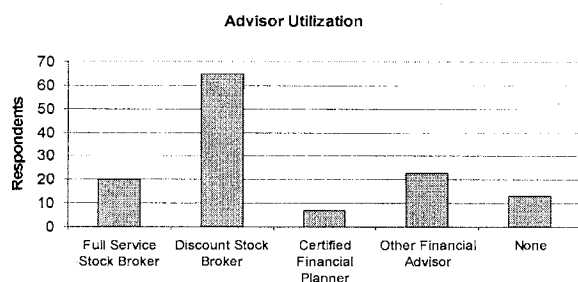
The survey also measured investment horizon. And, as expected, the term for most respondents was long to very long. Horizon was categorized as either very short-term, somewhat short-term, intermediate-term, long-term, and very long-term. Long-term and very long-term comprised 93 of the responses (47 long-term and 46 very long-term), while 14 invested at the intermediate horizon, 6 at the somewhat short horizon, and 3 at the very short horizon. The results are summarized below in Figure IV.

Figure IV
Investment Horizon



So, who is it that is so long-term oriented in their investment allocation, turnover, and horizon? We asked the 116 respondents who were in charge of their portfolios. The survey included choices of full-service stock brokers; 17.24% of respondents, discount stock brokers; 56.03%, certified financial planners; 6.03%, other financial advisor (e.g. yourself); 19.83%, and none; 11.21%. Results are summarized below in Figure V.

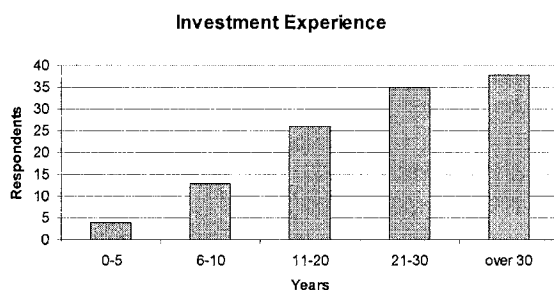
Figure V



The above data implies that the majority of collegiate finance faculty is not actively managing their own portfolios, but instead hire outside individuals or firms to do so in their stead. It is assumed that investor-generated guidelines have been provided to these outside portfolio managers. Without this assumption, whatever links may be found between now outside-oriented portfolio balance, allocation, and horizon with the respondent's personal outlook, assumptions, and expectations would be in question. Further research is needed to survey to what extent these guidelines exist.

The survey also asked its participants the extent to which they were experienced in the Investments field. We were able to gather this by measuring the number of years spent investing. These results were used to qualify the data gathered in other parts of the survey. Experience was based on five time-frames: 0-5 years, 6-10, 11-20, 21-30, and over 30. There were 99 respondents (85.34%) with over 10 years of investment experience, with 26 in the 11-20 year bracket, 35 in the 21-30 bracket, and 38 in the over 30 bracket. Results are summarized below in Figure VI.

Figure VI



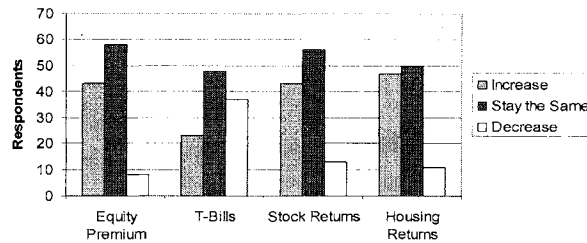
The main thrust of this survey was to test information regarding the equity premium. However, since our results were limited, we were unable to obtain information that can be concretely used to compliment existing theories. We did, however, gather some data that is of interest. Particularly, there were 79.1% of respondents that were aware of the equity risk premium puzzle, while 20.9% were not. In addition, 90.6% of 116 respondents believed the equity premium to range from 3-7%, a sizable span, during the next 30 years.

We also sought to gather data on expectations regarding the equity premium, stocks, T-Bills, and housing. Stock returns represent the upper portion of the equity premium spread, while T-Bills typically represent the lower end. The survey asked for 30-year expectations, given the performance of all variables over the previous 30 years. Most respondents believed

little change would occur with all variables, closely followed by an increase with all variables. The only exception occurs with T-Bills, where more respondents believed that returns would decrease rather than increase. Results are summarized below in Figure VII.

Figure VII

Expectations



The above data implies investors are geared to continue working in bullish markets. If stock returns are high and will continue to increase, it is likely that these investors will choose to put money into these risky assets rather than the relatively risk-free. This leads to the assumption that the equity risk premium will always rise during bull markets as more people invest with lower risk aversion. We would suspect the opposite during bear markets.

We also measured partial correlations against all variables. We found very little that was of major significance. We did, however, find a few items that were deserving of attention. For example, the longer an individual's investment horizon, the more aware they were of the existence of an equity premium puzzle. This was in accord with what we were expecting to find. However, we also found a few partial correlations that were strange, but still significant. For example, the higher an investor's experience, the less likely they were aware of the equity premium puzzle. In addition, we found that the higher an investor's outlook for each of the major U.S. indices, the less aware they were of the equity premium puzzle. Finally, and most interesting, is the positive correlation between lack of a target asset allocation and equity premium puzzle awareness. Perhaps this implies reliance on the equity premium on the investor's part.

Conclusion

Given the nature of this research's survey results used in explaining the anomaly found in equity pricing, the findings presented would be more consistent with technical methods of market analysis as opposed to fundamental. But what theories have been complimented? An argument could be made for many of the presented theories; however, it will require further research to come to any concrete conclusions. Suggestions for further research involve the investigation of trading costs in one's choice to invest at a long-term horizon, the inclusion of low income-level finance faculty and the amount to which they participate in the financial markets, and to what level are faculty risk-averse when faced with a recent history of poor, rather than decent, stock returns.

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Appendix A
Survey Instrument

A-1: Survey Cover Letter

Dear Finance Professor:

We want to know where you think the stock market is headed. Given your education and experience you should be a true expert on this topic!

This is a very short survey which should take only 2-4 minutes to complete. The responses are anonymous. To complete the survey, please click here:
<http://www.surveymonkey.com/s.asp?u=127943376178>

We are MBA students and we will present the results of this survey at an academic conference later this semester. We certainly appreciate your time and attention.

Thank you again!

Thomas Kochanek
MBA Student

Jeremy Alexander
MBA Student

A2: Survey Questionnaire

1. Which of the following do you utilize? Check all that apply!
 - a. Full Service Stock Broker
 - b. Discount Stock Broker
 - c. Certified Financial Planner
 - d. Other Financial Advisor (please specify)
2. What percent of your portfolio do you turn over each year?
< 10, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, > 100
3. What is your asset allocation (in percent)?
Stocks: _____ Liquid Assets: _____
Bonds: _____ Other: _____
4. Do you have an asset allocation target among stocks, bonds, and cash?
 - a. Yes
 - b. No
5. How often do you rebalance your portfolio?
 - a. Weekly
 - b. Monthly
 - c. Quarterly
 - d. Annually
 - e. Other (please specify):
6. How dedicated are you in rebalancing your asset allocation?
 - a. Occasionally
 - b. Somewhat Dedicated
 - c. Very Dedicated
7. Is your investment strategy more long term or short term?
 - a. Very Short Term
 - b. Somewhat Short Term
 - c. Intermediate Term
 - d. Long Term
 - e. Very Long Term
8. For how many years have you been investing?
 - a. 0-5
 - b. 6-10
 - c. 11-20
 - d. 21-30
 - e. Over 30
9. Are you aware of the Equity Premium Puzzle?
 - a. Yes
 - b. No
10. How closely do you track your investments?
 - a. Daily
 - b. Daily (w/Auto-Update)
 - c. Quarterly
 - d. Monthly
 - e. Quarterly

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- c. Weekly f. Yearly
11. For the coming year, how would you describe your outlook for the stock market?
(Bear) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 (Bull)
 12. During the next 30 years, what do you believe the Equity Premium will be?
0%, 1%, 2%, 3%, 4%, 5%, 6%, 7%, 8%, 9%, 10%, >10%
 13. During the next 30 years, what do you believe will be the annual compounded rate of return for the S&P 500?
 14. Where will the averages of these major stock indices be in 3 years?
DJIA: _____ S&P 500: _____ NASDAQ: _____
 15. Compared with the past 30 years, do you believe that over the next 30 years:

	Increase	Decrease	Stay the Same
The Equity Premium Will	_____	_____	_____
T-Bill Rates Will	_____	_____	_____
Stock Returns Will	_____	_____	_____
Housing Returns Will	_____	_____	_____
 16. Gender:
 - a. Male b. Female
 17. Age:
 - a. Under 30 d. 51-60
 - b. 30-40 e. 61-65
 - c. 41-50 f. Over 65
 18. Household Income:
 - a. Under \$75,000 d. \$150,001-\$200,000
 - b. \$75,000-\$100,000 e. Over \$200,000
 - c. \$100,001-\$150,000
 19. Marital Status:
 - a. Married b. Unmarried c. Long-Term Relationship
 20. Which area do you teach most often?
 - a. Corporate Finance d. Real Estate
 - b. Investments e. Insurance
 - c. Institutions f. Multiple Areas