Subjective Beliefs and Portfolio Choice: Evidence from Financial Advisors

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Motivation

- Beliefs are central to models of macroeconomics and finance, and related debates
- Surveys are increasingly used to test and characterize investors' subjective beliefs
- Most evidence on subjective beliefs focuses on return expectation
  - Subjective return expectation may include both risk premia and mispricing (i.e. alpha)
- Most evidence on subjective beliefs focuses on retail investors
  - We know relatively little about more sophisticated individual investors
  - In general, very difficult to link beliefs to portfolio data

Questions:

1. *How do wealth managers form beliefs about returns across asset classes?*
2. *How do beliefs affect portfolio decisions?*

This paper

We explore return expectations by surveying professional wealth managers

1. In ongoing surveys, we elicit managers' subjective beliefs about:
   - Return expectation, by asset class
   - Required rate of return to invest, by asset class
   - Fundamentals (e.g. GDP growth, inflation, recession probability)
2. We test how return expectations reflect required returns and abnormal returns
3. We then link subjective beliefs to planned investments and portfolio data
   - Survey asks about planned actions (increase, decrease, no change) in each asset class
   - Advisors can be linked to investors' portfolio data across asset classes

The setting is ideal for the study of investor beliefs because:

- These are sophisticated investors who manage a lot of money
- Evidence on the pass-through of subjective beliefs to portfolio decisions is limited

Main results

1. Decompose subjective return expectation into subjective risk premium + subjective alpha
   - Two components of return expectation play distinct roles
   - Subjective risk premium drives long-run return expectations
   - Subjective alpha drives short-term return expectation

2. Subjective alpha primarily drives *planned* changes to asset allocation
   - Higher (lower) return expectations are associated with intention to buy (sell)
   - This is driven by subjective alpha not subjective risk premia

3. *Actual* portfolio changes reflect stated plans
   - Despite advisory role, sensitivity of trading to beliefs appears sizeable
   - These portfolios are large, and relatively active across asset classes

Overall, the distinction between expected and required returns is important for linking survey evidence to investor behavior.

Related literature

Outline

Survey questions and interpretation

Addepar

- Addepar is a leading technology provider for wealth managers:
  - Provides financial reporting and analysis
  - Platform can be used to provide daily data on financial wealth
  - Advisors range from single family offices to large firms

- Survey consists of three main sections:
  1. Screening
  2. Existing and planned investments
  3. Subjective beliefs

- We observe anonymized portfolio and returns for investors managed by respondents
  - Investment level value at start and end of month
  - Total returns including income, trading profits, capital gains
  - Limited attributes about the advisor, no investor characteristics

Survey distribution

- Survey is sent out to wealth advisors at firms using the Addepar platform
  - Identify and contact executives and investment professionals
  - Includes CEOs, CIOs, Partners, Managing Directors
  - Use screening questions to identify financial advisors' rank and scope of responsibility
- A total of four waves so far (ongoing)
  - May 2022, January 2023, July 2023 linked to portfolio data
  - Survey round in February 2024 without portfolio IDs (89 respondents)
- 250 responses to date
  - 210 unique respondents: 40 have taken the survey more than once
  - 179 underlying firms, of which 175 have portfolio data in June 2023
  - Better to interpret it as a cross-sectional study (limited panel dimension so far)

Summary statistics for respondents and portfolios

- Median respondent manages 1 billion across 29 portfolios
- Average investor represented has 10.9 million across 68.5 investments
  - Investments include single stocks, ETFs, mutual funds, private equity investments, etc.

	Mean	p25	p50	p75	N
Respondent level:					
Manager AUM (millions)	2,444.5	355.1	1,032.7	2,287.7	175
Portfolios managed	223.3	10.0	29.0	171.0	175
Investor level:					
Investor AUM (millions)	10.9	0.1	0.7	3.0	39,076
Number of investments	68.5	8.0	22.0	54.0	39,076

Notes: Data as of June 30, 2023.

Frequency of communication

Survey design

1. Screening:
   - Advisory role
   - Extent of decision making capacity
2. Investment
   - Asset classes actively investing
   - Planned actions for each asset class over the next year
3. Subjective beliefs
   - Expected total nominal return over next year / 10 years (expected rate of return)
   - Required rate of return to make an investment over the next year (required rate of return)
   - Other variables such as GDP growth, inflation, recession probability, etc.

* Others
   - Asset class returns conditional on a severe recession (crash risk)
   - Risk-free rate (in some waves)

Investment questions

1. In which of the following asset classes are you actively investing?
   - US Treasuries and Agency Debt
   - US Corporate Bonds (e.g. Barclays AGG)
   - US Equities (e.g. S&P 500)
   - International Equities (e.g. MSCI World, non-US equities)
   - Hedge Funds Equity Strategies
   - Hedge Funds Multi-Strategy
   - Private Equity Buyout
   - Private Equity Venture
   - Real Estate Funds

2. Do you plan to change your allocation to the following assets over the next year? If so, how?
   - Increase / Decrease / No Change / Don't Know

Belief questions

For each asset class an investor is currently investing in or planning to invest, we ask:

1. Expected total return (nominal capital appreciation plus payouts) over the next year and the expected average (annualized) return over the next ten years
2. Minimum rate of return required to make an investment in [asset class] for one year
   - Slider between [-5, 10] for bonds; [-15, 30] otherwise
   - Clicking through the survey records the minimum values, which we discard

We interpret the minimum rate of return as the required return.

- This follows Greenwood and Shleifer (2014) interpretation of Gallup questions
  - "percentage return they expect on the market" → proxy for expectations
  - "minimum acceptable rate of return" → a measure of required returns
- Other ways to infer the required rate of return require additional assumptions
  - Couts et al. (2024) estimate required rate of return under CAPM assumption
  - Our approach is "model-free" way of eliciting required rate of return

Interpreting required rate of return, $\mathbb{R}[r^{1Y}]$

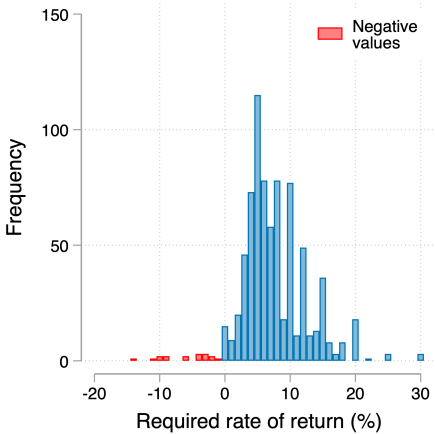
Table: Summary statistics for survey responses

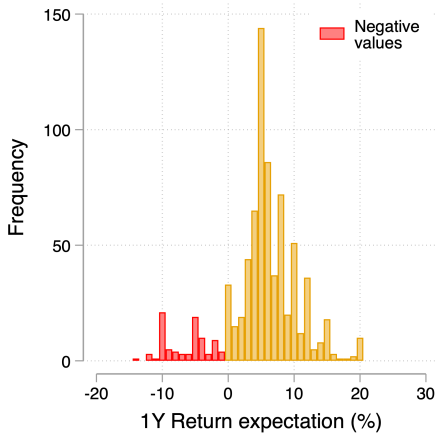
	Mean	p25	p50	p75	S.D.	N
1Y return expectation, $\mathbb{E}[r^{1Y}]$	5.2	3.0	5.0	8.0	5.6	768
10Y return expectation, $\mathbb{E}[r^{10Y}]$	8.4	5.0	8.0	10.0	4.6	768
1Y required rate of return, $\mathbb{R}[r^{1Y}]$	7.6	5.0	7.0	10.0	5.1	768

We interpret the required rate of return as a compensation for risk.

1. Very few $\mathbb{R}[r^{1Y}]$ are negative values (2%)
2. $\mathbb{R}[r^{1Y}]$ are mostly higher than reported risk-free rates
3. $\mathbb{R}[r^{1Y}]$ line up well with ex-ante perception of risk at asset class level
4. $\mathbb{R}[r^{1Y}]$ line up well with subjective perception of risk

1. Only 2% of required return responses are negative

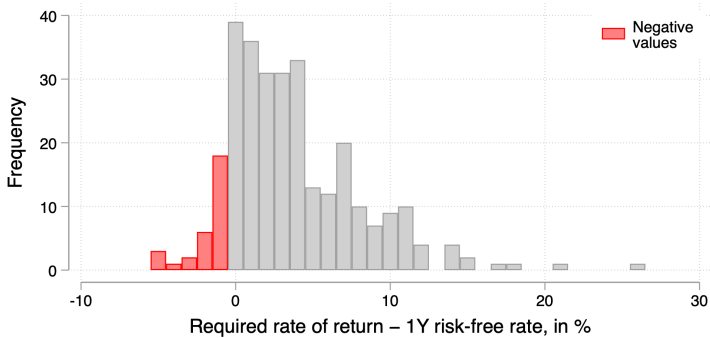




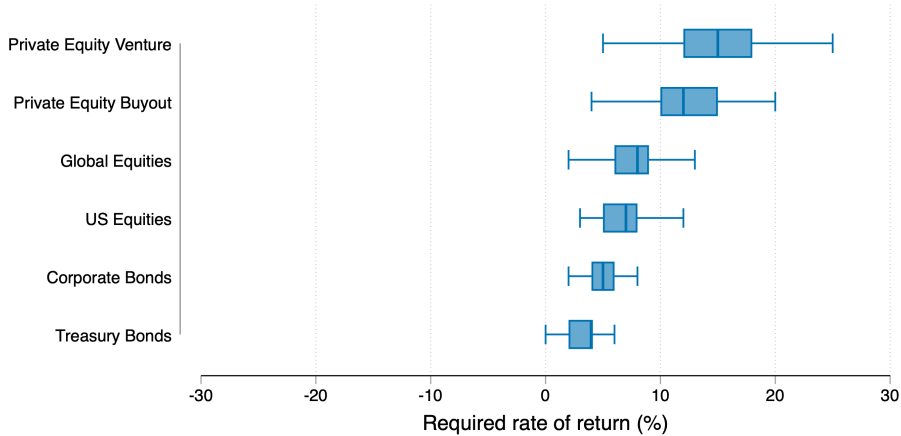
2. Required return rates are mostly higher than risk-free rates

In the third survey wave, we also ask:

- Please enter the expected total nominal return on a risk free asset (i.e. the risk-free rate), for 1 year and 10 year

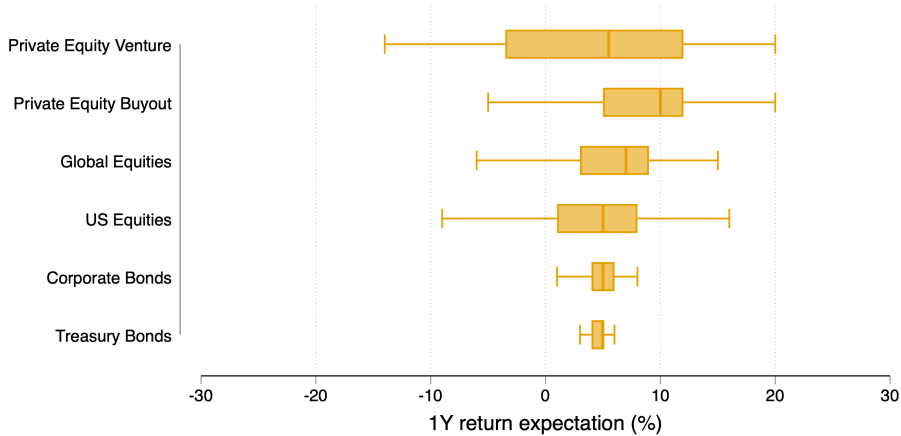


3. Required returns are higher for assets typically considered riskier



Note: We omit some asset classes here because their ex-ante risk is difficult to pin down.

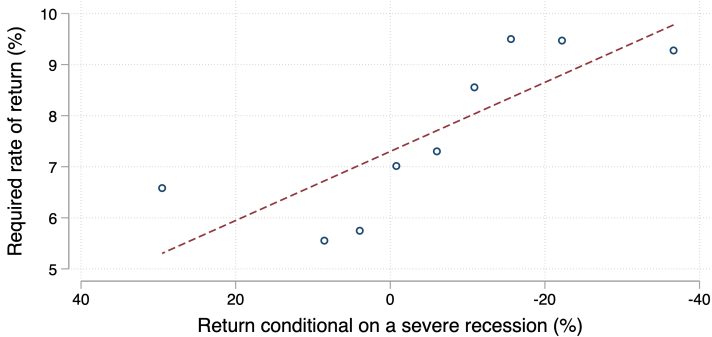
This does not hold for return expectations over the same horizon



4. Required return lines up well with perceived risk at asset class level

Respondents are also asked:

- If there were a severe recession, what market movement would you expect for the following asset classes? (−100 means a total loss in value; 100 means a doubling in value)



Fundamentals

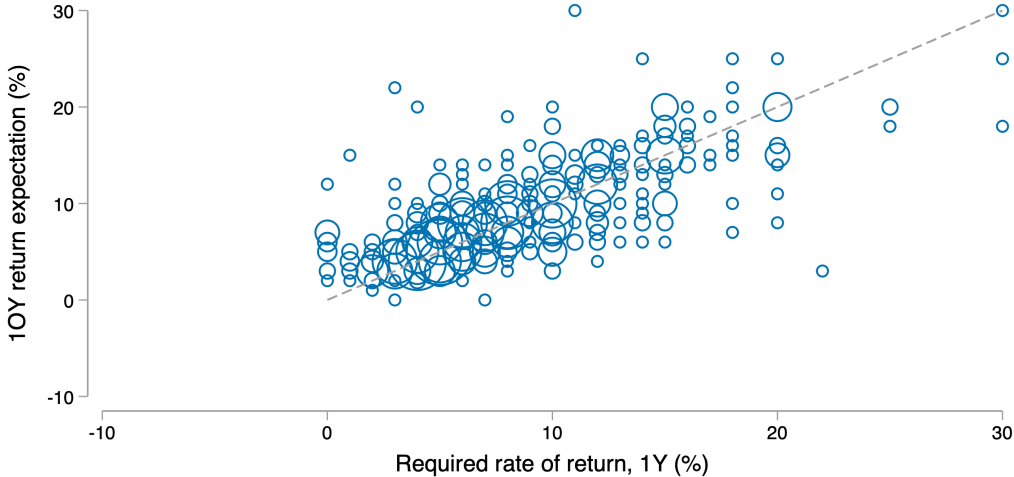
Results

Result 1: Long run vs short run return expectations

Variation in the 10-year return expectation is primarily driven by the required rate of return

1. required rate of return is highly correlated with long-term return expectation
   - 1% increase in $\mathbb{R}[r^{1Y}] \rightarrow$ 0.74% to 0.85% increase in $\mathbb{E}[r^{10Y}]$
2. in general, long-term return expectation is close in magnitude to required rate of return

$\mathbb{R}[r^{1Y}]$ is highly correlated with $\mathbb{E}[r^{10Y}]$



$\mathbb{R}[r^{1Y}]$ is highly correlated with $\mathbb{E}[r^{10Y}]$, cont'd

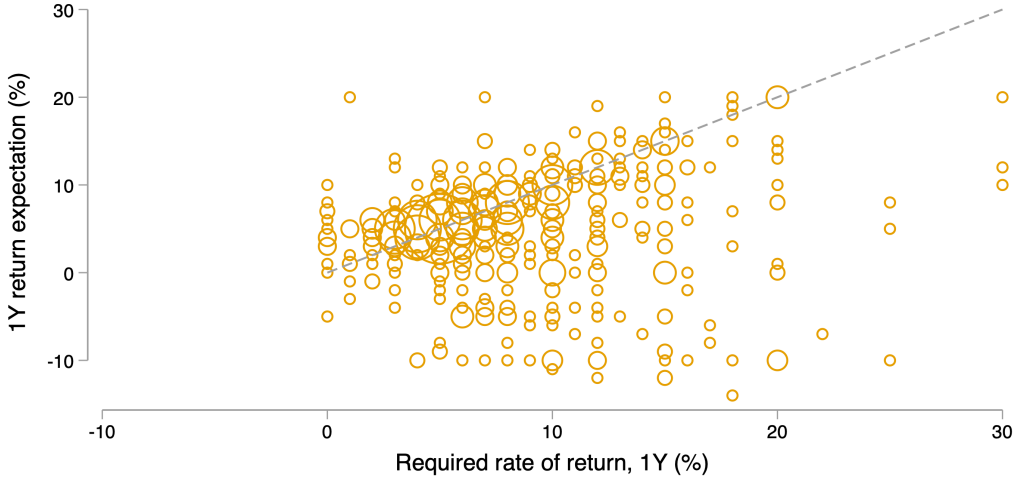
For investor i in asset class j: $\mathbb{E}[r^{10Y}]_{ijt} = \beta_0 + \beta_1 \mathbb{R}[r^{1Y}] + \varepsilon_{ijt}$

	Full sample (1)	Full sample (2)	Risky assets (3)	Equities only (4)
$\mathbb{R}[r^{1Y}]$	0.74***	0.85***	0.79***	0.83***
	(0.06)	(0.05)	(0.04)	(0.02)
Respondent×time fixed effect		Y	Y	Y
Observations	751	743	542	406
R-squared	0.57	0.78	0.77	0.80

Notes: Standard errors are clustered at the respondent level. Full sample excludes minimum responses, which may be due to respondents skipping a question. Risky assets excludes bonds. Equities only includes US Equities, Global Equities, Hedge Fund Equity Strategies, Private Equity Buyout and Venture Capital.

$\mathbb{R}[r^{1Y}]$ is weakly correlated with $\mathbb{E}[r^{1Y}]$

Variation in the 1-year return expectation is much less driven by the required rate of return



$\mathbb{R}[r^{1Y}]$ is weakly correlated with $\mathbb{E}[r^{1Y}]$, cont'd

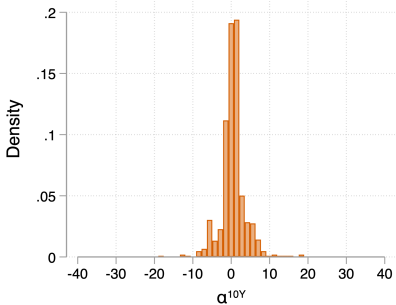
For investor i in asset class j: $\mathbb{E}[r^{1Y}]_{ijt} = \beta_0 + \beta_1 \mathbb{R}[r^{1Y}] + \varepsilon_{ijt}$

	Full sample (1)	Full sample (2)	Risky assets (3)	Equities only (4)
$\mathbb{R}[r^{1Y}]$	0.16**	0.16*	0.13	0.13
	(0.08)	(0.11)	(0.19)	(0.19)
Respondent×time fixed effect		Y	Y	Y
Observations	751	743	542	406
R-squared	0.02	0.41	0.49	0.58

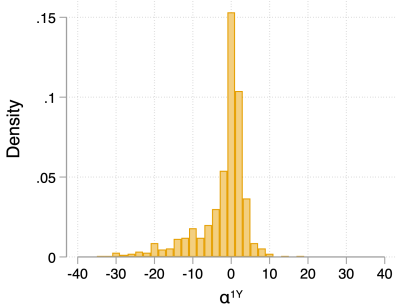
Notes: Standard errors are clustered at the respondent level. Full sample excludes minimum responses, which may be due to respondents' skipping a question. Risky assets excludes bonds. Equities only includes US Equities, Global Equities, Hedge Fund Equity Strategies, Private Equity Buyout and Venture Capital.

Gap between expected and required returns, i.e. “subjective alpha"

$$\alpha^{10Y} = \mathbb{E}[r^{10Y}] - \mathbb{R}[r^{1Y}]$$

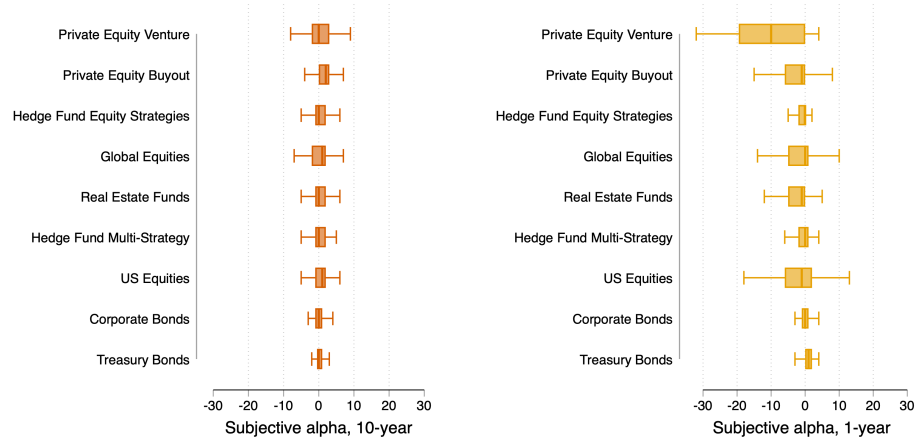


$$\alpha^{1Y} = \mathbb{E}[r^{1Y}] - \mathbb{R}[r^{1Y}]$$



Investors’ return expectation deviate from required returns, by more in short than long run

10-year alpha is close to zero for all asset classes



Next slide: variance decomposition of return expectation

Across rounds

Variance decomposition (Couts et al., 2024)

Taking variance of both sides of $\mathbb{E}[r] = \mathbb{R}[r] + \alpha$:

$$\text{Var}[\mathbb{E}[r]] = \text{Cov}[\mathbb{E}[r], \mathbb{R}[r]] + \text{Cov}[\mathbb{E}[r], \alpha]$$

rearranging allows us to decompose variance in $\mathbb{E}[r]$ into:

$$1 = \underbrace{\frac{\text{Cov}[\mathbb{E}[r], \mathbb{R}[r]]}{\text{Var}[\mathbb{E}[r]]}}_{\text{\% from risk premia}} + \underbrace{\frac{\text{Cov}[\mathbb{E}[r], \alpha]}{\text{Var}[\mathbb{E}[r]]}}_{\text{\% from alpha}}$$

where:

- $\frac{\text{Cov}[\mathbb{E}[r], \mathbb{R}[r]]}{\text{Var}[\mathbb{E}[r]]}$ is the coefficient from a regression of $\mathbb{R}[r]$ on $\mathbb{E}[r]$
- $\frac{\text{Cov}[\mathbb{E}[r], \alpha]}{\text{Var}[\mathbb{E}[r]]}$ is the coefficient from a regression of α on $\mathbb{E}[r]$
- Account for fixed effects (e.g. dates, advisors) to remove variation explained by those
- Explore both long-run and short-run return expectations

In the long-run, most variation comes from risk premia

- Most variability in $\mathbb{E}[r^{10Y}]$ comes from $\mathbb{R}[r^{1Y}]$ (with asset class f.e.s, around half)
- Across asset classes, most of variation comes from risk premia
- Across advisors or dates, variation comes equally from risk premia and alpha

Identification from variation across	Multiple Sources				Assets		Advisors		Dates	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
% of $\mathbb{E}[r^{10Y}]$ variation from $\mathbb{R}[r^{1Y}]$	77	77	78	53	78	78	54	53	49	51
% of $\mathbb{E}[r^{10Y}]$ variation from a^{10Y}	23	23	22	47	22	22	46	47	51	49
Date fixed effects		Y			Y		Y			
Advisor fixed effects			Y		Y				Y	
Asset class fixed effects				Y			Y		Y	
Date×Advisor fixed effects						Y				
Date×Asset class fixed effects								Y		
Advisor×Asset class fixed effects										Y

In the short-run, almost all the variation comes from alpha

Identification from variation across	Multiple Sources				Assets		Advisors		Dates	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Long run return expectation										
% of $\mathbb{E}[r^{10Y}]$ variation from $\mathbb{R}[r^{1Y}]$	77	77	78	53	78	78	54	53	49	51
% of $\mathbb{E}[r^{10Y}]$ variation from α^{10Y}	23	23	22	47	22	22	46	47	51	49
Short run return expectation										
% of $\mathbb{E}[r^{1Y}]$ variation from $\mathbb{R}[r^{1Y}]$	11	15	10	6	10	10	9	8	5	2
% of $\mathbb{E}[r^{1Y}]$ variation from α^{1Y}	89	85	90	94	90	90	91	92	95	98
Date fixed effects		Y			Y		Y			
Advisor fixed effects			Y		Y				Y	
Asset class fixed effects				Y			Y		Y	
Date×Advisor fixed effects						Y				
Date×Asset class fixed effects								Y		
Advisor×Asset class fixed effects										Y

Result 1: drivers of long and short-run return expectation

Implications:

1. Long-term return expectations are primarily driven by risk premium
2. Short-term return expectations are primarily driven by subjective alpha

Result 2: Beliefs and stated plans

Survey question:

- Do you plan to change your allocation to the following assets over the next year? If so, how?
  - Increase / Decrease / No Change / Don't Know

We examine how beliefs affect stated plans to change allocations, and show:

1. Higher return expectations are associated with stated intention of buying
2. Intention of buying is driven by subjective alpha, rather than risk compensation

Beliefs and stated plans

Table: Summary statistics by stated plans, asset class × respondent level

Stated action	$\mathbb{E}[r^{1Y}]$	$\mathbb{E}[r^{10Y}]$	$\mathbb{R}[r^{1Y}]$	α^{1Y}	α^{10Y}	N
Increase	6.1	8.8	7.8	-1.7	1.0	345
No Change	5.1	8.3	7.6	-2.5	0.7	263
Decrease	3.0	7.5	8.8	-5.8	-1.4	117
Increase - *Decrease*	3.1	1.3	-1.0	4.1	2.4	

- Plans to buy have higher return expectations and alphas; plans to sell have lower
- Required return is slightly lower for assets where respondents plan to increase
- On average, difference in 1Y return expectation between increase and decrease is 3.1%

Regression tests: plans to increase allocations

Dummy dependent variable: Plan to increase

	(1)	(2)	(3)	(4)
$\mathbb{E}[r^{1Y}]$	0.016***			
	(0.005)			
$\mathbb{E}[r^{10Y}]$			0.002	
			(0.010)	
$\mathbb{R}[r^{1Y}]$		-0.015*		-0.017*
		(0.008)		(0.010)
α^{1Y}		0.018***		
		(0.005)		
α^{10Y}				0.022*
				(0.011)
Asset class fixed effects	Y	Y	Y	Y
Respondent fixed effects	Y	Y	Y	Y
Observations	743	743	743	743
R-squared	0.32	0.34	0.30	0.32

Notes: Standard errors clustered at the respondent level.

W/ asset class and respondent f.e.s:

- One pp increase in 1Y return expectation is associated with an 1.6% increase in probability of planning to increase
- This is mostly driven by subjective alpha: required return has opposite sign
- 10Y return expectation is not associated with plans, however, long-run subjective alpha is associated with plans to increase

Regression tests: plans to decrease allocations

Dummy dependent variable: Plan to decrease

	(1)	(2)	(3)	(4)
$\mathbb{E}[r^{1Y}]$	-0.013***			
	(0.004)			
$\mathbb{E}[r^{10Y}]$			-0.012	
			(0.008)	
$\mathbb{R}[r^{1Y}]$		0.014**		0.006
		(0.006)		(0.008)
α^{1Y}		-0.014***		
		(0.004)		
α^{10Y}				-0.031***
				(0.009)
Asset class fixed effects	Y	Y	Y	Y
Respondent fixed effects	Y	Y	Y	Y
Observations	743	743	743	743
R-squared	0.28	0.31	0.26	0.30

Notes: Standard errors clustered at the respondent level.

W/ asset class and respondent f.e.s:

- One pp increase in 1Y return expectation is associated with an 1.3% decrease in probability of planning to decrease
- Again, this is mostly driven by subjective alpha: required return has opposite sign
- 10Y return expectation is not associated with plans, however, long-run subjective alpha is negatively associated with plans to decrease

Result 2: beliefs and stated plans

Implications:

1. Subjective alphas drive planned changes to portfolios
   - Higher subjective alpha is associated with more plans to buy
   - Lower subjective alpha is associated with more plans to sell
2. Difference in actions (buy - sell) is associated with a difference in subjective alpha of 3%
   - A one percentage point increase in α^{1Y} is associated with
     - 1.8% higher probability of planning to buy
     - 1.4% lower probability of planning to sell
     - $1.8 - (-1.4) = 3.2\%$

Result 3: beliefs and portfolio data

We link survey responses to portfolio data:

- Median respondent manages 1 billion across 29 portfolios; portfolios are active
- For portfolio shares ω_{ijt}, examine
  - Overall change = $\frac{\omega_{ijt}}{\omega_{ij,t-1}} - 1$ and active change
  - We only look at the quarter after the survey, for now
- For each respondent, we calculate value-weighted averages across managed portfolios

Using portfolio data, we show:

1. On average, respondents follow through on stated plans
2. This links subjective alpha to portfolio changes

Asset class breakdown | Portfolio share regression

Portfolios change according to plan: overall changes

Table: Overall change in asset-class share, one quarter after survey (%)

Stated action	Mean	p25	p50	p75	SD	N
Increase	-0.0	-5.5	-0.3	4.1	16.1	285
No Change	-1.2	-4.1	-0.0	2.6	10.3	248
Decrease	-2.3	-5.7	-1.1	1.2	13.7	82
Increase - *Decrease*	2.3	0.2	0.8	2.9	2.4	

Notes: This is calculated as the value-weighted growth rate of the share, across portfolios managed by each respondent. The observations are at the respondent-asset class-date level, and condition on respondents who also provided return expectations. This includes changes in asset class shares that are driven by valuation, if advisors are not actively rebalancing.

- Increase - Decrease difference in change in portfolio share of 2.3 percent
- Increase - Decrease difference in subjective alpha of 3.2 percent
- Implied sensitivity of trading to alphas $\approx 2.3/3.2 = 0.7$

Active change

Regression tests: % overall change (t to $t+1$)

Dependent variable: % overall change in asset class share (t to $t+1$)

	(1)	(2)	(3)	(4)
$\mathbb{E}[r^{1Y}]$	0.30**			
	(0.12)			
$\mathbb{E}[r^{10Y}]$			-0.04	
			(0.43)	
$\mathbb{R}[r^{1Y}]$		0.38*		0.11
		(0.20)		(0.48)
α^{1Y}		0.31***		
		(0.12)		
α^{10Y}				0.79**
				(0.38)
Asset class fixed effects	Y	Y	Y	Y
Respondent fixed effects	Y	Y	Y	Y
Observations	625	586	686	611
R-squared	0.38	0.40	0.34	0.40

Notes: Changes in shares are value-weighted averages of the overall change in share, across portfolios managed by the same respondent. Regression observations are weighted by AUM. Standard errors clustered at the respondent level.

W/ asset class and respondent f.e.s:

- One pp increase in short-run subjective alpha is associated with an 0.3% increase in the change in asset class share j
- One pp increase in long-run subjective alpha is associated with 0.8% increase in the change in asset class share
- Average change in asset-class share is 1.6%, so these changes are economically significant

Active change regression

Result 3: beliefs and portfolio data

Implications:

1. Portfolio changes evolve according to planned changes
2. Subjective alpha drives planned changes, and thus actual changes
3. Our results indicate a higher sensitivity of trading to beliefs than in Giglio et al. (2021)
   - This is despite measuring advisor beliefs and investor portfolios
   - However, our results are based on cross-section and short post-survey window for now

Conclusion

Understanding what return expectations reflect is central to linking beliefs and portfolios:

- We design a survey to elicit both subjective risk premia and subjective alpha
- Show that these components affect beliefs and actions differently

Summary:

1. Subjective risk premia drive long-run return expectation
2. Subjective alpha drives short-run return expectation
3. Subjective alpha also drives planned changes to portfolios and actual portfolio decisions

Appendix

Related literature

1. Survey evidence on subjective return expectation focuses largely on either:
   - Retail investors (Gnan and Schleritzko, 2023; Bender et al., 2022)
   - Institutional investors (Bastianello and Peng, 2024; Couts et al., 2024)

2. Limited studies that can link survey evidence to portfolio data
   - Retail investors (Giglio et al., 2021)
   - Institutional investors (Dahlquist and Ibert, 2023)

3. Financial advisors:
   - Exert substantial influence with limited customization (Foerster et al., 2017)
   - Beliefs they hold are reflected in investors' portfolios (Linnainmaa et al., 2021)

Frequency of communication and decision power

Table: Self-reported decision power (%)

Frequency of communication	Decision power (%) Mean	Median	AUM (millions) Mean	Median	N
Frequently	83	89	1,689	737	94
Often	67	70	3,299	1,240	25
Sometimes	45	50	623	540	19
Infrequently	21	10	1,892	957	13
Never	9	1	3,731	965	14
Total	65	75	1,999	774	165

Comparison to Giglio et al. (2021)

Five facts:

1. Beliefs are reflected in portfolio allocations, with low sensitivity
2. Belief changes do not predict when investors trade, but conditional on trading, they affect both the direction and the magnitude of trades
3. Beliefs are mostly characterized by large and persistent individual heterogeneity
4. Expected cash flow growth and return expectation are positively related
5. Return expectation and the subjective probability of rare disasters are negatively related

Our evidence is consistent with facts 1-3, and in our data:

- In the short run, expected cash flow growth and return expectation are positively related, but expected cash flow growth and required returns are negatively related
  - Expected cash flow growth associated with higher subjective alpha (1Y)
- In the long run, no relationship between expected cash flow and required return or return expectation
- Respondents with higher expected probability of recession have lower short-run subjective alpha, and no higher required return or long-run subjective alpha

Cash flow growth and return expectation, short-run

	$\mathbb{E}[r^{1Y}]$	$\mathbb{R}[r^{1Y}]$	α^{1Y}
	(1)	(2)	(3)
$\mathbb{E}[GDP]^{1Y}$	0.36***	-0.26***	0.62***
	(0.11)	(0.05)	(0.12)
Asset class fixed effects	Y	Y	Y
Round fixed effects	Y	Y	Y
Observations	709	709	709
R-squared	0.13	0.53	0.30

Notes: Robust standard errors.

- Return expectation positively correlated with expected GDP growth
- However, required returns negatively correlated (lower discount rate)
- Subjective alpha highly positively correlated

Cash flow growth and return expectation, long-run

	$\mathbb{E}[r^{10Y}]$	$\mathbb{R}[r^{1Y}]$	α^{10Y}
	(1)	(2)	(3)
$\mathbb{E}[GDP]^{10Y}$	0.47**	0.13	0.34*
	(0.22)	(0.11)	(0.18)
Asset class fixed effects	Y	Y	Y
Round fixed effects	Y	Y	Y
Observations	719	719	719
R-squared	0.62	0.52	0.08

Notes: Robust standard errors.

- In the long run, no correlation with required return
- Subjective alpha correlation is smaller, borderline significant

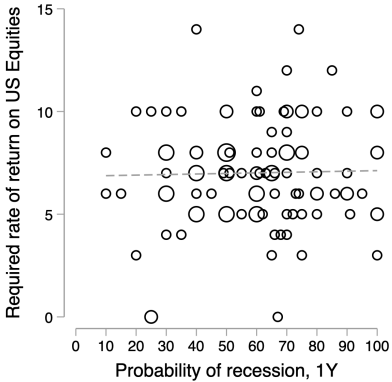
Return expectation and the subjective probability of a recession

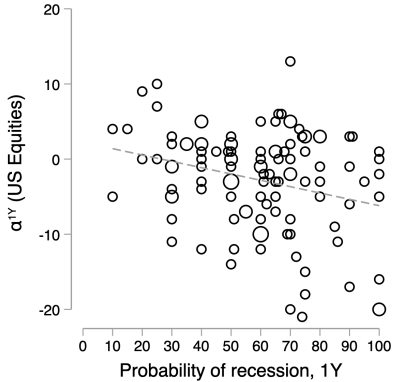
	$\mathbb{R}[r^{1Y}]$		α^{1Y}		α^{10Y}	
	(1)	(2)	(3)	(4)	(5)	(6)
P(recession)	-0.001	-0.002	-0.05***	-0.05***	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Asset class fixed effects	Y	Y	Y	Y	Y	Y
Round fixed effects		Y		Y		Y
Observations	743	743	743	743	743	743
R-squared	0.51	0.52	0.22	0.29	0.03	0.06

Notes: Robust standard errors.

In the cross-section, respondents who expect a recession with higher probability do not have higher required returns. They do however have lower subjective alpha.

Recession probability and return expectation: US Equities

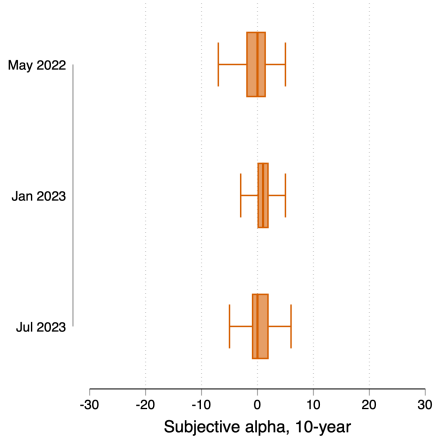


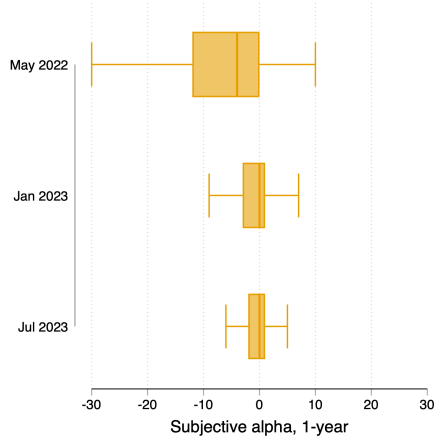


Comparison to Gnan and Schleritzko (2023)

- Uses Gallup/UBS Investor Optimism Index (1988-2003)
- US households that actively participate in financial markets with a minimum portfolio size of $10,000
- Highlight differences between expected and required returns
  - Expected stock market return is measured directly (overall rate of return)
  - Stock market valuation question (overvalued/valued about right/undervalued) is used to infer required returns
  - For households with the same return expectations, those who perceive the market price as too high must have a higher required return
- Show that *required returns* increase with perceptions of stock market risk
- Risk-return tradeoff is stronger for financially literate investors and during times of economic distress

10-year alpha is close to zero in all survey rounds





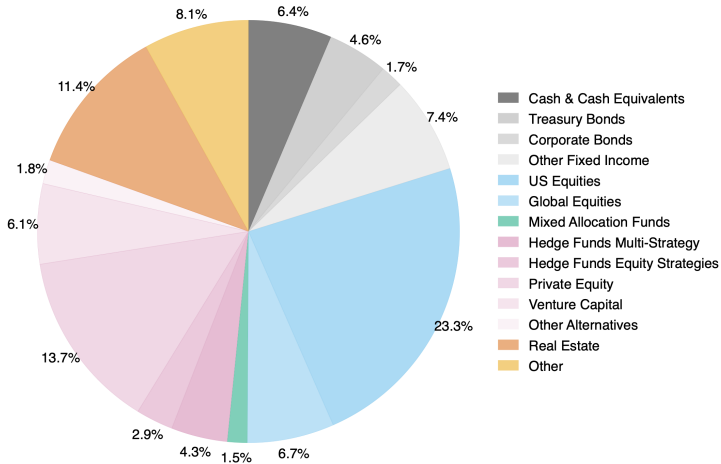
Long-run result is extremely similar to Couts et al. (2024)

Risk premia in Couts et al. (2024) calculated as the product of institutions' return expectation and β calculated from covariances

Identification from Variation Across =	**Multiple Sources**				**Asset Classes**		**Institutions**		**Years**	
	[1]	**[2]**	**[3]**	**[4]**	**[5]**	**[6]**	**[7]**	**[8]**	**[9]**	**[10]**
Equity CAPM										
% of μ Variation from Risk Premia	76%	76%	76%	52%	77%	77%	50%	47%	47%	49%
% of μ Variation from Alphas	24%	24%	24%	48%	23%	23%	50%	53%	53%	51%
Pension CAPM										
% of μ Variation from Risk Premia	91%	91%	91%	63%	92%	92%	62%	56%	56%	61%
% of μ Variation from Alphas	9%	9%	9%	37%	8%	8%	38%	44%	44%	39%
Year Fixed Effect		x			x		x			
Institution Fixed Effect			x		x				x	
Asset Class Fixed Effect				x			x		x	
Year × Institution Fixed Effect						x				
Year × Asset Class Fixed Effect								x		
Institution × Asset Class Fixed Effect										x

Survey categories map to 3/4 of portfolio value, on average

Figure: Breakdown of managed portfolios' asset allocations, 2022



Mapping stated plans to actions

For investor i in time t, ω_{ijt} is the share of asset class j in the portfolio

- Subjective risk premia drives existing portfolio shares (in the cross section)

Active portfolio changes measure effect of buys/sells on asset-class shares:

$$\text{Active change}_{ijt} = \frac{\omega_{ijt}}{\omega_{ijt}^{CF}} - 1$$

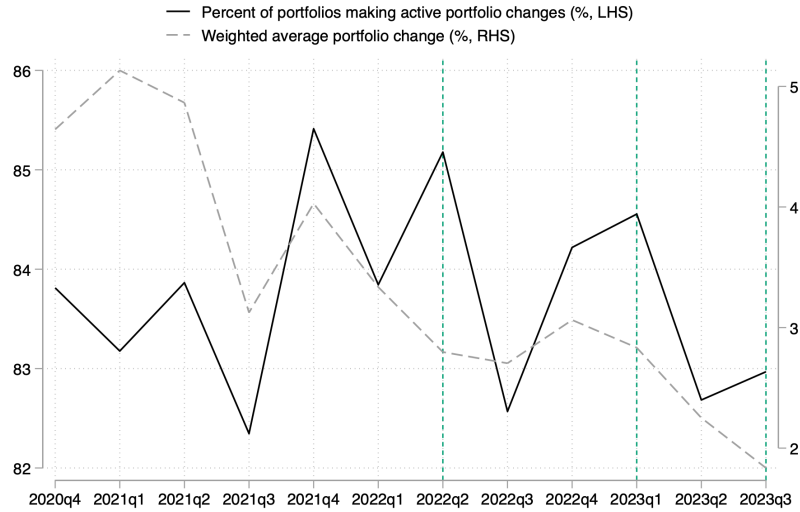
where ω_{ijt}^{CF} is what the share would have been without any buys or sells (i.e. due to valuation)

Overall changes include the effect of valuation changes

$$\text{Overall change}_{ijt} = \frac{\omega_{ijt}}{\omega_{ij,t-1}} - 1$$

On average, most portfolios are active in each quarter

84 percent of portfolios make some active change (e.g. buy, sell); average change is 3.4% of portfolio value



Regression tests: Value-weighted portfolio share at t (mean: 15.9%)

Dummy dependent variable: Portfolio share at t

	(1)	(2)	(3)	(4)
$\mathbb{E}[r^{1Y}]$	-0.16			
	(0.22)			
$\mathbb{E}[r^{10Y}]$			-0.38	
			(0.47)	
$\mathbb{R}[r^{1Y}]$		-1.63**		-1.68**
		(0.77)		(0.70)
α^{1Y}		-0.10		
		(0.18)		
α^{10Y}				-0.29
				(0.50)
Asset class fixed effects	Y	Y	Y	Y
Respondent fixed effects	Y	Y	Y	Y
Observations	680	639	761	670
R-squared	0.65	0.66	0.65	0.66

Notes: Portfolio shares are value-weighted averages across portfolios managed by the same respondent. Regression observations are weighted by AUM. Standard errors clustered at the respondent level.

Portfolios change according to plan: active changes

Table: Active change in asset-class share, one quarter after survey (%)

Stated action	Mean	p25	p50	p75	SD	N
Increase	2.1	-0.6	-0.0	1.1	16.1	285
No Change	0.3	-0.7	0.0	0.6	9.9	248
Decrease	-0.6	-1.1	-0.0	0.1	19.3	82
Increase - *Decrease*	2.7	0.5	0.0	1.0	3.2	

Notes: This is calculated as the value weighted average of the deviations in asset class share from a counterfactual in which no active changes are made to holdings, across portfolios managed by each respondent. The observations are at the respondent-asset class-date level, and condition on respondents who also provided return expectations.

Regression tests: % active change (t to $t+1$)

Dependent variable: % change in asset class share (t to $t+1$)

	(1)	(2)	(3)	(4)
$\mathbb{E}[r^{1Y}]$	0.07			
	(0.04)			
$\mathbb{E}[r^{10Y}]$			-0.03	
			(0.33)	
$\mathbb{R}[r^{1Y}]$		-0.01		-0.53
		(0.15)		(0.66)
α^{1Y}		0.09*		
		(0.05)		
α^{10Y}				0.78*
				(0.41)
Asset class fixed effects	Y	Y	Y	Y
Respondent fixed effects	Y	Y	Y	Y
Observations	625	586	686	611
R-squared	0.56	0.55	0.38	0.40

Notes: Changes in shares are value-weighted averages of the active change in share, across portfolios managed by the same respondent. Regression observations are weighted by AUM. Standard errors clustered at the respondent level.

Implications

Three types of disagreements for investors $i = A, B$:

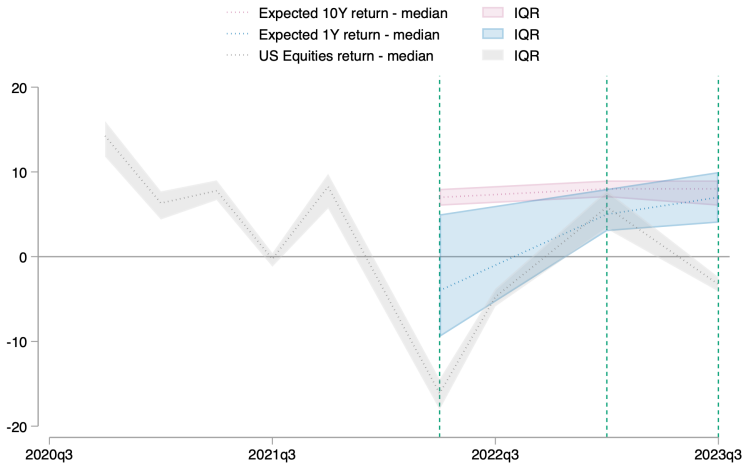
1. Agree to disagree
   - $\mathbb{E}[r]_A = \mathbb{R}[r]_A \neq \mathbb{E}[r]_B = \mathbb{R}[r]_B$
   - Although return expectation differs, no trading
2. Disagreement about mispricing
   - $\mathbb{E}[r]_A > \mathbb{E}[r]_B$, $\mathbb{R}[r]_A = \mathbb{R}[r]_B$
   - Although return expectation differs, no trading unless subjective alphas have opposite sign
3. Disagreement about risk
   - $\mathbb{E}[r]_A = \mathbb{E}[r]_B$, $\mathbb{R}[r]_A > \mathbb{R}[r]_B$
   - Return expectation is the same, but trading occurs if subjective alphas have opposite sign

Implications:

- Depending on the nature of disagreement, there is:
  - Lower sensitivity of trading to beliefs in empirical regressions on return expectations (agree to disagree, disagreement about mispricing)
  - More variation in trading than is explained by return expectation (disagreement about risk)

What drives belief-formation?

(Past experiences? Past observations? etc.)



Past returns and expectations

Dependent variable:	Expected 1Y return		Expected 10Y return		Discount rate	
	(1)	(2)	(3)	(4)	(5)	(6)
Past return	0.194	0.132	-0.174	-0.189	-0.355*	-0.328
	(0.251)	(0.231)	(0.137)	(0.137)	(0.206)	(0.208)
Asset class fixed effects	Y	Y	Y	Y	Y	Y
Time fixed effects		Y		Y		Y
Observations	620	620	695	695	635	635
R-squared	0.05	0.13	0.61	0.61	0.40	0.41

Notes: Return is over the 12 months prior to the survey at the asset class level, winsorized at the top and bottom 0.5 percent, and then standardized to have mean 0 and standard deviation 1 within each asset class and date.

Summary statistics

	Mean	p25	p50	p75	S.D.	N
Asset class level:						
$\mathbb{E}[r^{1Y}]_{ijt}$	5.3	3	5	8	5.7	943
$\mathbb{E}[r^{10Y}]_{ijt}$	8.5	5	8	10	4.6	1042
$\mathbb{R}[r^{1Y}]$	7.7	5	7	10	5.1	953
$\mathbb{E}[r_{ij}\|Recession]$	-10.4	-20	-10	0	17.6	966
Economy level:						
$\mathbb{E}[\text{GDP}^{1Y}]_{ijt}$	1.4	0	2	3	2.2	154
$\mathbb{E}[\text{GDP}^{10Y}]_{ijt}$	3.0	2	3	3	1.4	157
$\mathbb{E}[\text{Inflation}^{1Y}]_{ijt}$	4.5	4	4	5	1.8	161
$\mathbb{E}[\text{Inflation}^{10Y}]_{ijt}$	2.9	2	3	3	1.3	162
$P(recession)^{1Y}_{it}$	58.4	50	60	70	20.1	170

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