Economic Policy Uncertainty and Stock Market Participation[#]

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Abstract

Does economic policy uncertainty affect household stockholding? To answer this question we create a novel measure of household exposure to economic policy uncertainty news by combining survey information on the hours a household spends in reading newspapers and the frequency of such news in the popular press during a household's pre-interview period that we count using the Baker et al. index (*QJE*, 2016). After controlling for household fixed effects, month-year fixed effects and time-varying heterogeneity in cognitive skills, we find that households with a higher exposure to economic policy uncertainty news are less likely to invest in stocks. We also show that the effect of experienced uncertainty is independent from household (first-moment) expectations about the stock market index level.

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1. Introduction

Economic policy uncertainty has important repercussions for various facets of economic activity and has been recently recognized as a key contributing factor to the post-crisis sluggish recovery. Existing empirical studies have mostly examined time-varying macroeconomic uncertainty and its relevance over other aggregate factors (e.g., Jurado et al. 2015). On the other hand, there is quite limited evidence mainly on households' financial decisions, but also on firms' investment, due to the difficulty in measuring the heterogeneous exposure of the economic units to prevailing uncertainty. Nonetheless, it is important to understand how political uncertainty influences economic units and quantify its impact on their choices.

In this paper, we propose a novel measure of exposure to economic policy uncertainty that is household-specific. In particular, we combine information on the hours households spend in reading newspapers and the frequency of articles denoting political uncertainty in the popular press, measured according to a widely used news-based index. Next, we use our measure to investigate whether economic policy uncertainty affects household stock market participation as well as ownership of other assets such as government and corporate bonds. Thus, we shed light on the link between risk and uncertainty that households consider when making investment decisions.

The news-based measure of economic policy uncertainty (EPU) that we utilize draws from the seminal work of Baker et al. (2016, BBD henceforth). The measure is constructed as the word count of articles denoting uncertainty about monetary, fiscal and regulatory policies in the popular press and it is calculated over the period prior to every household interview. BBD use information on firms' revenues dependence on government spending to measure firm exposure to EPU and

examine its consequences for firms' investment, hiring and stock market volatility.[1] In addition, Gulen and Ion (2016) consider firms which face higher irreversible investment costs to be more affected by EPU, as they have a stronger incentive to wait until background uncertainty diminishes. Instead of focusing on firms, we examine the extent to which households' financial decisions are affected by political uncertainty. We consider the time households spend in reading news as a direct channel through which household are likely to get exposed to press articles denoting political uncertainty.

To create a measure of household exposure to political uncertainty we use longitudinal data from the US Health and Retirement Study and its supplement, the Consumption and Activities Mail Survey that interview a nationally representative sample of households fifty years and older. These households possess the largest share of assets in the United States and their investment decisions are likely to have broader aggregate implications.[2] As we discuss in the data section, the surveys we use provide an ideal set-up for addressing the research question at hand. That is, they offer all necessary information on household financial assets and various demographics including cognitive tests. Importantly, they also provide information on respondents' time use, and in particular, on time spent in reading the news (from paper and online). Moreover, the survey designs allow us to exploit random variation in prevailing uncertainty over the months preceding each household interview.

Our paper makes a number of empirical contributions. First, we propose a household-specific measure of direct exposure to the news-based EPU that can be used to examine the role of

[1] In an early contribution, Guiso and Parigi (1999) use as a proxy for uncertainty subjective information from a survey of firm owners and CEO's regarding the future demand of their own firm's product. Instead, Bloom et al. (2007) proxy for firm uncertainty by share price volatility.

[2] According to the 2007-2010 US Surveys of Consumer Finances, this older group of households owns 78% of gross equities and 75% of net wealth held by the total population.

economic policy uncertainty for various household decisions. Second, we examine whether news-based EPU affects household stock holdings, owned directly or through mutual funds. We estimate that a one standard deviation increase in the EPU index implies a 6% net decrease on the unconditional probability of owning these assets. As we discuss below, theory draws a distinction between choices regarding future outcomes with a known probability distribution (risk) and future outcomes linked to unknown probabilities (uncertainty). Our finding provides empirical support for ambiguity aversion, namely the fact that agents demand an ambiguity premium (over and above the classic risk premium) to hold assets with uncertain returns (see Epstein and Schneider 2010; Gollier 2011; and the empirical findings in Dimmock et al. 2016).

In addition, we examine participation in other financial asset categories. We find that fluctuations in EPU do not have an impact on ownership of stocks held through individual retirement accounts (IRAs), consistent with existing evidence on considerable household inertia in reshuffling retirement portfolios. As regards bonds, we estimate a strong negative impact of EPU on ownership of corporate bonds, while we find no effect on government bonds.

Third, our data record household stock market expectations, thus allowing us to estimate the effect of uncertainty (second-moment effect) net of the effect of expectations about the level of the stock market index (first-moment effect). Disentangling the two in a direct way has not been possible in earlier applications using firm level data.[3]

Fourth, given that we use micro-level data one can examine whether certain population subgroups respond differently to EPU news. In particular, when we consider groups with different education we find that the negative effect of exposure to EPU on stock market participation mainly comes from the less educated households. This provides suggestive evidence for the so-called

[3] For example, BBD control for future expectations by using a measure of forecasted federal purchases.

'competence hypothesis', according to which agents tend to be more ambiguity averse towards tasks for which they feel less competent.

We take a number of steps in order to ensure that our estimation strategy uncovers genuine effects. These steps are discussed in detail in the relevant section, yet one can summarize them briefly as follows. First, we identify the effect of interest through the interaction term of time every household spends in reading the news and the EPU news-based index during that household's pre-interview period. The index varies randomly across households surveyed in a baseline interview year, depending on the month in which they are interviewed. Information on time reading newspapers is collected in every wave shortly prior to the period over which the EPU index is calculated (i.e. it is pre-determined relative to follow-up fluctuations in EPU). Thus, both components of the interaction term exhibit cross-sectional and temporal variation. This allows us to estimate a double fixed effects model that takes into account both household fixed effects (accounting for any household-specific, time invariant household unobserved traits) and month of interview-year fixed effects (accounting for any time-varying factors by month, including the EPU index in levels). Further to this, we take into account a number of household-specific time-varying characteristics, such as cognitive skills measured in every interview.

Second, one concern could be that our inference is contaminated by possible interactions of the hours reading news with other (than the EPU index) time-varying aggregate indicators that remained unaccounted for. To address this concern, we interact hours reading news with various time-varying aggregate indicators (SP500, VIX, CPI, GDP growth, Oil prices, etc.) and show that when these are added to our specification leave the estimate of interest unaffected. In addition, we estimate placebo regressions in which we use the EPU index computed over news published in Swedish, instead of US major newspapers.

Third, following our checks on the one component of the interaction term (i.e. the EPU news-based index) we also examine whether hours reading news (i.e. the other component of the interaction term) correlate with household unobserved characteristics that are time-varying. A first check, regards the estimation of a very rich specification that takes into account all time-varying controls that existing household finance literature has shown to be relevant for household stock investing (e.g., cognition, health, risk aversion, optimism, sociability, engagement in voluntary activities, internet use, etc.). Furthermore, we interact the EPU index with hours spent in a number of other (than reading news) activities, such as working, socializing with friends, entertaining, and watching movies on TV, but none of these interaction terms displays any significant association with stock ownership. We also consider hours reading books, which represents an activity that is conceptually similar to newspaper reading and the two should be equally affected by household (time-varying) unobservables. Reassuringly, we estimate an insignificant effect of the interaction of hours reading books with the EPU index, which reflects the limited – through book reading - exposure to news-based uncertainty. Moreover, we use an IV estimation in which we instrument the news uncertainty index in the popular press with a measure of uncertainty deduced from the Federal Reserve's Beige Book (i.e. a source of information that households are assumed not having direct exposure to). While the two measures are correlated, it is unlikely that uncertainty recorded in Beige Book impacts stock holding through household unobservables.

Fourth, one may argue that households that decide to invest in stocks also decide to spend more hours in reading the news in the popular press. We tackle this issue by taking into account how close respondents report to follow stock market developments in every wave. Moreover, we re-estimate our baseline specification by taking the lagged value of hours reading newspapers from the previous wave and interact this with contemporaneous values of the EPU index and our

findings are not affected. Instead, when we interact hours reading newspapers with lagged values of the EPU index taken from the pre-interview period of the previous wave (i.e. a period that should not be relevant for current asset choices), our main estimate turns, as one would expect, insignificant.

The remainder of the paper is organized as follows. Section 2 reviews the related literature. Section 3 describes the data used. Section 4 provides details on the empirical analysis, while Section 5 discusses the empirical findings. Section 6 shows results from a number of robustness checks and Section 7 provides some additional results on the relationship between EPU and ownership of stock IRAs and corporate and government bonds. Finally, Section 8 concludes.

2. Related literature

The concept of uncertainty can be traced back to the insights of Knight (1921), who draws a theoretical distinction between situations with a known probability distribution over a set of events and situations where these probabilities are unknown. The first problem is termed as risk, while the second one is characterized as uncertainty (often also referred as Knightian uncertainty).

A number of studies document that uncertainty varies over time and postulate that this variation represents either an exogenous source of variation or a response to fluctuations of the business cycle (Bloom 2009; Bloom 2014; Jurado et al. 2015; Ludvigson et al. 2015). Recent studies provide evidence on the depressing short-run aggregate economic consequences of an increase in uncertainty suggesting various possible mechanisms at work. In some of these models, uncertainty depresses real activity through the real options effect. By raising the option value of waiting, it affects either firms' incentives leading them to delay their investment and hiring (Bloom 2009; Bernanke 1983) or triggers a cautious response from households who raise their

precautionary saving that ultimately dampens household consumption (Romer 1990; Fernández-Villaverde et al. 2011; Bloom 2014). Gilchrist et al. (2014) examine how uncertainty can operate through financial markets and find that rising uncertainty can channel in through higher cost of capital and lead to lower investment.[4]

Julio and Yook (2012) and Giavazzi and McMahon (2012) focus on rising political uncertainty around general elections and document that high political uncertainty causes lower investment and consumption around these events. Pastor and Veronesi (2012) measure movements in stock prices after a policy change is announced, while BBD suggest that the slow recovery from the Great Recession is associated with higher policy uncertainty during the period 2007 to 2009.

Despite a large number of theoretical papers that incorporate uncertainty, there is limited micro evidence on the relationship between fluctuations in uncertainty and individual firm and household decisions. Using the run-up to the 1998 German general elections Giavazzi and McMahon (2012) apply a difference in difference approach to identify the impact of political uncertainty on household saving behavior. Di Maggio et al. (2016) develop a county level uncertainty index based on excess returns of publicly listed firms and use this to study households' consumption and borrowing decisions. They find that uncertainty can have a large impact on consumption and borrowing decisions and the effect varies with borrowers' credit-risk. Leahy and Whited (1996), Guiso and Parigi (1999) and Bloom et al. (2007) examine firm level data and document a large negative relationship between uncertainty and investment. In these papers

[4] Although a large body of literature examines the negative repercussions of uncertainty, there are also studies pointing into the fact that uncertainty may have a positive effect on long-run growth. In these models, uncertainty stimulates research and development when firms faced with heightened uncertainty are more eager to innovate (Bar-Ilan and Strange 1996; Kraft et al. 2013).

uncertainty is either proxied with firm level stock-price volatility or measured based on a self-reported distribution of expectations about future demand.

Our paper uses instead a measure of political uncertainty that draws on the frequency counts of economic policy uncertainty news in the popular press. The measure has been recently utilized to explore the relationship between firm-level investment and uncertainty related to policy and regulatory conditions (see BBD and Gulen and Ion 2016). Firms that are more dependent on government spending or that face some irreversible investment costs are assumed to be exposed more to policy uncertainty. Both papers document a negative relationship between aggregate level of uncertainty and average firm investment. Instead, we look into households and use a measure (i.e. time reading newspapers) that denotes direct exposure to news in the press.[5]

Our study also contributes to the growing household finance literature that has examined how various socio-economic factors influence stock market participation, but has not assessed the role of economic policy uncertainty (see Guiso and Sodini 2013 for a recent thorough review). When faced with decisions that involve risk and uncertainty agents are ambiguity averse, that is they prefer choices with known over unknown probabilities of future outcomes (Ellsberg 1961). As agents dislike uncertainty, they require an ambiguity premium to hold assets with uncertain returns (over and above the classic risk premium), which increases with aversion toward uncertainty (see Maccheroni et al. 2013; Gollier 2011, and Izhakian and Benninga 2011). In the presence of uncertainty, stock market participation should be lower than predicted by standard portfolio models, and there should be a negative relationship between uncertainty and participation in the stock market (Epstein and Schneider 2010; Easley and O'Hara 2009). Dimmock et al. (2016)

[5] Aguiar et al. (2016) is one of the few studies that examine empirically the household time allocation into various activities. They find that leisure and home-production absorbs most of the foregone market work hours during the Great Recession.

introduce in a US household survey questions based on Ellsberg urns to measure individuals' ambiguity aversion. They find that more ambiguity averse individuals are less likely to invest in stocks and that they hold under-diversified portfolios.

3. Data

We use data from the Health and Retirement Study (HRS), a nationally representative, longitudinal survey offering detailed information on various household demographic characteristics as well as on their incomes and wealth (Hauser and Willis 2004 provide a detailed overview of the survey). The survey was launched in 1992 and interviews every other year about 20,000 Americans aged 50 and over. Interviews are contacted in different months in the course of a year and, as we explain below, the random assignment of households into interview months helps to identify the effect of interest. Since 2001, the HRS has administered the Consumption and Activities Mail Survey (CAMS), a supplemental survey sent by mail to a random sub-sample of HRS respondents in the fall of the year following the main interview. CAMS asks a series of questions about the amount of time individuals spend in various activities and household patterns of consumption.

Respondents participating in CAMS are explicitly asked to report the "hours spent last week in reading newspapers or magazines" (i.e. including reading from papers and online). They are also asked to report separately the hours spent last week in: "reading books"; "watching programs or movies/ videos on TV"; "using the computer"; as well as the hours devoted in other activities such as working, socializing with friends, engaging in voluntary activities, entertaining and sleeping. As we discuss below, we use the hours spent in reading newspapers or magazines as a

direct measure of 'exposure' to the news-based index on EPU, nevertheless, we also check whether the latter influences household stock holding through time spent in other activities.

The HRS (supplemented with CAMS) is the dataset that best serves our purposes because it collects high quality data on asset investment, time spent in reading newspapers and, as we explain in the next section, the design of the survey allows us to credibly identify the effect of interest. Moreover, one should note that households aged more than fifty years old in the US hold a significant fraction of total population resources. Therefore, it is instructive to investigate the extent to which policy uncertainty influences their investment choices.[6] We make use of all available waves of the HRS matched with CAMS, that is all seven waves from 2002 (matched with 2001 CAMS) to 2014 (matched with 2013 CAMS). [7]

We supplement the HRS data with information on the economic policy uncertainty that every household experiences in the period preceding the main interview. As mentioned, we measure economic policy uncertainty using the newspaper-based index by BBD.[8] The index (EPU) is calculated on a monthly basis utilizing information only from news publications. This news index conforms naturally to the hours spend in reading newspapers, which represent a direct channel through which households are exposed to political uncertainty.

[6] Data from the HRS have been extensively used in empirical household finance literature. For example, Hong et al. (2004), Rosen and Wu (2004), and Bogan (2008) examine, respectively, the effects of sociability, reported health, and internet use on stockholding decisions. Christelis et al. (2013) use data from the HRS combined with comparable data from Europe to examine differences in household portfolios across the Atlantic.

[7] For our analysis, we mostly rely on the HRS files created by the RAND Center for the Study of Aging.

[8] We use the monthly EPU downloaded from http://www.policyuncertainty.com/ (version February 28, 2017). This index is also used in the baseline analysis of BBD (2016). In addition, it is used together with two other indicators to construct a broader, overall policy-related economic uncertainty measure. The latter is calculated as a weighted average of the news-based index, tax code expiration data, and economic forecasters' disagreement about policy relevant variables: the CPI and future government spending. For our analysis, the index of main interest is the first component since it makes use of the written news media as a messenger (see Alexopoulos and Cohen 2009), to convey information underlying economic and policy predictability.

Based on computer automated search algorithms, the index quantifies references to uncertainty as found in news articles from ten major newspapers: USA Today, the Miami Herald, the Chicago Tribune, the Washington Post, the Los Angeles Times, the Boston Globe, the San Francisco Chronicle, the Dallas Morning News, the Houston Chronicle, and the Wall Street Journal. An article is considered relevant for the construction of this measure if it contains keywords related to all three categories: economy, uncertainty and policy. Specifically, for an article to be included in the sample, it has to contain at least one word from "economy, economic"; one word denoting uncertainty "uncertain, uncertainty"; and at least one policy term from the list "deficit, legislation, congress, white house, Federal Reserve, the Fed, regulations, regulatory, deficits, congressional, legislative, and legislature". The index has been adjusted for the changing volume of news over time.[9]

The EPU index has been found to spike near tight presidential elections, wars and terrorist attacks, the failure of Lehman Brothers, the 2011 debt-ceiling dispute and other major disputes over fiscal policy (for details see BBD). The index aims to measure the portion of the overall economic uncertainty attributed to the political and regulatory system. BBD perform numerous robustness checks. They show that the index conveys independent information on uncertainty, over and above the VIX index (a frequently used indicator of uncertainty computed from financial market data) and forecasts from the Survey of Professional Forecasters of government purchases. As we discuss in detail in the next section, we use variation in the timing of the interview and calculate for every household in the sample the prevailing EPU over the pre-interview period.

[9] For each of the ten newspapers, each month, the number of selected articles is scaled by the total number of articles in that newspaper and month. These individual series are then normalized to unit standard deviation over the period January 1985 to December 2009 and summed within each month. The resulting multi-paper index is then normalized to have an average value of 100 over the period January 1985 to December 2009.

From a household point of view, a direct measure of exposure to published news is the amount of time spent in reading newspapers. While it is reasonable to assume that a household that spends more time in reading newspapers than another household, should be exposed to more information contained in newspaper articles one may argue that the two households also differ on their ability to process the same amount of information.

To address potential concerns that information comprehension from written text varies with reader cognitive abilities and processing capacity, we estimate a fixed effects specification that takes into account fixed unobserved differences (e.g., in IQ) across respondents. Moreover, we explicitly control for variables that are shown in the reading research and cognitive psychology literature to be strong predictors for cognitive performance and reading comprehension. In particular, there is consensus that reading comprehension associates with readers decoding skills (the ability to read written words accurately) and language comprehension. In our estimation we take into account interviewer's assessment on every respondent's overall understanding.[10] This research also points to an association between performance on reading tasks and vocabulary and memory (for a review see Gersten et al. 2001), that we account for by the score achieved on a recall test and the interviewer's assessment on respondent's memory performance. Finally, existing studies show that cognitive abilities correlate with performance in numeracy tests that we also account for by using the relevant test score.

We define household exposure to EPU as the product of the news-based index with the time spent in reading newspapers. Obviously, the more time a household reads newspapers the more

[10] Language comprehension is usually represented either by a listening comprehension task that assesses how well the reader understands sentences and longer passages when they are presented orally rather than in written form as on reading comprehension tests; or by a combination of oral language measures. (for a meta-analysis see García and Cain 2014).

likely is to come across with newspaper articles that contain words about economic policy uncertainty. In Figure 1 we depict the EPU since 2001 and the interview months over which our sample spans. We also show summary statistics of the EPU over this period between interview and non-interview months (see Appendix Table A.1).

4. Empirical strategy

As discussed, HRS is a household panel survey that is conducted biennially and households are interviewed across different months during the survey interview year. Every fall in intermediate years between the baseline surveys, a random sub-sample of HRS respondents is asked to provide details on the time allocated in a number of activities.

The design of the survey offers an almost ideal set up in order to construct a measure of exposure to economic policy uncertainty news that is household-specific. For better exposition of the survey design, Figure 2 shows a time line of the interview phases. First, the survey records, in the fall of a given year (e.g., in 2001), the hours (per week) that households spend in reading newspapers. Second, starting in the first months of the follow-up year (2002), the survey contacts again households for the baseline interview. The baseline interviews, in which households indicate stock ownership and other asset investment, take place in different months in the course of the year. One should note that the month of the interview is exogenous to prevailing EPU. We exploit this random allocation of households in different interview months and calculate for each household the EPU index denoting the frequency counts of economic policy uncertainty news in the popular press over the months preceding the interview.

We measure every household's exposure to economic policy uncertainty news by defining the product of the hours (per month) spent in reading the news times the (monthly average of the)

EPU index measured over the period prior to the month of the interview. It is worth noting that the hours spent in reading newspapers are recorded shortly prior to the months over which EPU is computed, thus they should not be determined by follow-up variation in the EPU.

Our measure implies that between two households that spend the same amount of time in reading newspapers the one that experiences a higher EPU over the months prior to the (randomly assigned) interview month is exposed more to economic policy uncertainty news. Likewise, between two households that are interviewed on the same month (and thus experience the same EPU prior to their interviews), the one that spends more time in reading the news is assumed to be exposed more to economic policy uncertainty news. This notion follows the fact that two agents who are exposed to the same amount of information respond asymmetrically to negative and positive news.

Individuals' propensity to weight more the negative than the positive news has been widely documented in political science and psychology research. For example, Soroka (2006) shows that public concern tends to respond asymmetrically to positive and negative news and negative news receive more weight when attitudes are formed. Experimental studies also find evidence that the effect of a unit increase in negative news is larger than that of a unit decrease. Information pertaining to bad events receives more thorough and elaborate processing than information about good events, which in turn may lead to paying more attention to unfavorable information (Klinger et al. 1980; Baumeister et al. 2001). Such an asymmetry is also in line with the tenets of prospect theory and loss aversion (Kahneman and Tversky 1979).[11]

[11] Epstein and Schneider (2008) for example propose a model of information processing that focuses on investors' knowledge about signal quality. In their model, when the quality of news is hard to judge, investors will act on the worst-case assessment of quality. Good news will be considered hardly reliable while bad news will be evaluated as highly reliable. As a result, investors react more strongly to bad news than to good news.

Our household-specific measure of exposure to economic policy uncertainty news exhibits cross sectional and temporal variation in both its components (i.e. time spend in reading newspapers and the EPU index). Therefore, given that our sample is a panel, we can identify the effect of interest, while controlling for household fixed effects as well as for month-of-interview-year fixed effects. Household fixed effects allow us to take into account any household-specific, time invariant unobserved characteristics, such as preferences, that may correlate with stock investing. In addition, month-of-interview-year fixed effects absorb any aggregate time varying factors such as stock market performance that are likely to influence stockholding. The specification allows to identify separately the effect of hours spent in reading newspapers (through within household variation over time) while the effect of the EPU index alone is absorbed by the month-of-interview-year fixed effects. The estimated effect on the former term combined with that of the interaction term represent the influence of exposure to general information through newspaper reading.

Our unit of analysis is households, as stockholding and net wealth are defined at the household level. In non-single households, hours spent in reading newspapers and other demographics are defined over the financial respondent (i.e. the person in charge of managing the household finances). More specifically, we estimate the following double fixed effects specification:

$$Y_{i,t,m} = \beta_1 log\overline{EPU}_{t,m-1} * \log(hours\ reading\ newspapers)_{i,t-1} + \beta_2 \log(hours\ reading\ newspapers)_{i,t-1} + \beta_3 X_{i,t,m} + \alpha_i + \gamma_{t,m} + \varepsilon_{i,t,m}$$

where $Y_{i,t,m}$ is a binary indicator denoting ownership of stocks held directly or through mutual funds for household *i* that is interviewed in month *m* during the baseline interview year *t*. $\overline{EPU}_{t,m-1}$ is the average EPU evaluated over the months between January and the month prior to the interview month *m* for every household (i.e. $\frac{1}{m-1}\sum_{m=1,t}^{m-1,t} EPU_m$).[12] The hours per month that the financial respondent of household *i* spends in reading newspapers is recorded in the fall prior to baseline interview year (during which EPU is calculated) and is denoted by $hours\ reading\ newspapers_{i,t-1}$.[13] $X_{i,t,m}$ consists of an array of household-specific, time-varying characteristics, recorded in the month of the interview. The specification also accounts for individual fixed effects (α_i) which take into consideration all household-specific, time invariant unobserved factors. Moreover, it controls for month-year-of-interview fixed effects, which absorb any time-varying by month-year-of-interview factors ($\gamma_{t,m}$), including $\overline{EPU}_{t,m-1}$. Standard errors are clustered at the household and month-year-of-interview level to allow for possible cross-sectional and serial correlation dependence in the error term $\varepsilon_{i,t,m}$.

5. Results

Baseline results from different specifications are shown in Table 1. We first estimate a basic specification with the interaction term of interest, the hours reading newspapers as well as a full set of household and time fixed effects. We find that higher exposure to EPU makes stockholding less probable and the relevant effect is statistically significant at 1%. In particular, we estimate that a one-standard deviation increase over the mean EPU implies a 1.8 p.p. lower

[12] In the robustness section we show results from alternative specifications in which we define average EPU over three months and one month prior to every household interview.

[13] Hours reading news and hours spent in other activities (later used in robustness specifications) have been censored at the top 1% of the respective distributions to eliminate the influence of outliers.

probability of owning stocks directly or through mutual funds for a typical household with an average reading news time.[14] Given that 29% of households in the sample own such assets, the estimated effect implies a more than 6% net contribution to the unconditional ownership probability.

While it is beyond the scope of our study, one could also calculate the net implied effect of hours reading news by taking into account the estimates of both the interaction and the respective level term. According to these, an assumed one-standard deviation increase in the hours reading news, given a mean EPU, implies a 0.2 p.p. higher probability of owning stocks.

Next, we gradually augment specification (1) by adding a set of household-specific, time-varying controls.[15] In specification (2) we add a set of cognitive indicators. Cross sectional heterogeneity in cognitive abilities and financial sophistication have been shown to affect stockholding (see Christelis et al. 2010 and van Rooij et al. 2011, respectively). Given that we control for household fixed effects we would like to check whether our results are affected by households' time-varying ability to process information.

More specifically, we take into account a number of cognitive indicators. *Word recall score* measures memory capacity and denotes the number of words correctly recalled by the respondent out of a list of ten that is read by the interviewer. Numeracy score is a measure of respondents' mathematical skills denoting the number of correct answers to a numeracy test (five successive subtractions of the same number). Apart from these two measures we also take into account independent information based on interviewers' post-interview assessment as regards respondents'

[14] The calculation is based on mean (standard deviation) EPU of 120 (45) and the mean (monthly) reading news time of 20 hours.

[15] Given that we estimate a model with household fixed effects, we implicitly take into account a standard set of determinants used in (cross sectional) household finance studies, such as age, gender, race, religious denomination and education.

general understanding of questions and ability to recall information during the interview. We find that (time-varying) word recall ability associates positively with stockholding, nevertheless the inclusion of cognitive indicators does not alter the estimated relationship of interest.

In specification (3) we also add various time-varying demographic characteristics such as household size and labor status. In addition, we account for self-reported health and limitations in ADLs, as there is evidence to suggest that those in poor health are less likely to invest in stocks (Rosen and Wu 2004). To control for psychological outlook, we also include a dummy for feeling depressed most of the time over the week prior to the interview. We take into consideration the sociability indicator of Hong et al. (2004), namely whether respondents know their neighbors, as social interactions can induce stockholding by lowering information-related costs. In a similar vein, we control for regular Internet usage because there is evidence that it encourages stock ownership by facilitating access to financial information (Bogan 2008). In order to capture possible differences due to region-specific factors we include dummies representing the nine US Census divisions. We also control for whether respondents participate in voluntary organizations as a measure of social engagement and whether they intend to leave any bequests. While estimates on these controls display the expected signs they are mostly insignificant as we control for household fixed effects and standard errors are clustered at a higher than the household level.[16]

In specification (5), we control in addition for household stock market expectations.[17] It is instructive to control for expectations, as the effect we identify may reflect heterogeneity in expectations about the stock market prospects and not in uncertainty about economic policy *per*

[16] In the robustness section, we also present results with additional controls for risk aversion, social capital and optimism.

[17] Respondents are asked to report the percent chance in one year time the "mutual funds shares invested in blue chip stocks like those in the Dow Jones Industrial Average will be worth more than they are today" (i.e. at the time of the interview.

se.[18] The expectations question is asked in a random sub-sample of surveyed households in 2002 and 2014 surveys, while in addition there are many missing values (in roughly one third of responses) across all survey years.[19] As a result, specification (5) is estimated over a considerably smaller sample compared to the baseline one, but our main results remain resilient to this drop in the sample size. In addition, higher stock market expectations associate positively with the probability of investing in stocks.

Results from this specification point into the fact that household-specific uncertainty (second-moment) about economic policy has an independent effect on stockholding from household (first-moment) expectations regarding the stock market index level. Our finding provides support to the notion that the measure of exposure to EPU represents the uncertainty component and not a level effect of an (expected) negative macroeconomic shock. The distinction is important because shocks that slow down economic activity typically entail a first-moment (level) and a second-moment (uncertainty) component. While the former refers to changes in the level of various economic indicators, the latter relates to un-forecastable changes in the volatility of these indicators (see Bloom 2009, 2014).[20]

Last, as we use micro data and our measure of exposure to political uncertainty is household-specific, we can re-estimate the effect of interest for certain population subgroups. For example, we group households according to the education of their financial respondent into college

[18] BBD use information on forecasted federal purchases to account for firm future expectations. Our data allows us instead to control directly for household-specific stock market expectations.
[19] This follows the fact that a higher than usual number of respondents does not know to answer this question, while a significant fraction of those answering 50% indicate afterwards that they reported so because they were unsure about the chances (and thus are classified as missing).
[20] There is growing evidence that uncertainty rises during recessions, pointing to a feedback effect from recessions to uncertainty (see Bloom 2014 and Jurado et al. 2015). For example, at the start of the Great Recession, the series of negative events in financial markets represented bad news for the economy and also raised uncertainty. The induced economic downturn and policy responses reinforced uncertainty, which in turn amplified the initial market shock (Bloom 2017).

and less than college educated (27% and 73% of the sample, respectively). When we re-estimate our baseline specification (4) for each of these two groups we find that the interaction term of interest is significant only among the less than college educated.[21] While this evidence is based on two unbalanced samples, it seems to corroborate the so-called 'competence hypothesis' (Heath and Tversky 1991). According to this, agents tend to be more ambiguity averse towards tasks for which they feel less competent (as the less educated are likely to view complex investments such as stocks).

6. Robustness

In this section, we perform a number of robustness checks that provide additional support to our baseline findings. The first set of robustness checks examines the possibility of omitted aggregate factors (other than EPU), that, if they were interacted with hours spent in reading newspapers, they would have rendered the interaction term of interest insignificant. As discussed, any time-varying aggregate factors are absorbed by month-year-of-interview fixed effects. Nevertheless, some factors may still play a role through their interaction with hours households spend in reading the news.

To mitigate this concern we re-estimate our baseline specification (specification (4), Table 1), while controlling, in addition to the interaction term of interest, for a number of time-varying aggregate factors interacted with hours reading newspapers. [22] Results are shown in Table 2, while

[21] The estimated coefficients (standard error) we derive on the interaction and the hours reading news terms for the non college educated are -.0202 (.0093) and .0983 (.0438), respectively. The corresponding estimates for the college educated are -.0148 (.0165) and .0808 (.0766). The entire set of results in the two groups are available from the authors upon request.

[22] For symmetry, we assign each of these factors in an analogous way we assigned EPU to households. For example, real GDP growth is defined for every household as the average real GDP growth evaluated over the months running from January of the survey year to the month prior to the interview.

Table A.2 in the Appendix provides details on each of the indicators used. In the first specification, we add an interaction term of hours reading news with the SP500 index, in order to check whether stock market performance increases the likelihood of those who read news more to invest in stocks. Adding this interaction term leaves our estimate of interest virtually unaffected.

Next, we interact the number of hours reading newspapers with the VIX index (i.e. the 30-day implied volatility index on the S&P500 index options), which represents a common measure of uncertainty related to equity returns. The VIX correlates with EPU as both indices capture a common uncertainty component, nevertheless, as BBD show, the latter index measures additional uncertainty due to economic policy that is not captured by the former. When we control for both interaction terms, we find that the interaction term of the hours reading news with EPU is qualitatively unchanged and significant at 10%, while that with VIX is highly insignificant. This result suggests that the estimated effect on stockholding channeled through newspaper reading mainly regards the economic uncertainty due to government and regulatory policies and not due to equity returns per se.

Furthermore, we consider interaction terms of hours reading news with various other indicators such as professional forecaster disagreement about future CPI, oil prices, real GDP growth, federal funds rates and CPI. In all these cases, the inclusion of additional interaction terms leaves the baseline estimate of interest broadly unaffected.

In addition, we estimate a placebo regression in which we consider the EPU index calculated for Swedish newspapers (see Armelius et al. 2017). While this index displays a correlation of almost .5 with its counterpart one for the US, it does not have any independent explanatory power when it is interacted with hours that US households spend in reading (presumably domestic) newspapers.

The second set of robustness checks explores whether the interaction of the EPU index with time allocated into a number of (other than reading newspapers) activities has an independent effect on stockholding. As discussed, an advantage of our measure of household exposure to economic policy uncertainty is that it is constructed by combining two indicators that are conceptually well connected (i.e. the number counts of economic policy uncertainty news that appear in the US popular press and the number of hours spent in reading newspapers). Nevertheless, we wish to examine whether EPU could influence household stock investing through the time spent in other activities.

To this end, we re-estimate our baseline specification (specification (4), Table 1) by controlling for, one at a time, interaction terms of the hours spent in various activities with EPU. Results are shown in Table 3. First, in specification (1), we interact the hours spent in reading books with the EPU. Reading books represents an activity that is quite similar to newspaper reading and they should both correlate with a comparable set of household unobservables (e.g., time-varying intellectual curiosity). Nevertheless, the former activity should imply much less exposure to economic policy uncertainty news than the latter. Indeed, the estimated coefficient of the interaction term between time spent in reading books and the EPU is relatively small and highly insignificant (p-value = .69). Moreover, one should note that the corresponding level term is insignificant. These results lend further support to our baseline estimate capturing genuine effects.

Next, we experiment with interaction terms between the EPU and hours spent in 'using the computer' or 'watching programs or movies/ videos on TV' and neither of them is significant. While one cannot assume out some exposure to economic policy uncertainty news through these activities, it is quite unlikely to be as direct and strong it is through newspaper reading (which may well regard online articles). Likewise, we find no significant effects when we interact EPU with

hours working, hours socializing with friends, hours involved in voluntary activities, hours entertaining and hours sleeping.[23]

In the third set of robustness checks we add to our extended baseline specification (4) in Table 1 some additional household-specific covariates that may influence our results through their within-household variation over time. The first covariate regards an (inverse) risk aversion indicator. We recover this from a series of questions involving income gambles with mean preserving spreads which allow us to construct a four-scale indicator denoting willingness to assume higher risks.[24] HRS does not ask these questions since 2008 and onwards, while in the pre-2008 waves the questions are not always asked to both members in couples. We facilitate a sufficient number of observations on the risk aversion indicator by considering the value of the partner when the indicator is missing for the financial respondent in couples and by taking the minimum reported risk aversion over the years for which the relevant indicator is missing. In Table 4, specification (1) we show results when we add the (inverse) risk aversion indicator. We find that the estimate on the (time-varying) willingness to assume higher risks displays the expected sign but it is statistically insignificant, while our main result of interest remains unaffected.

The second covariate regards a social capital indicator. Trust and social capital in general have been shown to influence stockholding as they reflect households' perceptions about the likelihood of being cheated by financial intermediaries (see Guiso et al. 2008 and Georgarakos and Pasini 2011). Literature on social capital has established that trust in other people tends to change slowly over time, given that social capital entails a large inherited component of social values and

[23] Hours socializing with friends include hours spend in visiting friends, talking with friends over the pone, and helping friends, neighbors, or relatives who do not live with the respondent. Hours involved in voluntary work include hours doing voluntary work for charitable and other organizations, attending religious services, and attending meetings of clubs or religious groups. Hours entertaining include hours playing cards or games, attending concerts or movies, singing or playing a musical instrument, and doing art projects.

[24] We use the variable on risk aversion that has been constructed in the RAND version of the HRS.

norms (Tabellini 2010). Thus, household fixed effects in our specification should have captured most of the heterogeneity in trust. As HRS does not ask how much respondents trust other people in general, we control in our baseline specification for participation in voluntary organizations as a measure of social engagement. For robustness, we add in the baseline specification charity donations as an indirect measure of social capital.[25] Controlling for (time-varying) charitable contributions leaves our main results unaffected.

Last, we use as an indicator of (time-varying) optimism the self-reported probability to survive upon age 75 (which is the common age threshold with reference to which households across all survey years are asked to report their life expectancy). Our findings are unaffected when we re-estimate our baseline specification over financial respondents younger than 75 and take into account individual life expectancy.

The fourth set of robustness checks examines the possibility that households who decide to invest in stocks also decide to increase the hours reading the news in the popular press. To this end, we use information from a special question that asks households to report how closely they follow the stock market.[26] We find that taking into account changes in household propensity to follow stock market across waves leaves our estimates on the interaction term of interest and on the hours reading news unaffected.

Another way to address this issue as well as the possibility that the hours reading news vary due to fluctuations in EPU is to apply an IV estimation. In this context, an instrument should correlate with EPU (i.e. be relevant) but should not immediately affect how many hours

[25] The survey asks whether the respondent (or his spouse) has "donated any money, property, or possessions totalling $500 or more to religious or other charitable organizations".

[26] Survey respondents are asked to report "how closely do you follow stock market: very closely, somewhat, or not at all?". The question is not asked in 2002 and 2006 surveys; will fill in this gap by using the reported values in 2004 and 2008, respectively.

households read the news or correlate with household time-varying unobserved traits that affect stockholding. To this end, we use as an instrument an uncertainty indicator based on text analysis of the Federal Reserve Bank report known as the Beige Book.[27] The Beige Book is prepared and published before the regularly scheduled FOMC meetings, summarizing market experts', business contacts' and other sources' views on current economic conditions. We assume that the uncertainty contained in Beige Book correlates with economic policy uncertainty news published in the popular press, but it represents an exogenous source of information that presumably does not influence the hours that households read news.

When we use this IV approach in the double fixed effects specification (1) we derive an F-statistic of 118.6 from the first-stage regression (i.e. well above the rule of thumb threshold of 10 used to assess the strength of an instrument). According to the IV estimate from the second-stage regression an assumed one-standard deviation increase over the mean EPU, and for mean reading news hours, implies a 2.3 p.p. lower likelihood of owning stocks directly or through mutual funds (i.e. comparable to the estimated magnitude from the baseline specification).

As an additional robustness check, we re-estimate our baseline specification by using the lagged value of hours reading newspapers from the previous wave that a household participates in and interacting them with contemporaneous values of the EPU index.[28] Results are shown in Table 5. Despite the drop in the estimation sample, our findings are hardly affected. This suggests that the effects we identify are not driven by short-term variation in reading hours (that could be linked

[27] We use the BBD text-based uncertainty indicator for Beige Book report which they construct to show that correlates strongly with the EPU index. This alternative index counts the frequency of "uncertain" in each Beige Book report and it is subsequently normalized to account for the varying length of the reports and rescaled to preserve average frequency count per report. Given that these reports are published eight times per year we apply linear interpolation to deduce a monthly-based index.

[28] This means that we use hours reading reported (at least) two years before a given interview year. As a result, observations from the first wave (2002) and from households interviewed in only two waves cannot be used in the estimation.

to a change in stock ownership status or to short-term fluctuations in EPU), but instead by some longer-term cross-household heterogeneity.

On the other hand, we also experiment with an interaction term that matches hours reading newspapers with placebo values of the EPU index taken from the pre-interview period of the same household in the previous survey wave. In this case we find that the estimate of interest turns out to be, as expected, quantitatively unimportant and statistically insignificant.

The last set of robustness checks regards the calculation of the EPU for every household in our sample. In our baseline specifications we calculated the EPU as the monthly average over the months between January of the HRS baseline survey year and the month prior to every household interview. We re-estimate our baseline specifications using two alternative calculations for the EPU that is assigned to each household. The first regards the monthly average of the EPU calculated over the three months prior to each household interview. The second uses the EPU only from the month prior to the interview. We use these two alternative measures and re-estimate the entire set of five specifications shown in Table 1. The respective results for the three-month and one-month EPU are shown on the left and right hand side panels of Table A.3 and are broadly comparable to those we have discussed above.

7. Economic policy uncertainty and other financial asset holdings

In this section, we examine whether household exposure to EPU also affects ownership of stock IRAs and bonds. Note that recent studies have pointed into an asymmetry in household management towards different stockholding types (see Bilias et al. 2010). On the one hand, households tend to trade relatively frequently directly held stocks. On the other hand, households exhibit significant inertia in adjusting the risk composition of their retirement portfolios over long

periods in time (see Ameriks and Zeldes 2004). Consistent with considerable inertia in managing retirement portfolios, we find no effects of exposure to EPU on stock IRAs (results are shown on specification (1), Table 6).

Bonds typically represent a less risky investment alternative to stocks. Nevertheless, the influence of EPU on bondholding can be quite different for different types of bonds. The data allows us to distinguish between household investments in two types of bonds, namely government bonds and corporate bonds. US government bonds can be viewed as safe investments that should be little affected by EPU. By contrast, corporate bonds could be influenced by EPU to the extent to which prevailing uncertainty is likely to affect the issuing corporations. Moreover, corporate bonds represent more specialized and information intensive assets compared to government bonds. According to results shown on specification (2) of Table 6 we do not find a significant association between exposure to EPU and ownership of government bonds. On the other hand, we find that greater exposure to EPU reduces significantly the likelihood of holding corporate bonds. The implied effect due to a one standard deviation increase in EPU over mean EPU and for a household with average news reading time is -1 p.p. Given that only 6.6% of households own corporate bonds, the implied contribution of the assumed increase in EPU on the unconditional ownership probability is about 15%.

8. Conclusions

We use US survey data on households older than fifty years of age, a group that possesses a significant fraction of society's financial resources, to examine the extent to which prevailing policy uncertainty influences their asset choices. To this end, we create a novel measure of household exposure to EPU by combining information on the time households spend in reading

the news with the occurrence of words denoting political uncertainty in articles published in the popular press. We measure the latter using the BBD text uncertainty index calculated over the months preceding each household interview. The fact that both components of our measure vary across households and time allows us to estimate a double fixed effects model that takes into account both household-specific and time-varying unobserved heterogeneity.

We find that households that are exposed to higher EPU are less likely to own stocks directly or through mutual funds. In addition, they have a lower probability to own corporate bonds. On the other hand, we do not find any significant effect due to heterogeneous household exposure to EPU on the probability to own stock IRAs or government bonds.

Given that the measure of exposure to EPU is household-specific and that we use micro-level data, we are able to take into account household expectations about the future stock market level (first-moment) and show that they have an independent effect from uncertainty (second-moment) on the decision to hold stocks. In addition, we explore the role of EPU across different education groups and find evidence to suggest that exposure to uncertainty mainly influences stockholding among the less educated, in line with the tenets of the 'competence hypothesis'.

Our findings shed light on a channel through which policy uncertainty influences individual choices and assess household financial risk taking in response to EPU. More generally, our measure of household exposure to policy uncertainty may be used to study household decisions in contexts other than financial investing.

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Figure 1. EPU + interviews

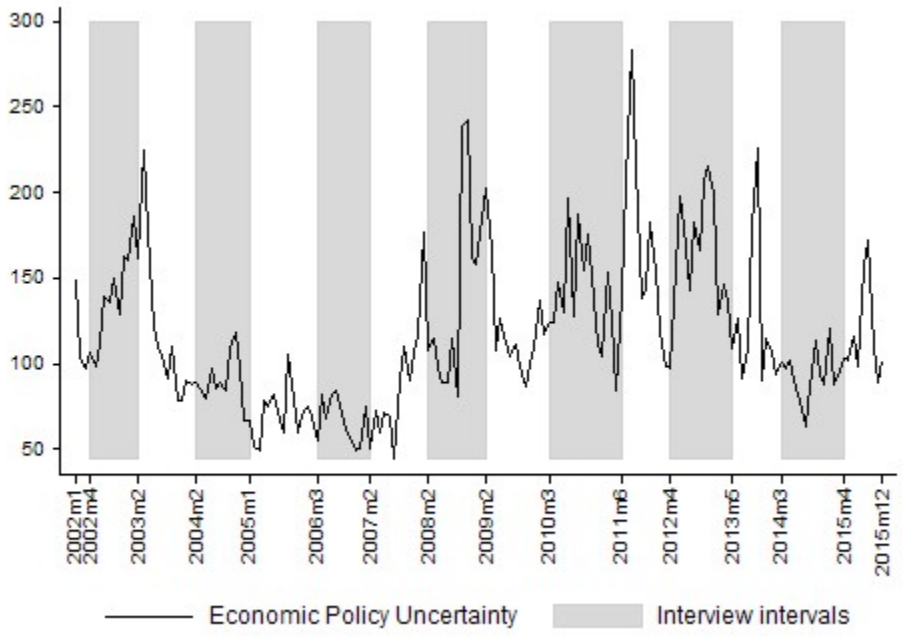

Figure 2. HRS and CAMS timeline

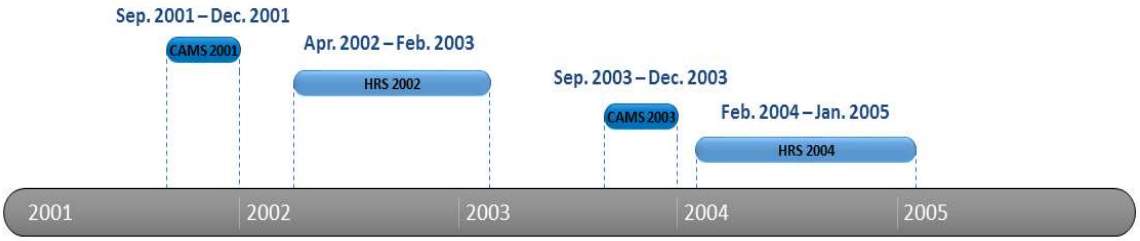

Table 1. EPU and stock ownership

	(1)	(2)	(3)	(4)	(5)
log (EPU) ×	-0.0183***	-0.0182***	-0.0196**	-0.0196**	-0.0239**
log (hours reading newspapers)	(0.0068)	(0.0069)	(0.0075)	(0.0075)	(0.0115)
log (hours reading newspapers)	0.0907***	0.0904***	0.0966***	0.0965***	0.1233**
	(0.0322)	(0.0324)	(0.0351)	(0.0351)	(0.0542)
Expected stock market up					0.0005***
					(0.0001)
Cognitive indicators					
Word recall score		0.0038**	0.0036*	0.0035*	0.0046
		(0.0018)	(0.0019)	(0.0019)	(0.0028)
Numeracy score		-0.0027	-0.0024	-0.0023	-0.0006
		(0.0021)	(0.0023)	(0.0023)	(0.0031)
No memory difficulties (interviewer)		-0.0076	-0.0096	-0.0095	0.0029
		(0.0087)	(0.0098)	(0.0097)	(0.0161)
Adequate understanding (interviewer)		-0.0021	-0.0050	-0.0047	-0.0033
		(0.0090)	(0.0101)	(0.0101)	(0.0152)
Income/wealth quartiles					
2nd Income Quartile				-0.0062	-0.0080
				(0.0081)	(0.0119)
3rd Income Quartile				0.0003	0.0035
				(0.0113)	(0.0141)
4th Income Quartile				0.0205	0.0066
				(0.0137)	(0.0177)
2nd Wealth Quartile				0.0136*	0.0110
				(0.0077)	(0.0125)
3rd Wealth Quartile				0.0140	0.0057
				(0.0120)	(0.0189)
4th Wealth Quartile				0.0091	0.0013
				(0.0151)	(0.0231)
Demographics	NO	NO	YES	YES	YES
Region fixed effects	NO	NO	YES	YES	YES
Household fixed effects	YES	YES	YES	YES	YES
Month-Year fixed effects	YES	YES	YES	YES	YES
Number of observations	21,642	21,451	19,797	19,797	11,725
Adj. R-Square	0.59	0.59	0.60	0.60	0.60

Note: Stock ownership refers to stocks held directly or through mutual funds. EPU is the monthly average EPU between January of the main survey year and the month prior to every household interview, calculated as in Baker et al. (2016). Double clustered standard errors by household and interview month in parentheses. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.

Table 2. Hours reading news interacted with various indicators

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log (EPU) × log (hours reading newspapers)	-0.0215*** (0.0078)	-0.0272* (0.0151)	-0.0186** (0.0078)	-0.0156** (0.0076)	-0.0189** (0.0083)	-0.0167** (0.0077)	-0.0210*** (0.0076)	-0.0195** (0.0075)
log (hours reading newspapers)	0.2186** (0.0914)	0.1068*** (0.0404)	0.1136** (0.0442)	0.1227*** (0.0367)	0.0933** (0.0395)	0.0840** (0.0358)	0.1052*** (0.0367)	0.0971 (0.0727)
log (SP500) × log (hours reading newspapers)	-0.0157 (0.0101)							
log (VIX) × log (hours reading newspapers)		0.0088 (0.0146)						
log (Prof_forecaster) × log (hours reading newspapers)			-0.0047 (0.0082)					
log (Oil) × log (hours reading newspapers)				-0.0104** (0.0050)				
real GDP gr × log (hours reading newspapers)					0.0002 (0.0008)			
log (int_rate) × log (hours reading newspapers)						0.0011 (0.0015)		
log (CPI) × log (hours reading newspapers)							-0.0009 (0.0018)	
log (EPU_SE) × log (hours reading newspapers)								-0.0002 (0.0163)
Cognitive indicators	YES	YES	YES	YES	YES	YES	YES	YES
Income/wealth quartiles	YES	YES	YES	YES	YES	YES	YES	YES
Demographics	YES	YES	YES	YES	YES	YES	YES	YES
Region fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Household fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Month-Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Number of observations	19,797	19,797	19,797	19,797	19,797	19,797	19,797	19,797
Adj. R-Square	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60

Note: See note in Table 1. Double clustered standard errors by household and interview month in parentheses. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.

Table 3. EPU interacted with hours spent in various activities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
log (EPU) × log (hours reading books)	-0.0034							
	(0.0067)							
log (EPU) × log (hours PC)		-0.0041						
		(0.0046)						
log (EPU) × log (hours TV)			-0.0007					
			(0.0086)					
log (EPU) × log (hours working)				-0.0067				
				(0.0045)				
log (EPU) × log (hours socializing with friends)					0.0001			
					(0.0087)			
log (EPU) × log (hours involved in voluntary/ religious activities)						0.0009		
						(0.0076)		
log (EPU) × log (hours entertainment)							-0.0073	
							(0.0087)	
log (EPU) × log (hours sleeping)								-0.0158
								(0.0114)
log (hours #)	0.0206	0.0230	-0.0003	0.0309	-0.0010	-0.0072	0.0288	0.0755
	(0.0315)	(0.0216)	(0.0405)	(0.0210)	(0.0410)	(0.0359)	(0.0414)	(0.0533)
Cognitive indicators	YES	YES	YES	YES	YES	YES	YES	YES
Income/wealth quartiles	YES	YES	YES	YES	YES	YES	YES	YES
Demographics	YES	YES	YES	YES	YES	YES	YES	YES
Region fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Household fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Month-Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES
Number of observations	19,737	19,799	19,741	19,910	19,396	19,392	19,647	19,748
Adj. R-Square	0.60	0.61	0.60	0.60	0.60	0.60	0.60	0.60

Note: See note in Table 1. Double clustered standard errors by household and interview month in parentheses. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.

Table 4. Additional time-varying covariates

	(1)	(2)	(3)	(4)
log (EPU) ×	-0.0225**	-0.0203***	-0.0201**	-0.0183**
log (hours reading newspapers)	(0.0091)	(0.0075)	(0.0088)	(0.0078)
log (hours reading newspapers)	0.1107**	0.0990***	0.1010**	0.0902**
	(0.0430)	(0.0352)	(0.0413)	(0.0369)
Willingness to take higher risks	0.0134			
	(0.0100)			
Charity donation		0.0179**		
		(0.0086)		
Life expectancy			0.0006*	
			(0.0003)	
Follow stock market				0.0442***
				(0.0069)
Cognitive indicators	YES	YES	YES	YES
Income/wealth quartiles	YES	YES	YES	YES
Demographics	YES	YES	YES	YES
Region fixed effects	YES	YES	YES	YES
Household fixed effects	YES	YES	YES	YES
Month-Year fixed effects	YES	YES	YES	YES
Number of observations	14,941	19,651	12,021	18,979
Adj. R-Square	0.60	0.60	0.58	0.60

Note: See note in Table 1. Double clustered standard errors by household and interview month in parentheses. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.

Table 5. Lagged hours reading news and lagged EPU

	(1)	(2)
log (EPU) × log (hours reading newspapers_lagged)	-0.0202**	
	(0.0088)	
log (hours reading newspapers_lagged)	0.0989**	
	(0.0416)	
log (EPU_lagged) × log (hours reading newspapers)		0.0008
		(0.0091)
log (hours reading newspapers)		0.0001
		(0.0432)
Cognitive indicators	YES	YES
Income/wealth quartiles	YES	YES
Demographics	YES	YES
Region fixed effects	YES	YES
Household fixed effects	YES	YES
Month-Year fixed effects	YES	YES
Number of observations	13,553	13,732
Adj. R-Square	0.62	0.62

Note: See note in Table 1. Double clustered standard errors by household and interview month in parentheses. ***, **, and * denote statistical significance at 1%, 5%, and 10%, respectively.

Table 6. EPU and ownership of various financial asset categories

	Stock IRAs	Government bonds	Corporate bonds
	(1)	(2)	(3)
log (EPU) ×	-0.0007	-0.0114	-0.0109**
log (hours reading newspapers)	(0.0073)	(0.0074)	(0.0043)
log (hours reading newspapers)	0.0024	0.0510	0.0493**
	(0.0346)	(0.0345)	(0.0203)
Cognitive indicators	YES	YES	YES
Income/wealth quartiles	YES	YES	YES
Demographics	YES	YES	YES
Region fixed effects	YES	YES	YES
Household fixed effects	YES	YES	YES
Month-Year fixed effects	YES	YES	YES
Number of observations	19,797	19,797	19,797
Adj. R-Square	0.60	0.49	0.43

Note: Stock IRAs refer to stocks held through IRAs. Government bonds refer to bonds.. Corporate bonds refer to .. See note in Table 1. Double clustered standard errors by household and interview month in parentheses. ***, **, * denote statistical significance at 1%, 5%, and 10% level of confidence.

Table A.1 Distributions, January 2001 - April 2015

	Nb. of months	min	p10	p25	p50	p75	p90	max	mean	sd
Panel A:										
EPU, interview phase	92	49.6	67.81	86.09	110.09	150.7	185.59	241.77	120.32	44.87
EPU, no interview	80	44.78	69.76	87.26	107.82	137.61	181.49	283.67	118.07	49.79
Total	172	44.78	69.49	86.23	108.45	144.92	184.82	283.67	119.28	47.1
Panel B:										
VIX, interview phase	92	10.82	12.3	14.02	17.29	22.31	32.22	62.64	20.42	10.19
VIX, no interview	80	11.05	12.78	14.82	20.23	24.98	31.96	44.8	20.94	7.23
Total	172	10.82	12.47	14.22	17.92	24.53	31.98	62.64	20.66	8.92

Table A.2 Data indicators: Description and sources

Variable	Description	Source
S&P500	S&P500 index, used from 4/2002 - 4/2015	SNP Real Time Price (^SP500TR). Currency in USD, retrieved from Yahoo Finance, March 1, 2017
VIX	Model free measure of the risk neutral implied volatility, calculated from S&P500 index options for a 30-day horizon and compiled by the Chicago Board Options Exchange (CBOE).	VOLATILITY S&P 500 (^VIX), Chicago Options Delayed Price, retrieved from Yahoo Finance, March 1, 2017.
Prof_forecaster	Forecaster disagreement about future CPI as developed by Baker et al. (2016)	www.policyuncertainty.com
Oil	Crude Oil Prices: West Texas Intermediate (WTI) - Cushing, Oklahoma, Dollars per Barrel, Monthly, Not Seasonally Adjusted	U.S. Energy Information Administration, Crude Oil Prices: West Texas Intermediate (WTI) - Cushing, Oklahoma [DCOILWTICO], retrieved from FRED, Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org/series/DCOILWTICO, March 29, 2017.
real GDP gr	Real Gross Domestic Product, Percent Change from Preceding Period, Quarterly, Seasonally Adjusted Annual Rate	U.S. Bureau of Economic Analysis, Real Gross Domestic Product [A191RL1Q225SBEA], retrieved from FRED, Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org/series/A191RL1Q225SBEA, April 6, 2017.
int_rate	Effective Federal Funds Rate, Percent, Monthly, Not Seasonally Adjusted	Board of Governors of the Federal Reserve System (US), Effective Federal Funds Rate [FEDFUNDS], retrieved from FRED, Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org/series/FEDFUNDS, March 29, 2017.
CPI	Consumer Price Index for All Urban Consumers: All Items, Percent Change from Year Ago, Monthly, Seasonally Adjusted	U.S. Bureau of Labor Statistics, Consumer Price Index for All Urban Consumers: All Items [CPIAUCSL], retrieved from FRED, Federal Reserve Bank of St. Louis, https://fred.stlouisfed.org/series/CPIAUCSL, April 21, 2017.
EPU_SE	Economic policyuncertainty index for Sweden as developed by Armelius et al. (2017)	www.policyuncertainty.com

Table A.3 EPU: different pre-interview periods

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
log (EPU_3m) × log (hours reading newspapers)	-0.0119** (0.0058)	-0.0118** (0.0058)	-0.0126** (0.0062)	-0.0124** (0.0062)	-0.0179* (0.0097)					
log (EPU_1m) × log (hours reading newspapers)						-0.0091* (0.0049)	-0.0090* (0.0049)	-0.0100* (0.0054)	-0.0099* (0.0054)	-0.0175** (0.0083)
log (hours reading newspapers)	0.0612** (0.0276)	0.0608** (0.0276)	0.0639** (0.0295)	0.0631** (0.0296)	0.0952** (0.0464)	0.0479** (0.0236)	0.0475** (0.0236)	0.0517* (0.0262)	0.0510* (0.0262)	0.0931** (0.0401)
Expected stock market up					0.0005*** (0.0001)					0.0005*** (0.0001)
Cognitive indicators	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES
Income/wealth quartiles	NO	NO	NO	YES	YES	NO	NO	NO	YES	YES
Demographics	NO	NO	YES	YES	YES	NO	NO	YES	YES	YES
Region fixed effects	NO	NO	YES	YES	YES	NO	NO	YES	YES	YES
Household fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Month-Year fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of observations	21,642	21,451	19,797	19,797	11,725	21,642	21,451	19,797	19,797	11,725
Adj. R-Square	0.59	0.59	0.60	0.60	0.60	0.59	0.59	0.60	0.60	0.60

Note: See note in Table 1. Double clustered standard errors by household and interview month in parentheses. ***, **, * denote statistical significance at 1%, 5%, and 10% level of confidence. EPU_3m refers to average EPU in last three months and EPU_1m refers to EPU in the last month.