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Understanding the formation of consumers' stock market expectations

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Abstract

To understand consumers' investment decisions, national surveys such as the Health and Retirement Study elicit consumers' expectations about stock market movements. Analyses of stock market expectations show substantial heterogeneity between consumers. It is commonly speculated that this heterogeneity reflects variations in the beliefs underlying consumers' stock market expectations, that is, their "mental models." In an online survey of American adults, we find that consumers think about different economic and political issues when generating stock market expectations for the next year. Regardless of the specific issues on which consumers focused, however, their assessments of the issues seemed to reflect a single underlying perception of changes in economic conditions. Regression analyses show that variation in stock market expectations is related to consumers' overall assessments of economic developments. We discuss the implications of these results for economic surveys and investment communications.

Keywords: stock market expectations, expectations formation, consumer surveys

UNDERSTANDING THE FORMATION OF CONSUMERS' STOCK MARKET EXPECTATIONS

Consumers making investment decisions face uncertainty regarding stock market returns. Classic models of portfolio choice predict that investment decisions depend, among other factors, on estimates of expected investment returns (Markowitz, 1952; Sharpe 1964). Thus, in order to understand consumers' investment decisions, surveys have aimed to elicit consumers' stock market expectations. Research exploring the validity of reported stock market expectations has found that expectations and investment behaviors correlate in meaningful ways. For instance, average investor expectations predict aggregate inflows into mutual funds (Greenwood and Shleifer, 2014). On an individual level, consumers who have more optimistic beliefs about stock market returns are more likely to hold stock market assets (Dominitz and Manski, 2007; Hurd, 2009; Hurd, Van Rooij, and Winter, 2011) and have a higher proportion of their portfolio in stocks (Vissing-Jorgenson, 2003). Perhaps more importantly, stock market expectations also predict future behavior. In one longitudinal study, Dutch households were surveyed in 2004 and 2006 about their stock market expectations and stock market holdings. Those who were more optimistic in 2004 were more likely to newly acquire stocks by 2006 than those who were less optimistic (Hurd, Van Rooij, and Winter, 2011). Such findings have led to suggestions that, in order "to understand stock holdings, we should study the determinants of stock market expectations" (Hurd, 2009, 555).

In exploring individual differences in consumers' expectations, researchers have uncovered substantial heterogeneity. Specifically, research has documented more optimistic expectations among younger adults (Dominitz and Manski, 2007), men (Dominitz and Manski, 2007, 2011; Kézdi and Willis, 2008), people with higher educational attainment (Dominitz and Manski, 2011), people who are married (Dominitz and Manski, 2007), and those with higher

earnings (Kézdi and Willis, 2011). Additionally, studies have shown heterogeneity over time (Dominitz and Manski, 2011; Hoffman, Post, and Pennings, 2015; Weber, Weber, and Nosić, 2013). The primary explanation for heterogeneity in stock market expectations is that consumers access and process information in different ways when forming their expectations (e.g., Dominitz and Manski, 2011; Hurd, 2009; Manski, 2004). For instance, Dominitz and Manski (2011) suggest that people may have different underlying "mental models" or sets of beliefs regarding how previous stock market movements are related to future returns. To date, however, there has been no research to directly examine the mental models that consumers apply when generating their stock market expectations.

In this paper, we use an adapted "mental models" approach to better understand how consumers form their stock market expectations (Morgan, Fischhoff, Bostrom, and Atman, 2001). Specifically, we examine what issues people consider when forming their expectations and how beliefs about these issues are correlated to stock market expectations. Studies based on the mental models approach have successfully been used to understand how people form expectations in other domains. In particular, Bruine de Bruin et al. (2010) asked consumers to report their thoughts while generating expectations for inflation rates. The results showed that some participants thought about general indicators of inflation, such as the national inflation rate, while others relied more on their personal experiences with prices (Bruine de Bruin et al., 2010). Subsequent research found that these differential thought processes explained heterogeneity in responses, such that those who thought about personal price experiences also expected more extreme price changes (Bruine de Bruin et al., 2012; Bruine de Bruin, van der Klaauw, and Topa, 2011). By surveying consumers about their stock market expectations, we aim to similarly reveal consumers' thoughts when forming their stock market expectations.

Current Research

We explore what consumers think about when generating expectations for stock market movements. To do so, we first elicit stock market expectations using a question that has been administered on the Health and Retirement Study, a nationally representative survey of older adults, since 2002 (see Method). We then ask the following research questions: 1) which economic and political issues are most likely to come to mind when answering the question? and 2) how do consumers' assessments of these issues relate to stock market expectations?

METHOD

Sample

We conducted an online survey using RAND's American Life Panel (ALP) (https://mmicdata.rand.org/alp/), a sample of U.S. adults aged 18 an over who respond to surveys for pay. The survey was open from December 5, 2013 to December 22, 2013. We recruited 234 participants aged 18 to 61. Sixteen of these participants skipped one of our focal questions. We dropped these individuals from the sample, leaving a total of 218 participants. This final sample included adults who were 43.7 years old on average (SD = 11.9), with a median household income between $40,000 and $49,999. In total, 53.2% of these participants were married, 57.3% were women and 33.0% had a bachelor's degree.

Measures

Stock Market Expectations

Participants were asked to indicate their stock market expectations in response to the HRS question "By next year at this time, what is the percent chance that mutual fund shares

invested in blue chip stocks like those in the Dow Jones Industrial Average will be worth more than they are today?" Responses were provided by filling in a number between 0% and 100%.[1] Participants who attempted to skip this question or any subsequent question were shown a prompt encouraging them to provide an answer, though they could decline to answer if they wished.

Thoughts When Forming Stock Market Expectations

Following procedures from previous work aimed at understanding consumers' inflation expectations (Bruine de Bruin et al., 2010), we asked participants to identify the thoughts they considered when giving their stock market expectations ("When giving your answer, which of the following did you think about *at all*? Please check all that apply.") The following options were presented in a fixed order: "The state of the economy," "The unemployment rate," "Interest rates on savings and investments," "Interest rates on loans and mortgages," "Prices," "Economic policies," and "Political developments." These issues came from interviews in which we asked consumers to think aloud when generating stock market expectations (following Morgan et al., 2001). For each issue, respondents checked a box to indicate they had thought of it.

Assessments of Expected Improvements or Declines

Next, participants were asked to assess how much they thought each of the issues mentioned above would improve or decline in a year. For example, for "the state of the economy," participants were asked, "What do you think the state of the economy will be in the

[1] Following standard practice on the HRS, participants received a short explanation of the response scale as an introduction to this stock market question. This explanation read, "The next question asks you to give a number from 0% to 100%, where '0%' means that you think there is absolutely no chance, and '100%' means that you think the event is absolutely sure to happen."

next year, compared to now?" (1 = A lot worse, 2 = Mostly worse, 3 = About the same, 4 = Mostly better, 5 = A lot better). Questions about the other issues used parallel wording, such that higher values signified improvements.

RESULTS

Stock Market Expectations

On average, participants reported a 45.7% chance (*SD* = 24.9) that the stock market would increase over the next year. The full distribution of responses is shown in Figure 1. It is similar to distributions reported in previous research (e.g., Dominitz and Manski, 2007).[2]

[Insert Figure 1 about here]

Thoughts When Forming Stock Market Expectations

Table 1 presents the percentage of participants who reported thinking about each issue when forming their stock market expectations, listed in descending frequency. As shown, the prevalence of these issues varied considerably, from 73.4% of participants reporting that they thought about "the state of the economy" to 29.8% saying that they considered "interest rates on loans and mortgages." Participants reported 2.7 issues (*SD* = 2.0) on average. However, 40.4% reported thinking about only one issue in the process of generating their expectation and 8.3% reported considering all seven.[3]

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[2] As in previous research (e.g., Dominitz and Manski, 2007), the distribution shows a seemingly disproportionate number of participants who said that there was a 50% chance of a stock market increase (28.0% of the sample), a response that may indicate uncertainty (Bruine de Bruin and Carman, 2012; Fischhoff and Bruine de Bruin, 1999). Removing participants with an expectation of 50% from the regression results presented later results in a positive estimate for the relationship between assessments of changes in economic conditions and stock market expectations; specifically, the estimate for assessments is $B = 12.6$, $se = 3.53$, $p < .001$.

[3] We conducted an exploratory factor analysis on the incidence of the thoughts. This analysis resulted in two factors. The first factor (eigenvalue = 3.71) loaded on prices, the unemployment rate, interest rates on savings and investments, and interest rates on loans and mortgages, and the second (eigenvalue = 1.13) loaded on the remaining

[Insert Table 1 about here]

Assessments of Expected Improvements or Declines

Table 1 also shows the average assessments for each of the issues, and their correlation with stock market expectations. On average, participants were most pessimistic about changes in prices over the next year (M = 2.42) and most optimistic about changes in the unemployment rate (M = 2.95). Table 2 displays correlations between assessments of the issues, which vary between .42 and .81. In order to explore possible commonalities in these assessments, we performed an exploratory factor analysis using R's "psych" package (version 1.5.4). We used oblique (promax) rotation as recommended by Fabrigar et al. (1999) to compare one, two, and three factor solutions. This analysis resulted in a single underlying factor (eigenvalue = 4.26) that accounted for 54.6% of the variance (with all factor loadings ≥ .63) and presumably reflected overall assessments of economic developments. We created an index for this factor by averaging the assessments across the seven issues (M = 2.7, SD = .63).

Predicting Expectations

We performed a regression of stock market expectations on overall assessments of economic developments, controlling for age, gender, income, marital status, and education level (Table 3). This model shows that participants who made more positive overall assessments of economic developments also believed that the stock market was more likely to increase.[4]

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issues. These factors were correlated .52. Adding the number of issues considered in each factor to the regression analysis presented later results in an estimate for the average assessments index of B = 10.23, se = 2.63, p < .001. The estimate for number of thoughts in the first factor is B = -.17, se = 1.41, p = .90 and the estimate for number of thoughts in the second factor is B = 1.67, se = 2.02, p = .41.

[4] A regression using the average assessment of issues that respondents considered (omitting those that were not considered) results in the following estimate: B = 8.79, se = 1.99, p < .001.

Additionally, there was a positive relationship between income and stock market expectations (replicating Kézdi and Willis, 2011). In contrast to previous work (e.g., Dominitz and Manski, 2007), no other demographic variables were statistically significant.

[Insert Table 3 about here]

DISCUSSION

Over the past few decades, a shift from defined benefit retirement plans to defined contribution retirement plans has required more Americans to personally manage their retirement assets and wealth accumulation (Poterba, Rauh, Venti, and Wise, 2007). In order to secure enough wealth to retire, consumers are encouraged to invest in the stock market. Yet, only about 50% of U.S. households have stock market holdings, even when including indirect holdings such as stocks held in managed retirement accounts (Board of Governors of the Federal Reserve System, 2014). Given that people with more optimistic expectations are more likely to have stock market holdings (e.g., Dominitz and Manski, 2007) and that expectations predict future investment behavior (Hurd, Van Rooij, and Winter, 2011), previous research has suggested exploring how consumers form their stock market expectations in order to understand their investment behavior (Hurd, 2009). To date, however, models of expectations formation have relied on historical stock market returns (e.g., Dominitz and Manski, 2011) rather than directly exploring the thought processes that consumers have when forming expectations (e.g., Bruine de Bruin et al., 2010).

In the current research, we found that consumers varied in the number and type of issues they considered when forming stock market expectations. However, participants' assessments of how these issues would evolve over the next year were highly correlated, reflecting a general

assessment of economic developments. Moreover, we find that heterogeneity in stock market expectations is related to consumers' overall assessments of economic developments.

Given these findings, it would be worthwhile to know how consumers form their overall perceptions of the economy. A long history of research on consumer sentiment has argued for a myriad of factors, including changes in income, prices, debt, and capital gains, the novelty of such changes, political events, and news coverage (e.g., de Boef and Kellstedt, 2004; Mueller, 1963). At the same time, psychologists have argued that impressions may be based more on emotional responses rather than on deep cognitions (Zajonc, 1980), an argument which is supported by evidence that stock market decisions are affected by momentary emotional states that are unrelated to the economy (Hirshleifer and Shumway, 2003). Given the breadth of possible relationships with both economic and non-economic factors, future research may consider tapping into multiple constructs to better understand consumers' perceptions.

Our research has two major limitations. First, we sampled a limited number of consumers from an Internet panel. It would be helpful to explore stock market expectations with representative samples to check for robustness, as well as with financial experts to explore differences in thinking. Second, because our data are cross-sectional, we are prohibited from making causal claims. While it appears reasonable that participants' overall assessments of economic developments would be correlated with their stock market expectations, it is possible that participants were affected by other concerns, such as a desire to provide consistent answers across the survey. Future research may address this limitation through different survey designs.

Applications and Policy Implications

Our results have implications for how to obtain economic information from consumers and how to provide information to consumers. In terms of gathering information from consumers, researchers should be aware that consumers reporting stock market expectations may be influenced by broader economic conditions. The format of the Health and Retirement Study is likely to amplify this influence, as it introduces the stock market expectations question by saying "We are interested in how well you think the economy will do in the future."

Given the perceived link between the stock market and overall economic developments, questions eliciting stock market expectations may be less reliable in periods where the stock market diverges from other measures of economic performance. For instance, consumers who based their stock market expectations on economic conditions may have appeared surprisingly pessimistic about financial markets in the years following the most recent financial crisis, when a recovery in the stock market was not immediately echoed in employment statistics and other measures of economic growth. Researchers interested in isolating beliefs about financial markets may consider asking consumers for their expectations for both the stock market and the broader economy in order to make it clear that the content of one question should be separated from the other.

Additionally, our findings are relevant to policy makers and financial planners who want to encourage consumers to invest. Although financial experts may provide ample reasons for people to invest, their advice may be ignored if it does not correspond with lay perceptions of the decision. In other words, understanding lay perceptions is an important first step towards developing effective communications about stock market investments (Bruine de Bruin and Bostrom, 2013). Our findings suggest that effective appeals to promote stock market investments could be targeted at consumers' overall perceptions of the economy. Given that "the

unemployment rate" had the highest correlation with "the state of the economy" in our data, as well as the highest factor loading on participants' improvement ratings, we suspect that providing information about improved employment prospects would have been most persuasive to consumers at the time of our survey, when 40% of American adults reported hearing primarily negative news about jobs (Dimock, Doherty, and Motel, 2013). In the future, research should test whether such communications can be used to inform consumers' decisions and whether presenting different economic indicators shapes the effectiveness of these communications.

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TABLE 1

Frequency of Issues, Average Assessments, and Correlations between Assessments and Expectations

	Issue	Percent of Participants Reporting Issue[a]	Mean Assessment	*SD* Assessment	Correlation of Assessment With Stock Market Expectations
1.	The state of the economy	73.4	2.87	.84	.37***
2.	Prices	36.7	2.42	.77	.16*
3.	The unemployment rate	36.7	2.95	.88	.31***
4.	Interest rates on savings and investments	30.7	2.83	.75	.20**
5.	Economic policies	30.7	2.52	.79	.19**
6.	Political developments	30.3	2.54	.84	.18**
7.	Interest rates on loans and mortgages	29.8	2.67	.78	.08

[a] Percentages sum to more than 100% because participants could report thinking about more than one issue.

Note. Issues are presented in descending frequency. ***$p < .001$; **$p < .01$; *$p < .05$

TABLE 2

Correlations for Assessments of Each Issue

	Issue	1	2	3	4	5	6	7
1.	The state of the economy	--	.48	.81	.51	.58	.54	.46
2.	Prices		**--**	.48	.52	.58	.51	.52
3.	The unemployment rate			--	.58	.58	.53	.49
4.	Interest rates on savings and investments				--	.53	.46	.55
5.	Economic policies					**--**	.80	.42
6.	Political developments						--	.45
7.	Interest rates on loans and mortgages							--

Note. Numbers represent Pearson correlations in assessments of whether each topic would improve or decline over the next year. All correlations are significant at $p < .001$.

TABLE 3
Regression Results Predicting Stock Market Expectations

	B (se)
Overall assessment of economic developments[a]	9.95*** (2.63)
Demographics	
Female	-3.56 (3.26)
Age	.13 (.14)
Married	1.46 (3.61)
Log(inferred income)[b]	3.67* (1.80)
College graduate	2.91 (3.75)
Intercept	-24.96 (19.49)
R^2	.13
Adj R^2	.11

[a] Assessment of economic developments was a rating from 1 to 5 representing the average assessment across all issues.
[b] ALP participants report income in ranges such as "$40,000 to $49,999." We took the midpoint of each range to create an inferred income measure.
Note: $N = 218$. ***$p < .001$; **$p < .01$; *$p < .05$; +$p < .10$

FIGURE 1
Distribution of Stock Market Expectations