

DEMOGRAPHIC FACTORS AFFECTING MACROECONOMIC EXPECTATIONS

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ABSTRACT

This paper uses cross-sectional data from five instances of the Survey of Consumer Finances spanning 13 years to look at demographic factors that affect household expectations for economic growth and interest rates. It finds that expectations of growth show significant heterogeneity across individuals but the distribution is relatively stable over time. Expectations reflect the current state of the economy and also behavioral factors unrelated to the macroeconomy that likely represent mood and optimism, for example the health status of the individual and race. Expectations of interest rates also show significant heterogeneity but are not affected by optimism factors. JEL: D84.

INTRODUCTION

There is a long tradition in macroeconomics that emphasizes the importance of investor and consumer confidence as a source of economic fluctuations, perhaps most noticeably associated with Keynes (1936) and the term “animal spirits”. However, there has also been a recent resurgence in interest in this idea in the aftermath of the 2007 financial crisis. Bachmann, Ruediger and Sims (2010) document the concerns of both important policy makers and economists on how consumer confidence was affecting the strength of the recovery after the recession. While there has been theoretical work on how confidence can drive fluctuations in a world with multiple equilibria (e.g. Farmer, 1998) and empirical work connecting consumer confidence to business cycles (e.g. Bachmann, Ruediger and Sims 2010) or changes in consumer spending (Carroll and Dunn, 1997, Carroll, Fuhrer and Wilcox, 1994) there has been relatively little work on the determinants of consumer confidence itself, particularly on sociological and demographic factors that might affect expectations. Much of that work there is on expectations formation focuses specifically on expectations of inflation due to its importance in theories of monetary policy.

The Survey of Consumer Finances (SCF) provides an interesting source of data on expectations and confidence about the real economy. In each round of the survey, it asks respondents several questions about expectations for the macroeconomy while at the same time collecting detailed information about the respondent’s economic, demographic and sociologic characteristics.

This paper adds to the empirical literature about expectation formation by using SCF data set to show how demographic factors affect expectations of the aggregate economy. Specifically, the paper uses the last five waves of the SCF to examine factors affecting household-level expectations of future output and interest rates. This is a particularly interesting time as it covers a period before and after a major recession. The paper has several primary findings. First, expectations of economic growth show substantial heterogeneity with a significant number of individuals expecting an increase in GDP and a significant number expecting a decrease at any given time. Heterogeneity remains a challenge for economics to explain as it does not seem that individual-specific local knowledge accounts for all expectational differences. Second, expectations can be driven by behavior factors that likely represent mood and optimism, for example the health status of the individual and race. In addition, expectations also seem to reflect the current state of the economy. Expectations of interest rates also show significant heterogeneity but are not affected by the optimism factors, likely because it is not clear whether higher or lower interest rates are a “better” outcome.

Section 2 provides an overview of the literature on the heterogeneity of expectations. Section 3 looks at the broad distribution of expectations across five survey years spanning 13 calendar years and finds that there is a significant split in expectations. However, this split is relatively stable, showing up in each of the survey years. Section 4 investigates the heterogeneity of expectations of output growth in detail using regressions in each survey year to see which variables are consistently important across years. Section 5 repeats the exercise for expectations of interest rates. Section 6 concludes.

LITERATURE

Because of the importance of inflationary expectations in macroeconomic models, either in terms of adaptive expectations (e.g., Friedman, 1968) or rational expectations (e.g., Lucas 1972), much of the work on expectations formation has been in the context of inflation, particularly on whether expectations on average are unbiased or slow to adjust to new information. Reviews of the evidence (Carlson, 1977, deLeeuw and McKelvey, 1984, Lovell, 1986, and Curtin, 2010) generally find inflation expectations to be biased and adaptive, which is not surprising given the various biases that have been established about the way individuals form beliefs (Tversky and Kahneman, 1974). Keane and Runkle (1989, 1990) are the notable exception to this, perhaps because their data is from professional forecasters who have an incentive to make better forecasts and have greater experience in forecasting (Croushore, 1993).

In addition to biases, the studies have found significant amounts of heterogeneity in expectations. Cukierman and Wachtel (1979) find that heterogeneity in expectations of inflation are related to the variance of changes in nominal income. They attribute the difference to the higher variance of nominal income leading to individuals having different local information. Similarly, Branch (2007), Mankiw et al. (2003) and Carrol (2003) develop models where individuals update information at different times. At any point in time individuals will be working with different information sets and this leads to heterogeneity. Pfajfar and Sontoro (2010) also find heterogeneity in expectations of inflation and attribute it to different forecasting processes reflecting rationality, adaptive learning and autoregression by the participants.

Other papers attribute expectations heterogeneity to differences in individual characteristics. Malmendier and Nagel (2013) find that heterogeneity is partly driven by individuals learning by experience and different age cohorts having different experiences with inflation, which suggests age should be included as a potential factor in models of expectations. Madeira and Zafar (2014) also find that lifetime inflation experience affects inflation expectations and that demographic characteristics such as sex, race and education affect the weight placed on prior expectations and how quickly beliefs are updated. Bryan and Venkatu (2001a; 2001b) use Federal Reserve survey data on inflation expectations for households in Ohio and find that a variety of individual characteristics influence expectations, specifically higher-income, married, white, middle age (vs. young) and male respondents expect less inflation. They rule out different shopping experiences and suggest in a later paper (Bryan and Venkatu, 2011) that certain demographic groups may be more likely to produce outliers in expectations since the differences are much less for medians than means. Leung (2009), using data from New Zealand, finds younger, female and non-European individuals have higher expectations. Bruine de Bruin et al. (2010) find that inflation expectations are higher for non-white, single, less educated, poorer and older individuals.

There is some work looking at heterogeneity of expectations of real variables. Souleles (2004) examines forecast errors for expectations for economic growth by comparing individuals forecasts for the economy going forward with their perceptions of how the economy grew over the last year when asked one year later. Looking over a number of years, there are some demographic predictors of bias including region and age but the effects were smaller than for other variables in the survey. Tortorice (2010) finds heterogeneity in expectations of unemployment in the Michigan Survey of Consumers and that people seem to overweight current events by partially forming expectations by extrapolating current trends. Higher income or better educated households were slightly less likely to make this error.

Looking across the literature there is suggestive evidence that demographic factors affect the heterogeneity of expectations. One of the values of the SCF is that it provides richer detail of household characteristics along with expectations. This paper will take advantage of that by looking at the household-specific factors that affect expectations.

CHANGES IN EXPECTATIONS OVER TIME

The SCF is a triennial survey of families in the United States sponsored by the Federal Reserve Board with data collected by the National Opinion Research Center. Its primary focus is on wealth, income and financial attitudes and activities but also includes a great amount of information on household characteristics.

Because one of the main purposes of the survey is to measure the distribution of financial assets in the United States, the survey oversamples high-wealth households since a large fraction of the population hold little in financial assets. The survey also oversamples Blacks and Hispanics as another objective of the survey is determine the distribution of assets by race or ethnicity. Distributions reported in section 4 are weighted using the sample weights provided in the SCF so that they reflect the proportions in the United States rather than the proportions in the sample. To handle missing responses, the survey uses a multiple imputation procedure resulting in five imputates

for each observation. Standard errors and p-values reported in this paper have been corrected for this using the MI package in STATA, following Montalto and Sung (1996).

For the survey years examined (2001, 2004, 2007, 2010, 2013) they ask two questions about macroeconomic expectations:

I'd like to start this interview by asking you about your expectations for the future. Over the next five years, do you expect the U.S. economy as a whole to perform better, worse, or about the same as it has over the past five years?

1. Better
2. Worse
3. About the same

Five years from now, do you think interest rates will be higher, lower, or about the same as today?

1. Higher
2. Lower
3. About the same

For purposes of the regressions in this paper, the answers were reordered so that “3” is Better/Higher, “2” is About the same and “1” is Worse/Lower.

Table 1 shows the distributions of expectations for economic growth for the last five survey years. There are several important items to note. First, there is significant heterogeneity of expectations in each of the survey years. Second, the distribution is surprisingly stable with a significant fraction expecting the economy to get better and also a significant fraction expecting it to get worse in each of the five survey years. However, the distribution is not constant and at least partially reflected the economic circumstances of the time, with the most pessimistic expectations coming during a mild recession (2001) and at the onset of a severe recession (2007) which is consistent with Fuster et al. (2010) which presents evidence that recent economic changes have a disproportionate influence on beliefs.

Table 2 shows the distribution of expectations for interest rates. Again there is substantial heterogeneity although more agreement overall than with expectations for the real economy. The numbers also suggest that people have autoregressive expectations towards interest rates, with the recent decline in interest rates driving expectations for increasing interest rates in the future.

FACTORS AFFECTING EXPECTATIONS ABOUT THE ECONOMY

The literature discussed in section 2 suggests a number of different variables that might account for heterogeneity in expectations. Since expectations for the future of the economy seem to be dependent on the current state of the economy, perhaps because individuals use naïve forecasting rules based on local experience, several different income variables will be used. Overall income is the general income variable; however, because recent income history may differ based on the source of income, separate measures will be added for interest income, income from stocks and business income. The survey also asks whether household income has gone up more than inflation over the last 5 years (with the options being “up more”, “about the same” and “up less”). Having a positive income history may lead to optimism about the future. Since negative personal income events may also matter, three measures of alternate employment status, unemployed, retired and disabled, will be added. A measure of financial wealth was constructed following definition used by the codebook associated with the reporting of the data in the Federal Reserve Bulletin (Board of Governors of the Federal Reserve System, 2015).

Another reason that expectations might differ is cognitive differences in processing information about the economy (for example, Burke and Manz, 2010, on the importance of economic literacy). Years of education will be added as a measure of this.

There are a number of demographic variables that rationally shouldn't matter for expectations for the macroeconomy; however, these variable have been found in other studies to be significant for economic decisions. Age and race (Black and Hispanic) will be added, although it is unclear *a priori* what sign they should have. There is some evidence that sex affects attitudes towards economic matters and so dummy variables for the sex of

respondent and whether or not they are married will be included. A wide variety of demographic variables have been found to be significant for financial decision making including the health of the individual (Berkowitz and Qiu, 2002, Rosen and Wu, 2004, Dow, 2009). While health status obviously would not affect the macroeconomy, it might affect the mental state of the individual and therefore their optimism about the future. The self-reported health of the respondent is measured by the response of the individual to the following question:

Would you say your health in general is excellent, good, fair, or poor?

1. *Excellent
2. *Good
3. *Fair
4. *Poor
0. Inap. (no spouse/partner)

Regression were run separately for each survey year, rather than with pooled data, to allow for breaks in behavior over time without choosing *a priori* where those breaks should be and also to assess the robustness of relationships across time. The dependent data is the survey response to expectations for the economy for the next five years (3=better, 2=about the same, 1=worse).

Table 3 reports the results from an ordered probit regression. There are several key outcomes. The most consistent variable over time is health status. A higher value indicates poorer health so a negative coefficient implies that individuals with poor health are more pessimistic about the economy. Health logically should not be related to the performance of the aggregate economy nor does it reflect specific local information that is relevant for forecasting the economy so it likely reflects something that affects the psychological state of the individual. Individuals in bad health may well be more pessimistic about things in general. For the most part, Blacks and Hispanics were more optimistic about the prospects for the economy. What is particularly interesting is the shift in Black expectations. Prior to 2007, Blacks' expectations were no different or pessimistic compared to expectations of others. This shifted significantly from 2007 on. One possibility is that this increase in optimism reflects the candidacy and election of Barack Obama as President of the United States. Obama announced his candidacy in early 2007, elected in 2008, and was President in the last two surveys.

Wealth and income variables show a mixed relationship. In four of the five regressions, the effect of wealth is positive and significant, although in four of the five regressions the income coefficient is negative and significant. Employment status (i.e. unemployed, retired or disabled) does not seem to have a consistently significant effect. Business income does not matter and income from stock has an inconsistent effect.

The response to whether income exceeded inflation in the past is a positive predictor of expectations for the future. This is consistent with a behavior explanation for expectations as it is likely that if things went well for the individual in the past, or at least the person felt that way, that positivity would be extrapolated into the future (even though the expectations question refers to the economy as a whole rather than the individual's personal prospects).

FACTORS AFFECTING EXPECTATIONS OF INTEREST RATES

Expectations for interest rates provide an interesting contrast to expectations for the overall economy. In both cases there was a considerable amount of heterogeneity and yet it seems that there is little consistency in the factors that bias expectations. Table 4 repeats the regressions of the previous section, this time with the dependent variable being expectations for the interest rates over the next five years (again, an ordered probit with "lower"=1, "about the same"=2 and "higher"= 3). While there are a number of statistically significant coefficients, only two variable were significant in at least four of the five surveys and two variables were significant in three. Even here there is weak support for a consistent behavioral relationship since sometimes the coefficients take opposite signs in different years. There is a positive bias with income (although opposite in 2007) and a negative bias with sex (although the opposite in 2007). While having more interest income might make the household more aware of trends in interest rates, it did not seem to affect expectations of interest rates.

In part, this likely represents differences in how individuals treat changes in output and interest rates. With output, the desirability of an increase is clear. An improving economy is good and reflects an optimistic stance while a declining economy is bad and pessimistic. With interest rates there is not a clear relationship. At a personal level, higher interest rates would be good for savers while lower interest rates are good for borrowers. While

interest rates might also reflect the state of the economy, here the connection is again ambiguous and likely not clear to the average individual.

While there is a great amount of heterogeneity in expectations of interest rates, it does not seem to be systematic and probably reflects that households do not have extensive information about movements in interest rates. An option of “no opinion” might have been advantageous in pulling out low-information households.

CONCLUSION

Expectations play a central role for economic decisions in such areas as consumption, investment and monetary policy. While much of the research in expectation formation has taken place in the context of inflation expectations due to its importance in monetary policy, expectations of other macroeconomic variables seem increasingly important for economic decision making.

There is increasing evidence that individual expectations are influenced by other factors than simple rationality would predict. The results of this paper supports that literature, in particular, poor health makes individuals pessimistic about the state of the economy. If this is the case, it seems plausible that other factors not directly tied to economic performance could also make them optimistic and so efforts to produce increased consumer confidence may be a desirable goal.

However, the distribution of expectations also suggests that expectations may not be easily malleable. Over the period examined, we do not see large swings in expectations, even though the period examined spanned a time of economic growth, crisis and then rebound. Expectations could reflect individual temperament, which while may be irrational, may also be difficult to change.

Interestingly, wealth and income mattered little for expectations. While rich and poor are likely to have different economic experiences and different exposures to investment and labor income risks, it does not seem to be the case that one group is more optimistic or pessimistic than the other.

The value of surveys such as the SCF is that they provides a close look at individual behavior and expectations. A limitation of these kinds of surveys is that the amount of data collected implies that they cannot be performed multiple times within a year. Since macroeconomic policymakers typically rely on higher-frequency data, they would be of limited use for the monthly decisions made by organizations such as the Open Market Committee of the Federal Reserve. However, the broader surveys do provide information about how to interpret the expectations data that are collected at a higher frequency, in particular, why there is a wide dispersion in expectations across individuals and how this dispersion is tied to individual characteristics which may be slow to change. In addition, the SCF provides detailed data beyond what was covered in this paper. A more detailed investigation of individual characteristics, including home ownership, types of assets owned, credit history and other financial variables, and how their home purchase, spending and asset allocation decisions are tied to expectations formation, remain topics for future research.

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TABLE 1. EXPECTATIONS FOR THE ECONOMY FOR THE NEXT FIVE YEARS

%	2001	2004	2007	2010	2013
Getting better	27.9	44.1	31.0	52.6	45.2
Stay the same	40.9	37.7	38.1	29.0	38.8
Getting worse	31.1	18.2	30.9	18.4	21.0
GDP	0.2	3.1	1.9	2.7	3.1

GDP is real GDP growth, Q4 to Q4. Source: US. Bureau of Economic Analysis (2014).

TABLE 2. EXPECTATIONS FOR INTEREST RATES FOR THE NEXT FIVE YEARS

%	2001	2004	2007	2010	2013
Higher	42.4	79.9	66.2	73.6	76.8
Same	45.1	16.7	26.1	19.9	18.1
Lower	12.5	3.4	7.6	6.4	5.1
CD Rate	3.66	1.74	5.23	0.44	0.12

For survey years between 2001 and 2010, CD Rate is from the series “6 Month CD”. For the 2013 survey, it is from the series “National Rate on Non-Jumbo 6 Month CD”. Source: Federal Deposit Insurance Corporation (2014) and Board of Governors of the Federal Reserve System (2014).

TABLE 3. FACTORS DETERMINING EXPECTATIONS FOR THE ECONOMY

	2001	2004	2007	2010	2013
Age	0.002 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.003*** (0.001)	-0.002 (0.001)
Sex	0.008 (0.036)	-0.137*** (0.037)	-0.082** (0.037)	0.002 (0.031)	-0.057* (0.032)
Married	0.040 (0.040)	0.035 (0.042)	0.008 (0.041)	0.010 (0.034)	-0.036 (0.036)
Health	-0.094*** (0.024)	-0.077*** (0.024)	-0.049** (0.024)	-0.072*** (0.020)	-0.069*** (0.020)
Black	0.044 (0.059)	-0.108* (0.059)	0.266*** (0.063)	0.569*** (0.050)	0.441*** (0.049)
Hispanic	0.356*** (0.075)	-0.011 (0.070)	0.193*** (0.071)	0.334*** (0.054)	0.296*** (0.056)
Education	-0.001 (0.008)	0.014* (0.008)	-0.000 (0.007)	0.029*** (0.007)	0.042*** (0.007)
Wealth	0.049 (0.047)	0.157*** (0.049)	0.133*** (0.047)	0.122*** (0.044)	0.135*** (0.041)
Income	-0.045** (0.018)	-0.029* (0.018)	-0.063*** (0.017)	-0.047*** (0.017)	-0.005 (0.017)
Unemployed	0.036 (0.095)	0.024 (0.091)	-0.160* (0.097)	0.152** (0.063)	0.040 (0.068)
Retired	0.095 (0.060)	-0.065 (0.062)	-0.115* (0.059)	-0.041 (0.053)	-0.078 (0.051)
Disabled	-0.029 (0.102)	-0.090 (0.094)	-0.078 (0.093)	-0.229*** (0.069)	0.048 (0.074)
Interest Income	-0.061 (0.054)	-0.043 (0.061)	-0.072 (0.056)	-0.069 (0.056)	-0.077 (0.060)
Business Income	-0.059 (0.053)	0.027 (0.057)	-0.003 (0.055)	0.026 (0.052)	0.019 (0.054)
Stock Income	-0.155*** (0.058)	0.051 (0.059)	-.014 (0.055)	0.111** (0.055)	0.132** (0.056)
Income > Inflation	0.020 (0.026)	0.133*** (0.025)	0.103*** (0.025)	0.110*** (0.022)	0.131*** (0.022)
n	4,422	4,495	4,385	6,394	5,971

Standard errors in parentheses. Significance indicated at *10% level, **5% level and ***1% level.

TABLE 4. FACTORS DETERMINING EXPECTATIONS FOR INTEREST RATES

	2001	2004	2007	2010	2013
Age	-0.007*** (0.002)	0.003 (0.002)	-0.006*** (0.002)	0.002 (0.001)	0.003* (0.002)
Sex	0.022 (0.039)	-0.122*** (0.047)	0.117*** (0.040)	-0.143*** (0.035)	-0.091** (0.038)
Married	0.103** (0.044)	0.128** (0.052)	0.003 (0.042)	0.002 (0.039)	0.056 (0.043)
Health	0.049* (0.026)	0.042 (0.030)	0.082*** (0.026)	0.023 (0.023)	-0.013 (0.025)
Black	0.190*** (0.067)	-0.064 (0.071)	0.090 (0.071)	-0.115** (0.051)	0.031 (0.056)
Hispanic	-0.051 (0.081)	-0.193** (0.081)	-0.245*** (0.077)	-0.135*** (0.057)	-0.037 (0.064)
Education	0.001 (0.008)	0.041*** (0.009)	-0.001 (0.009)	0.006 (0.008)	0.007 (0.008)
Wealth	0.011 (0.052)	0.106* (0.061)	-0.020 (0.053)	0.096** (0.045)	0.122** (0.049)
Income	0.038* (0.020)	0.038 (0.025)	-0.033* (0.019)	0.087*** (0.022)	0.136*** (0.023)
Unemployed	0.148 (0.108)	0.023 (0.111)	0.309*** (0.119)	0.077 (0.069)	0.132 (0.081)
Retired	0.027 (0.066)	-0.164** (0.080)	-0.027 (0.064)	-0.109* (0.063)	-0.005 (0.065)
Disabled	0.222* (0.117)	-0.113 (0.113)	-0.006 (0.104)	0.023 (0.077)	0.142 (0.088)
Interest Income	0.087 (0.062)	0.173** (0.086)	0.009 (0.061)	0.165** (0.071)	0.043 (0.083)
Business Income	0.044 (0.059)	-0.050 (0.078)	0.021 (0.060)	0.010 (0.064)	0.020 (0.072)
Stock Income	-0.057 (0.058)	0.019 (0.084)	0.078 (0.060)	0.313*** (0.074)	0.122 (0.075)
Income > Inflation	0.003 (0.028)	-0.000 (0.032)	-0.009 (0.028)	-0.022 (0.026)	-0.017 (0.028)
n	4,422	4,495	4,385	6,394	5,971

Standard errors in parentheses. Significance indicated at *10% level, **5% level and ***1% level.