Policy Uncertainty and Household Stock Market Participation

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Using a unique micro-level U.S. panel dataset, we show that households significantly reduce their participation in the stock market during periods of high policy uncertainty. This effect is exacerbated in more uncertain environment during close gubernatorial elections and elections where incumbent governors cannot seek reelections due to term limits. Households that have higher risk tolerance and possess better ability to acquire and process information are affected less by uncertainty. This evidence suggests both risk preferences and information costs explain why uncertainty affects participation. Decline in participation reverses after the election but not fully when there is less resolution in uncertainty due to a change in the ruling party.

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Low level of stock market participation is one of the major challenges of household finance, which has a potentially large welfare outcome (Campbell, 2006). Furthermore, limited stock market participation has been shown to have a direct impact on the magnitude of equity premium (Mankiw and Zeldes, 1991; Campbell, 1993; Constantinides and Duffie, 1996; Heaton and Lucas, 1999) and volatility of asset prices (Allen and Gale, 1994). Not surprisingly, theoretical literature has proposed explanations such as fixed participation costs and nonstandard preferences/expectations for households' limited participation in the stock market (e.g., Dow and Werlang, 1992; Haliassos and Bertaut, 1995; Vissing-Jorgensen, 2003; Ang, Bekaert, and Liu, 2005). Motivated by these theoretical studies, we identify an important factor, namely policy uncertainty, which can explain the variation in households' stock market participation. In particular, we address two research questions in this paper. First, does policy uncertainty affect households' stock market participation? Second, how does the uncertainty affect stock market participation? Specifically, do the differences in the household demographics that proxy for risk preferences and participation costs help explain the relation between policy uncertainty and stock market participation?

Policy uncertainty relates to the uncertainty regarding the political and regulatory system. Politicians and regulatory institutions frequently make decisions that can influence unemployment rate, tax and spending policies, business environment, and economic prospects (e.g., Peltzman, 1987; Alesina and Roubini, 1992; Besley and Case, 1995), which are all important sources of risks faced by households. The magnitude of uncertainty regarding who will make policy decisions, what policy actions will be undertaken and when, and the potential impact of policy decisions affect households' exposure to risks, which in turn can influence their demand for risky assets such as stocks. For example, Giavazzi and McMahon (2012), using German microdata, document that

household saving increases significantly following the increase in political uncertainty.[2] Furthermore, there is evidence that stock return volatility and correlations among stocks increase during periods of high policy uncertainty (Boutchkova et al., 2012; Pastor and Veronesi, 2012, 2013). Finally, a large strand of theoretical and empirical literature shows that individuals with risk aversion or uncertainty aversion demand a high equity premium to hold stocks, and therefore less likely to participate in the stock market.[3] Motivated by these arguments, we predict risk averse households would shy away from the stock market during periods of greater policy uncertainty.

In addition to heightened risks, during periods with high policy uncertainty, participation costs (including information costs related to acquiring and processing information) in stock market increase. This can be due to at least two potential reasons. First, uncertainty about the future change in policy weakens agent's prediction of future outcome, so that it weakens agent's decision-making ability (Starks and Sun, 2016). Second, greater uncertainty reduces the amount of information that market participants can generate about firms (Baloria and Mamo, 2017). In an environment where information costs for households to participate in the stock market increase, we predict households to be less likely to participate in the stock market.

We examine the effect of policy uncertainty on households' stock market participation by using two measures to capture uncertainty. The first one is gubernatorial elections. State governors have the chief authority over a state, with the ability to implement new policies and set budgets. During

[2] Another example (an anecdotal one) provides a similar intuition. "BlackRock's US Investor Pulse Study 2016 finds that nearly two-thirds, or 63%, of American investors say the upcoming Presidential election has impacted their investment decisions over the past year, and about a third of those surveyed feel the election poses a threat to their financial future. As a result, many investors are holding on to their cash -- with 26% telling BlackRock they had increased their cash positions." "It's clear that many Americans view the election as a source of uncertainty, making them less comfortable about investing," said Robert Kapito, president of BlackRock. (CBS News, October 13, 2016, "Clinton or Trump? Nervous U.S. investors await answer")

[3] See for example, Mankiw and Zeldes (1991), Dow and Werlang (1992), Attanasio and Browning (1995), Vissing-Jorgensen (2002), Easley and O'Hara (2009), Epstein and Schneider (2010), Dimmock et al. (2016).

the election process, politicians with likely different policy preferences are elected, which introduce uncertainty about all sorts of state-level policies including regulation, fiscal, monetary, trade policy, and taxation. The use of gubernatorial elections also offers some advantages for our empirical analyses. Gubernatorial elections are pre-scheduled and staggered across states and years, and are therefore mostly exogenous events associated with an increase in policy uncertainty (Atanassov, Julio, and Leng, 2016; Bird, Karolyi, and Ruchti, 2017; Jens, 2017). This allows us to separate out the effect of policy uncertainty from nationwide economic conditions and use a difference-in-differences (DiD) approach to allow a causal interpretation for our findings.

Second, we use the Economic Policy Uncertainty (EPU) index developed by Baker, Bloom, and Davis (2016).[4] The advantage of the EPU index is that it captures a broader level of policy uncertainty attributed to the political and regulatory system, that is not only associated with gubernatorial elections. It also provides variation in policy uncertainty for nonelection years. However, one empirical challenge in using this index is to separate the effect of policy uncertainty from general economic uncertainty. Following Gulen and Ion (2016) and Bonaime, Gulen, and Ion (2017), we address this issue by directly controlling for potentially confounding macroeconomic factors, and using political polarization as an instrumental variable to separate out the variation in the index attributable to policy uncertainty.

To capture households' stock market participation, we use the micro-level longitudinal Survey of Income and Program Participation (SIPP) data of the U.S. Census Bureau, which has been used in Chetty, Sandor, and Szeidl (2017). Using this data, we construct two measures for the propensity and the intensity of households' participation in the stock market. The first one is an indicator

[4] Papers using this EPU index to estimate the effect of policy uncertainty on various economic outcomes include Gulen and Ion (2016), Starks and Sun (2016), Bonaime, Gulen, and Ion (2017), Chan, Saffar, and Wei (2017), Jiang, Pittman, and Saffar (2017), and Tian and Ye (2017).

variable that equals one if the household holds any stocks in a publicly held corporation or a mutual fund over the interview period. The second measure reflects the value of equity investment as a fraction of the households' total liquid wealth (defined as the sum of safe assets - such as bonds, checking accounts, and savings accounts - and stockholdings) over the interview period. This data also includes information on households' demographic characteristics such as age, marital status, race, education, employment, labor income, and total wealth. Since households with different demographics have different sensitivities to stock market participation, we use this information for our cross-sectional tests to examine how policy uncertainty affects households' stock market participation.

Using gubernatorial elections and DiD approach, we find a significant 4.0% decrease in the probability of stock market participation, and a 5.8% decrease in the percentage of liquid wealth invested in the stock market for households in states with an upcoming gubernatorial election, relative to households in states without an upcoming election. These effects are after controlling for other factors that can influence stock market participation. These include demographic characteristics, macroeconomic conditions (state GDP growth, state unemployment, state housing price index appreciation), household-, state- and year-fixed effects. These results show that increased policy uncertainty associated with gubernatorial elections negatively affects households' tendency to invest in the stock market.

Closer elections and elections with incumbent governors prevented from reelections by term limits should create higher policy uncertainty ex-ante (Atanassov, Julio, and Leng, 2016; Bird, Karolyi, and Ruchti, 2017; and Jens, 2017). This, in turn, should be associated with a greater decline in stock market participation. Using close elections, we find that the decrease in the probability of stock market participation elevates to 10.3% from 4.0%, and that the decrease in the

percentage of liquid wealth invested in the stock market elevates to 12.5% from 5.8%. Both effects are more than twice the average effects documented for all gubernatorial elections. Similarly, using elections with incumbent governors that cannot seek reelection, we also find a greater decline in stock market participation (a 7.6% decrease in the probability of participation and a 12.5% decrease in the percentage of liquid wealth invested in the stock market). This evidence further strengthens the negative effect of policy uncertainty on households' stock market participation.

To shed light on why policy uncertainty affects stock market participation, we investigate the cross-sectional differences in households' sensitivities to policy uncertainty. Since we focus on the interactions between election and household demographics, we are able to use state×year fixed effects to further control for time-varying state shocks. Therefore, we can identify variations in stock market participation across households residing in the same state at the same point in time. This analysis provides evidence consistent with both participation costs and risk preferences influencing the households' decision to participate in the stock market. Specifically, households with lower costs of accessing and processing information to resolve uncertainty, and households with higher tolerance to risks associated with policy uncertainty, reduce their stock market participation less when facing greater policy uncertainty. We use gender, age, and wealth to proxy for tolerance to risks associated with policy uncertainty. We find households whose heads are male, younger, and wealthier are less negatively affected by policy uncertainty. Furthermore, education and financial occupation should help overcome the barriers of accessing and processing information to participate in the stock market. We find that household heads with financial occupation and more education are indeed less likely to decrease their participation in the market.

If elections are associated with heightened policy uncertainty, we would expect at least some of the uncertainty to be resolved after the election, and observe that the decline in participation

reverses. We find results consistent with this prediction. For the overall sample of elections, the post-election increase in stock market participation is almost the same as the pre-election decrease, suggesting a complete reversal in participation. However, for the subsample of elections where the ruling party changes, we do not observe a complete reversal. This evidence is again consistent with uncertainty affecting participation since, in this subsample, there is relatively lesser resolution of uncertainty after the election. This, in turn, implies that policy uncertainty can have a long lasting and disruptive effect on households' stock market participation.

Finally, we provide complementary evidence using the EPU index as another measure for policy uncertainty. Consistent with our findings using gubernatorial elections, we observe a significantly negative relation between the EPU index and both the propensity and intensity of households' stock market participation. At the mean of the EPU index, a one standard deviation increase in the index is associated with a 3.1% decrease in the probability of participation. Likewise, a one standard deviation increase in the index is associated with a 7.2% in the percentage of liquid wealth invested in the stock market. As mentioned before, one potential concern with using the EPU index is that such a policy uncertainty measure may be confounded by macroeconomic factors that affect the overall economic environment. Although we explicitly control for several such factors, to further alleviate potential endogeneity concerns about omitted unobservable variables driving both policy uncertainty and households' stock market participation, we show that our results hold in an instrumental variable (IV) framework. Specifically, following Gulen and Ion (2016), we use a measure of political polarization in the United States Senate as an instrument for policy uncertainty.

This study contributes to two broad strands of literature. The first explains the variation in households' stock market participation. A number of influential papers rely on fixed participation

costs to explain why households do not participate in the stock market to the extent that standard portfolio models would predict. Fixed participation cost can be a one-time entry cost, as well as ongoing participation costs, such as costs associated with acquiring and processing stock market information (Haliassos and Bertaut, 1995; Vissing-Jorgensen, 2002, 2003). Related to our study, Bonaparte and Kumar (2013) show that politically active people who follow political news more closely are more likely to participate in the stock market because they are more likely to be exposed to stock market information so that their information gathering costs are likely to be lower. Fixed participation costs can also be interpreted as an economist's description of psychological factors that make equity ownership uncomfortable for some households. For example, Hong, Kubik, and Stein (2004) find that households who interact less with other households in their community are less likely to own stocks. Some other studies argue that fixed participation costs can only be a partial explanation and propose using nonstandard preferences/expectations to explain the limited stock market participation. For example, Ang, Bekaert, and Liu (2005) develop a framework under which loss aversion can explain lack of participation. Barberis, Huang, and Thaler (2006), however, show that only the combination of loss aversion and narrow framing can induce individuals to stay away from the stock market. Furthermore, Dow and Werlang (1992), Epstein and Schneider (2002), and Easley and O' Hara (2008) argue that ambiguity averse agents would choose not to participate when the perceived ambiguity is too high. We build on these literature by providing new evidence on how policy uncertainty influences households' participation in the stock market. In particular, we provide supportive evidence in favor of both information costs and risk preferences determining the extent of stock market participation.

Second, our paper adds to the burgeoning literature where researchers link policy uncertainty with various economic outcomes. At the macroeconomic level, policy uncertainty influences

capital flows, drives business cycles, and impedes economic recovery (Baker et al., 2014; Baker, Bloom, and Davis, 2016; Julio and Yook, 2016). At the firm level, policy uncertainty affects cash holdings (Julio and Yook, 2012), stock prices and risk premia (Boutchkova et al., 2012; Pastor and Veronesi, 2012, 2013; Brogaard and Detzel, 2016), capital expenditures (Gulen and Ion, 2016; Jens, 2017), research and development (Atanassov, Julio, and Leng, 2016), equity issuance (Colak, Durnev, and Qian, 2016), and merger and acquisition activity (Bonaime, Gulen, and Ion, 2017). At the household level, Giavazzi and McMahon (2012), using the German general election held in September 1998 and German microdata on households, document that household exhibit precautionary savings behavior when the political uncertainty increases. We complement this literature by examining the effect of policy uncertainty on household finance in general, and on stock market participation specifically.

This paper proceeds as follows. Section 1 describes the data and construction of the key variables. Section 2 examines the effect of greater policy uncertainty during gubernatorial elections on the propensity and intensity of households' stock market participation. In Section 3, we provide complementary evidence on the relation between policy uncertainty and stock market participation using another proxy of policy uncertainty, namely the EPU index. We conclude in Section 4.

1. Data and variable construction

1.1 SIPP panel data

To quantify the effect of policy uncertainty on households' propensity to participate in equity markets, we use the micro-level longitudinal Survey of Income and Program Participation (SIPP) data of the US Census Bureau.[5] Our sample of households is drawn from the 1996, 2001, 2004

[5]Each SIPP panel is a multi-stage stratified sample of U.S. civilian, non-institutionalized population. The longitudinal design of SIPP dictates that all persons 15 years old and over, present as household members at the time of the first interview be part of the survey throughout the entire panel period. To meet this goal, the survey collects information

and 2008 panels, which cover 1996-2000, 2001-2003, 2004-2007, and 2008-2013 waves.[6] The SIPP surveys are built around a core set of questions on demographic attributes, employment and income, business ownership. Moreover, each wave also includes topical modules which are conducted annually and include detailed questions on assets and liabilities — such as the ownership and market value of different types of assets, including real estate, vehicles, and financial assets. Our analysis is conducted at the household level and includes only household heads who are 18 or older.

As is common in the literature (e.g., Guiso, Sapienza, and Zingales, 2008; Giannetti and Wang, 2016), we use two proxies for stock market participation. Our first proxy, *Participation*, is an indicator variable that equals one if the household holds any stocks in publicly held corporation or mutual funds in a given year (extensive margin). We also separately gauge how policy uncertainty affects the extent of stock market participation through households' equity holdings (intensive margin). For this purpose, we define *% Stock share*, which reflects the value of equity investment as a fraction of the household's total liquid wealth as of the last day of the reference period (see Appendix for a list of variable definitions).

For the purpose of our study, following prior literature (Kozak and Sosyura, 2015; Chetty, Sandor, and Szeidl, 2017), we exclude stock investments in households' pension accounts or IRAs for

useful in locating persons who move. In addition, field procedures were established that allow for the transfer of sample cases between regional offices. Persons moving within a 100-mile radius of an original sampling area (a county or a group of counties) are followed and continue with the normal personal interviews at 4-month intervals. Those moving to a new residence that falls outside the 100-mile radius of any SIPP sampling area are interviewed by telephone. The geographic areas defined by these rules contain more than 95 percent of the U.S. population.

[6] In general, one cycle of four interviews covering the entire sample using the same questionnaire is called a wave. Note that in the SIPP surveys households are interviewed at four-month intervals over a number of years, and they are asked questions covering the reference period which is the four-month period preceding the interview. For example, households interviewed in February 2005 were asked questions for the months October, November, and December in 2004, and January 2005. This household was interviewed again in June 2005 for the February through May period. The sample households within a given panel are divided into four samples of nearly equal size. These subsamples are called rotation groups and one rotation is interviewed each month.

several reasons. First, prior literature shows that households do not actively rebalance or trade in their retirement accounts (Agnew, Balduzzi, and Sunden, 2003; Mitchell et al., 2006; Benartzi and Thaler, 2007). Second, withdrawals of money from retirement accounts often incur significant penalties. Third, default choices have been shown to affect investments in the retirement accounts (Beshears et al., 2009). Finally, the SIPP data does not contain information on portfolio allocations within retirement accounts, so we cannot separate investments in stock market from investments in other markets within these accounts. Our final sample of households include 359,260 household-year observations for 152,095 unique households.

The SIPP identifies owners of home, other real estate, business, and vehicles owned on the date of the interview. We exploit this data to compute *Total wealth* for each respondent in our sample, which includes financial assets as well as all real estate (including second homes), vehicles, and private business equity. We also categorize total wealth into different types of assets, namely, *Liquid wealth; Home equity; Equity in vehicles; Business equity;* and *Equity in other real estate*. In addition, we extract information on *Labor income* from gross monthly earnings (before deductions), or for those paid on hourly basis from the regular hourly pay-rate and the number of hours worked.

Our data identify a worker's employer, the employer's 3-digit Census Industry Classification (CIC), and the Integrated Public Use Microdata Series (IPUMS) code for the worker's occupation. To measure financial literacy, we use an indicator variable equal to 1 for the household head in a finance related occupation (*Financial occupation*). Finally, our empirical specification recognizes there are additional individual characteristics that may impact the propensity of stock market participation. We consider a wide set of variables that are available in our survey such as age, education, race, gender, and marital status (Haliassos and Bertaut, 1995; Guiso and Jappelli, 2002;

Campbell, 2006). For human capital, we identify various levels of formal education *(High school or less*; *Some college*, and *College or more*). We categorize age as *Old* (those with household heads aged above 60), *Middle aged* (those with household heads aged between 35 and 60), and *Young* (those with household heads aged between 18 and 34).

Table 1 reports the summary statistics of the household variables. On average, about 22.3% of the households participate in the stock market during our sample period, and the average stock investment ratio is 10.4%.[7] 4.1% of the households are employed in a finance related job, and 53.1% of respondents are married. The mean total wealth of all respondents is about $189K and significantly exceeds the median total wealth (of about $66K), indicating a significant right skew in the distribution. The mean liquid wealth is about 17% of total wealth and is also significantly right skewed. We observe that respondents' principal source of non-financial wealth is from home equity, and there is non-trivial equity in other real estate assets.

Turning to wage and education, the median labor income is less than the mean, indicating a right skew in the distribution. In terms of formal educational attainment, 39% of our sample has not gone beyond high school and 70% of the sample has not completed college. It is worth noting that the distribution of educational attainment in our sample is close to the corresponding average distribution for 1996-2013 for individuals 25 years and older. In terms of personal demographics, 18% are African-American, 51% are female, 53% are married, and about 40% of the sample is in the 18-45 age group, while a third is in the 45-65 age group.

1.2 Election data

[7] Our sample summary statistics match with those in Chetty, Sandor, and Szeidl (2017); see Appendix DI, where they find 19.18% of households hold stocks and 12.27% of households' liquid wealth invested in stock market for the 1990 to 2008 SIPP data.

Gubernatorial elections are pre-scheduled and unlike presidential elections, gubernatorial elections in different states occur in different years, creating a substantial across- and within-state variations in addition to the time series variation in the timing of elections. Currently, the majority of the states hold gubernatorial elections every four years, with the exception of Vermont and New Hampshire, which choose to run their gubernatorial elections every two years. Five states, including Louisiana, Kentucky, Mississippi, New Jersey, and Virginia, elect their state governors in odd numbered years, whereas other states run their gubernatorial elections in even-numbered years. Currently, governors of 36 states are subject to various term limits, while the governors of 14 states may serve an unlimited number of times. Our main source of data on gubernatorial elections is from the Correlates of State Policy Project (CSPP) initiated by the IPPSR (Institute for Public Policy and Social Research). The dataset includes more than nine-hundred variables, with observations across the U.S. 50 states and time (1900–2016). These variables represent policy outputs or political, social, or economic factors that may influence policy differences across the states (Jordan and Grossman, 2016). We augment CSPP data with hand-collected vote margin and political party-affiliation data.

The U.S. Census Bureau masks the identification of four small states (North Dakota, South Dakota, Maine, Vermont) to help protect the confidentiality of respondents, leaving us 828 gubernatorial elections in our IPPSR sample. *Election* is a binary variable equal to one if a state elects a governor in a year, and *Presidential* is a binary variable equal to one if a presidential election occurs in a year. Following the identification of Julio and Yook (2012) and Jens (2017), we classify an election as being more uncertain if it is a close election, where the victory margin, defined as the percentage vote difference (difference between the percentage of votes obtained by the first and second place candidates) for an election is in the lowest sample tercile of vote

differential. We also distinguish elections where incumbents are eligible for re-elections from elections where incumbents face term limits (*Lame duck last term*). Table 2 indicates that there were 202 gubernatorial elections held between 1996–2013, of which 65 are defined as close. While the average vote differential between the first and second place candidates is 3.73% for close elections, this margin escalates to 22.59% for non-close elections. In 56 elections, incumbent governors do not seek re-election due to term-limit expirations.

As mentioned in Section 1.1, in SIPP surveys, households are interviewed at four-month intervals over a number of years, and they are asked questions covering the reference period, which is the four-month period preceding the interview. When we merge the SIPP panels with IPPSR data, we verify that reference months over which households are interviewed precede the election month in a given state. For example, a gubernatorial election was held on November 3, 1998 in New Hampshire whereas a subsample of SIPP households were interviewed (on topical module Assets, Liabilities, and Eligibility) in March 1999 for the months of November and December in 1998, and January and February in 1999 as their reference months. Since reference period for these households ends after the election month, these respondents are considered to be in an off-election year.

1.3 State macro data

We use data on state unemployment (*Unemployment*), state GDP growth rate (*State GDP growth*), and appreciation in state housing price index (*State HPI appreciation*) to proxy for time-varying economic conditions within a state. Annual state unemployment data are from the Bureau of Labor Statistics (BLS), annual state GDP growth is available from the Bureau of Economic Analysis (BEA), and State HPI appreciation is obtained from the Federal Housing Finance Agency. Untabulated results indicate the GDP growth, unemployment rate, and appreciation in HPI to be

2.5%, 5.6%, and 3.5%, respectively, for an average state.

1.4 Policy uncertainty index and macroeconomic data

For the second part of our analysis, we use the policy uncertainty measure from Baker, Bloom, and Davis (2016), which we call EPU index.[8] The EPU index is calculated as a weighted average of (1) *News component*: the frequency of articles related to policy uncertainty in ten leading U.S. newspapers, (2) *Tax code component*: tax code change uncertainty, using data from the Congressional Budget Office, (3) *Monetary policy component*: monetary policy forecast disagreement, which draws on the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters, and (4) *Government spending component*: fiscal policy forecast disagreement. The overall index significantly correlates with events expected to generate policy-related uncertainty, and its components capture specific types of policy uncertainty. A more thorough discussion of the methodology used to calculate the policy uncertainty index can be found in Baker, Bloom, and Davis (2016).

To match the monthly frequency of policy uncertainty index to our survey data, we use simple average of EPU index over the four-month period preceding the interview (which also is the reference period in the SIPP panels). To account for the possibility that more recent levels of uncertainty may have a stronger effect on households' investment decisions, we also take a weighted average of the index in the four-month reference period, using the weights 1/2, 1/3, 1/9, 1/18 as weights (see Gulen and Ion, 2016). Results are reported only for the first method, but our results are qualitatively and quantitatively similar when we adopt the weighted average of the

[8] We thank Scott Baker, Nick Bloom and Steven Davis for making the index and its components available at http://www.policyuncertainty.com/.

index. We present summary statistics on the overall index, its components, and macro measures in Table 7.

2. Gubernatorial elections and stock market participation

In this section, we examine the relation between the policy uncertainty as captured by the gubernatorial elections and households' propensity and intensity of stock market participation. We start with the baseline model in Subsection 2.1 followed by the study of close elections and elections where the incumbent governor cannot stand for re-election in Subsection 2.2, and investigation of the cross-sectional differences in the effect of policy uncertainty on stock market participation in Section 2.3.

2.1 Baseline model and results

To study the causal effect of policy uncertainty on households' stock market participation, we exploit a quasi-natural experiment using the U.S. gubernatorial elections to identify a relatively straightforward and observable source of policy uncertainty. The setting with gubernatorial elections has several advantages. First, gubernatorial elections are pre-scheduled, and not driven by the economic conditions in the states. Therefore, such elections are arguably mostly exogenous events associated with an increase in policy uncertainty (Atanassov, Julio, and Leng, 2016; Bird, Karolyi, and Ruchti, 2017; Jens, 2017). Second, gubernatorial elections are staggered across states and years (including different business cycles, and financial market booms and busts). As described earlier in the data section, there is significant cross-sectional variation in both the frequency and years in which different states hold gubernatorial elections. We use a DiD approach, which allows us to separate out the effect of policy uncertainty from both the nationwide economic

condition (which will be the same for treatment and control states at a given point in time) and net out any pre-existing differences between states. Specifically, we estimate the following model:

$$StockMktPart_{i,s,t} = \beta_0 + \beta_1 Election_{s,t} + \mathbf{X}'_{i,s,t}\,\beta_2 + \delta_s + \mu_t + \alpha_i + \varepsilon_{i,s,t} \quad (1)$$

In this model, households in states without an upcoming election in a given year *t* serve as the control group for a treated sample of households in states about to elect a governor during the same year *t*. Our key dependent variable is $StockMktPart_{i,s,t}$ that measures the stock market participation of household *i* in state *s* as of the last day of the reference period that precedes the election in year *t*. We use two different versions of the dependent variable. The first one, $Participation_{i,s,t}$, is an indicator variable that takes a value of one if a household *i* from state *s* invests in the stock market as of the last day of the reference period preceding the election in year *t*, and zero otherwise. This variable captures the propensity of a household's participation in the stock market. The second variable, $\%Stockshare_{i,s,t}$, captures the intensity of investments in stock market, defined as the percentage of liquid wealth invested in stocks and mutual funds by household *i* from state *s* as of the last day of the reference period preceding the election in year *t*. Our key independent variable of interest is $Election_{s,t}$, which takes a value of one if the state *s* in a given year *t* has a gubernatorial election, and zero otherwise.

Following the literature (e.g., Giannetti and Wang, 2016; Chetty, Sandor, and Szeidl, 2017), the vector of control variables, $\mathbf{X}_{i,s,t}$, includes a rich set of time-varying household- and state-level observable variables related to both the propensity and intensity of households' stock market participation. Household variables include financial wealth, total wealth, labor income, age, education level, as well as respondents' marital status, financial occupation, race and gender,

where the last three controls are subsumed by the household-fixed effects. State-level variables include state GDP growth, state unemployment rate, and state housing price index (*HPI*). We further include state fixed effects (δ_s) to control for time-invariant state characteristics, year fixed effects (μ_t) to control for macroeconomic conditions (excluded when we control for presidential election year), and household fixed effects (α_i) to control for time-invariant household traits. Following Giannetti and Wang (2016), we estimate regression (1) using ordinary least squares even when the dependent variable is an indicator variable since our specifications include fixed effects. We cluster standard errors at the state level to account for the correlations in households' decisions to participate in the stock market from the same state.

Table 3 presents the results for a DiD estimation in equation (1). Columns (1) and (2) report results for whether a household participates in the stock market. Estimated slope coefficients on *Election* are negative and significant at the 5% level (coeff. = –0.009 and –0.007 in Columns (1) and (2), respectively). This suggests that households in a given state are less likely to participate in the stock market in the period prior to that state holding gubernatorial elections in a given year. These findings are also economically large. Conditional on an election in a state, the rate of stock market participation goes down by 70 to 90 basis points, which implies a decrease of 3.1% to 4.0% in the unconditional probability of stock market participation at the mean (22.3%).

We draw similar inferences based on the findings for the intensity of a household's investments in the stock market, reported in the last two columns of Table 3. Estimated slope coefficients on *Election* continue to be negative and are even more significant at the 1% level (coeff. = –0.006 for both Columns (3) and (4)). These results imply that the percentage of a household's liquid wealth invested in the stock market (*% Stock share*) also decreases during periods of high policy

uncertainty. Again, these results are economically meaningful. Compared to a non-election year, in the election year, there is a decrease of 60 basis points in *% Stock share*, which corresponds to a 5.8% decrease in the level of investments in stocks and mutual funds that have a mean of 10.4%. The signs for the estimated coefficients on control variables are broadly consistent with the prior literature. Head of households who are married, have higher level of education, have higher labor income, aged between 18 and 60, and with higher wealth tend to have higher stock market participation (Grinblatt, Keloharju, and Linnainmaa, 2011; Giannetti and Wang, 2016).

Among state-level economic variables, state GDP growth and state HPI are positively related to stock market participation, while state unemployment rate is negatively related to stock market participation. This finding is intuitive, as better economic conditions in the state should enhance participation in equity markets. Furthermore, as expected, the presidential election, another source of policy uncertainty but nationwide, has a negative relation with households' stock market participation.

Overall, our baseline results show that increased policy uncertainty associated with gubernatorial elections leads to a decreased participation in the stock market, either reflected in the lower average participation rate in the stock market or decreased percentage holding in stocks.

2.2 Further evidence from close elections and term limits

To help establish that it is the policy uncertainty associated with gubernatorial elections that influences stock market participation, rather than the elections themselves, we exploit data on close elections and term limits. Following Atanassov, Julio, and Leng (2016), Bird, Karolyi, and Ruchti (2017), and Jens (2017), we identify two scenarios that are likely to be associated with greater policy uncertainty. These include close elections and elections where incumbents cannot stand for

reelection due to term limits. Therefore, we should expect to observe a stronger effect on households' stock market participation in both these cases.

Close elections are elections with lower vote differential between the first and second place candidates. Such elections can therefore create a higher level of policy uncertainty *ex-ante*. We define *Close election* as one if the vote differential for an election is in the lowest tercile, which is 3.73% compared to a 22.59% victory differential for non-close elections. For brevity, we present only the estimated coefficients on the *Election* and the *Close election* from the DiD estimation for stock market participation in Table 4. The estimated coefficients on *Election* remain negative and significant, ranging from –0.004 to –0.007 in Columns (1) through (4). The coefficient on the *Close election* should capture the incremental effect of a close election over and above the effect of a non-close election on stock market participation. The negative and significant coefficients of –0.016 and –0.017 in Columns (1) and (2) indicate an additional decrease of 160 and 170 basis points (over the 70 and 50 basis points for non-close elections) in the probability of a household's stock market participation. Therefore, the total effect of a close election is 220 to 230 basis points decrease in the probability of stock market participation. These figures correspond to a 9.9% to 10.3% decrease in the unconditional probability of stock market participation at the mean (22.3%). We observe a similar negative relation between close election and the percentage of a household's liquid wealth invested in the stock market in Columns (3) and (4). Both the models indicate a 90 basis points decrease in percentage of liquid wealth invested in the stock market. The total effect adds up to a decrease of 130 to 140 basis points (after adding the 50 and 40 basis point effect for non-close elections), which represents a 12.5% to 13.5% decrease in the average percentage of liquid wealth in the stock market (10.4%).

Moving on to our second case associated with greater policy uncertainty, we investigate term limits that prevent the incumbent governor from seeking re-election. Given the well-documented incumbency advantage (Erikson, 1971; Gelman and King, 1990), incumbents overwhelmingly win re-election. In our sample, incumbents win reelection 83% of the time. Hence, policy uncertainty can exacerbate when the incumbent governor is in his/her last term. Term limits are also plausibly exogenous because term limit laws are specified in state constitutions, and are therefore unlikely to be amendable by either governors or households to further their own interests. We define a variable *Lame duck last term* as an indicator variable equal to one if the incumbent governor is in his/her last term in a given year, and zero otherwise.

Table 5 presents the results. For brevity, we only report estimated coefficients on the *Election*, *Lame duck last term*, and the interaction term between *Election* and *Lame duck last term*. As in earlier specifications, the coefficient on *Election* continues to be negatively significant. The interaction term between *Election* and *Lame duck last term* has a significantly negative sign ranging from –0.008 to –0.011 in Columns (1) through (4). This shows an incremental effect of the elections on stock market participation in those election years where incumbent governors are serving their last terms. Moreover, the *Lame duck last term* does not have a significant relation with households' stock market participation, which implies that term limit by itself does not influence participation during non-election years. The total effect of elections with lame duck incumbent are 160 to 170 basis points decrease in the probability of a household's stock market participation and 100 to 130 basis points decrease in the percentage of liquid wealth invested in the stock market (after adding the coefficients on *Election* and the interaction of *Election* and *Lame duck last term*). These imply a 7.2% to 7.6% decrease in the unconditional probability of stock

market participation (22.3%) and 9.6% to 12.5% decrease in the unconditional percentage of liquid wealth invested in the stock market (10.4%).

Taken together, results in this section show that it is not the elections themselves but the policy uncertainty associated with the elections that drive the stock market participation of households, further strengthening the causal interpretation of our findings.

2.3 Household demographics and sensitivity of participation to policy uncertainty

In the previous subsections, we exploit time-series variation in policy uncertainty across states and show that, on average, uncertainty has a negative impact on both the probability and intensity of households' investments in the stock market. In this part, we exploit the within-state cross-sectional differences in households' sensitivities to policy uncertainty. We expect to observe cross-sectional variation in households' capability of dealing with policy uncertainty due to the differences in their demographics. This, in turn, can affect the sensitivity of their stock market participation to policy uncertainty. Households' capability to deal with uncertainty should be related to their tolerance to risks associated with policy uncertainty and costs of accessing and processing information to resolve uncertainty.

Both theoretical and empirical literature has shown cross-sectional variation in the risk aversion because of the demographical differences. Women are generally perceived to be more risk averse than men, consistent with a large body of empirical and experimental evidence (for instance, Barber and Odean, 2001; Barsky et al., 1997; and Powell and Ansic, 1997). It is also well documented in the U.S. and European countries that wealthy households exhibit greater propensity to take risk in their portfolios (Campbell, 2006; Carroll, 2002). Wealthy households participate more in the stock market and have a greater percentage of their investments in risky asset classes.

Theoretical literature also argues that there should be age effects on portfolio choice if older investors have shorter horizons than younger investors do and investment opportunities are time varying, or if older investors have less human wealth relative to financial wealth compared to their younger peers (Bodie, Merton, and Samuelson, 1992; Campbell and Viceira, 2002). Consistent with these theories, empirical evidence from the US and other countries shows that age has a negative effect on stock market participation (Banks and Tanner, 2002; Bertaut and Starr-McCluer, 2002; Campbell, 2006; Guiso and Jappelli, 2002; and Iwaisako, 2003). Motivated by this body of theoretical and empirical literature, we hypothesize that households whose heads are male and younger, and who are wealthier to be more tolerant to risks associated with policy uncertainty, and therefore react less negatively to policy uncertainty associated with elections, i.e., participate more in the stock market compared to their counterparts.

Another aspect of demographics we expect to affect the sensitivity of investment decisions to policy uncertainty is related to the costs of accessing and processing information to resolve uncertainty. Theory indicates that frictions like information costs could result in low stock market participation rates (Haliassos and Bertaut, 1995; and Vissing-Jorgensen, 2003). Uncertainty about the future change in policy weakens agent's prediction of future outcome, so that it weakens agent's decision-making ability (Starks and Sun, 2016). Also, Baloria and Mamo (2017) show that greater policy uncertainty during elections reduces the information that market participants can generate about firms. Specifically, they find that analyst forecasts are less accurate for such firms during elections. We hypothesize that households with lower information costs should be affected less by policy uncertainty compared to their peers. Following prior literature (Haliassos and Bertaut, 1995; Bertaut, 1998; Vissing-Jorgensen, 2003; Bertaut and Starr-McCluer, 2001), we use two proxies for information costs. Our first proxy is the education level of household heads, which

helps in overcoming the barriers to hold stocks due to ignorance and misperceptions. Our second proxy is the financial occupation of household heads, which reflects both a higher level of financial literacy and easier access to information.

We examine the differential sensitivities of households' stock market participation to policy uncertainty based on the household demographics by estimating the following regression:

$$StockMktPart_{i,s,t} = \phi_0 + \phi_1 Election_{s,t} \times Demographics_{i,s,t} + \mathbf{X}'_{i,s,t}\phi_2 + \nu_{s,t} + \alpha_i + \varepsilon_{i,s,t} \qquad (2)$$

where $Demographics_{i,s,t}$ is a vector of demographic characteristics for household *i* from state *s* in year *t*, $Election_{s,t} \times Demographics_{i,s,t}$ is the interaction of $Election_{s,t}$ and $Demographics_{i,s,t}$, $\nu_{s,t}$ are state × year fixed effects. Other variables are as defined earlier for regression in equation (1). Note that to control for any time-varying state characteristics and economic conditions, we include state-year fixed effects here since we focus on $Election_{s,t} \times Demographics_{i,s,t}$ (unlike in equation (1) where coefficient on $Election_{s,t}$ is of primary interest to us). In such a set-up we cannot estimate the direct effect of $Election_{s,t}$ on stock market participation decision of households, but incorporating the interaction terms is potentially important because it ensures that our effects are not simply driven by households reacting differently to time-varying local shocks. That is, we can difference out unobserved time-varying local shocks through state × year fixed effects.

Table 6 presents the results for cross-sectional differences in the effect of policy uncertainty on household stock market participation. For brevity, we only report the interaction terms between different demographic characteristics and *Election* in the table. Columns (1) and (2) report the results for the probability of stock market participation and the percentage of liquid wealth invested in the stock market, respectively. Consistent with our hypotheses, we find that households where

the heads are male, younger, and with higher total wealth, react less negatively to policy uncertainty, i.e., they are more likely to participate in the stock market compared to their peers when uncertainty increases. Specifically, the estimated slope coefficients on the interactions of male, younger and middle age, and total wealth variables with election are all positive and significant (except for male interaction term in Column (2)). Note that since the overall average sensitivity is negative, a positive coefficient indicates a less negative sensitivity of market participation to policy uncertainty.

These results are also economically meaningful. Male household heads respond less negatively to policy uncertainty by 30 basis points. More wealthy households (those with one standard deviation more in logarithm of total wealth) react less negatively to policy uncertainty by 75 basis points and 113 basis points based on Columns (1) and (2), respectively. Finally, compared to the older household heads (those with age of 60 or more), younger household heads aged between 18 and 34 react less negatively to policy uncertainty by 30 and 20 basis points based on Columns (1) and (2), respectively. Analogously, younger household heads aged between 35 and 60 also respond less negatively by 50 and 60 basis points, respectively.

Moving on to the information costs, household heads with financial occupation and more education are less negatively affected by policy uncertainty. This is consistent with the hypothesis that households with lower costs to access and process information are more likely to participate during periods of high policy uncertainty. Household heads with financial occupation react less negatively to policy uncertainty by 60 and 40 basis points based on Column (1) and (2), respectively. Similarly, household heads with some college education respond less negatively by 30 and 10 basis points for Column (1) and (2), respectively. Household heads that possess college

or higher degrees are even less averse to participating in the stock market in response to greater policy uncertainty (by 40 and 30 basis points based on Column (1) and (2), respectively).

Overall, the results in this section are consistent with the hypothesis that households with better capability of dealing with uncertainty (due to either lower risk aversion or greater ability to acquire and process information) are more likely to participate in the stock market even when the policy uncertainty is high. Therefore, this analysis also helps shed some light on the potential mechanisms through which policy uncertainty affects stock market participation.

2.4 Dynamics of stock market participation during an election cycle

Our primary focus so far has been on whether households reduce stock market participation in the period right before a gubernatorial election when policy uncertainty is high. If uncertainty is resolved after the election outcome, we expect the decline in participation to be temporary. In this subsection, we test this possibility, and examine if there is complete or partial reversal in participation after the election. A complete reversal would suggest that there is only an intertemporal substitution of participation when households face uncertainty. In contrast, a partial reversal would indicate that uncertainty has a long-lasting and disruptive effect on participation.

The magnitude of reversal should depend on the degree of resolution in policy uncertainty after the election. For elections where a new governor from a different political party is elected, we expect the policy uncertainty to remain comparatively high. Different parties are likely to have different political ideologies and classes of constituents, which can lead to differences in their stances on policy positions and political actions (Hibbs, 1977; Alesina, 1987; Alesina and Sachs, 1988). For these cases, the reversal could be less compared to the other elections.

Following the methodology in Julio and Yook (2012), we modify the baseline model in equation (1) to examine the dynamics of stock market participation during an election cycle. Specifically, we add a binary variable, *Post-election*, which takes a value of one for years after a gubernatorial election until the year before the next election. To gauge whether party switch has an incremental effect on the post-election participation, we also interact both *Election* and *Post-election* variables with a binary variable, *Party switch*, which takes a value of one for elections where the political party of the elected governor differs from the party of the outgoing governor.

We report the estimation results in Table 7. Columns (1) and (2) show the findings for the propensity of investments in stock market, and Columns (3) and (4) report the results for the intensity of investments in stock market. First, the estimated coefficients on the *Election* dummy are significantly negative in all specifications, confirming our previous finding that participation decreases in the election year. Second, the coefficient estimates on *Post-election* dummy are significantly positive in all specifications, indicating a post-election increase in stock market participation. We examine the effect of party switch in Columns (2) and (4). Two patterns are noteworthy from these specifications. First, in case of no party switch, there is a decrease in participation during the election year (coefficients of –0.007 and –0.004) followed by an increase till the next election (coefficients of 0.006 and 0.003). Second, when there is a party switch, we observe a larger decline in participation during the election year but the increase after the election is smaller. For example, based on the estimates in Column (2), there is a decline of 0.011 (i.e., (–0.007) + (–0.004)) followed by an increase of 0.004 (i.e., 0.006 + (–0.002)).

To evaluate the net effect on stock market participation during the election cycle, we conduct a test on the estimated coefficients on election and post-election variables. The null hypothesis is that the coefficients on the election and post-election variables sum to zero, which would suggest

a complete reversal in participation after the election. We fail to reject this null hypothesis for estimates in Columns (1) and (3), which suggests that the decline in stock market participation completely reverses for the overall sample. In contrast, we reject the null in Columns (2) and (4), which indicates that for elections where there is a party switch, the pre-election decline is greater than the post-election increase in participation, i.e., a net reduction in stock market participation due to lower resolution in policy uncertainty after party switches.

Taken together, these results show that there is a reversal in households' stock market participation after the election. Moreover, the magnitude of reversal depends on the level of resolution in uncertainty after the election. Specifically, when there is a party change after the election, the reversal is less than complete implying a long-lasting and disruptive effect of uncertainty on households' stock market participation.

3. Economic Policy Uncertainty (EPU) index and stock market participation

Although we focus on gubernatorial elections for our main analysis, we provide supplementary evidence using the EPU index developed by Baker, Bloom, and Davis (2016). There are pros and cons of using the EPU index. The advantage lies in the fact that it captures variations in policy uncertainty even during nonelection years and policy uncertainty associated with events/macroeconomic conditions other than gubernatorial elections. However, one limitation is that it may be difficult to disentangle the general economic uncertainty from policy uncertainty when using the EPU index. Therefore, we conduct two sets of analyses, first using panel regressions after explicitly controlling for potential confounding macroeconomic factors, and then using a two-stage least squares (2 SLS) regression with political polarization as an IV as in Gulen and Ion (2016).

3.1 Panel regression

To analyze the effect of policy uncertainty on households' stock market participation, we estimate the following panel regression:

$$StockMktPart_{i,s,t} = \gamma_0 + \gamma_1 EPU_t + \mathbf{X}'_{i,s,t}\gamma_2 + \alpha_i + \varepsilon_{i,s,t} \quad (3)$$

where EPU_t is the EPU index. To match the monthly frequency of the index to our survey data and account for the positive skewness in the index, we use the natural logarithm of the arithmetic average of EPU index over the four-month reference period before which households are interviewed. Since the EPU index are only time varying, we can only control for household fixed effects and exclude year fixed effects in this model. A vector of controls $\mathbf{X}_{i,s,t}$ include the macroeconomic factors, household demographics, and an indicator variable for the presidential elections. Macroeconomic factors include uncertainty related to future equity market returns using the VIX index provided by the Chicago Board Options Exchange (CBOE), uncertainty about future economic growth using the one-year-ahead GDP forecasts from the Philadelphia Federal Reserve's biannual Livingstone survey, investor sentiment using the Investor Sentiment Index from Baker and Wurgler (2007), and equity market performance using the S&P 500 index return. Other variables are as defined earlier in regression in equation (1). Standard errors are double clustered by households and year in estimating equation (3).

Panel A of Table 9 provides results for the stock market participation and Panel B presents the findings for the percentage of liquid wealth invested in the stock market. We find evidence of a strong and negative relation between the EPU index and households' stock market participation. This is consistent with our findings using gubernatorial elections as a measure for policy uncertainty. We continue to observe lower stock market participation by households during periods

of high policy uncertainty. At the mean of the EPU index (107.2), a one standard deviation (39.52) increase in the index is associated with 69 basis points (–0.022 x ln [(107.2 + 39.52) /107.2]) decrease in the probability of households' stock market participation. This implies a 3.1% decrease in the unconditional probability of stock market participation (22.3%). Likewise, at the mean of the EPU index, a one standard deviation increase in the index is associated with 75 basis points decrease in the percentage of liquid wealth invested in the stock market, which corresponds to a 7.2% in the unconditional percentage of investments in the stock market (10.4%).

Since EPU index is a broad measure of policy uncertainty capturing different dimensions of uncertainty, we repeat our analysis for each of the four components of the index instead of the index as the key independent variable to ascertain the component(s) that are significantly associated with households' stock market participation. We find that except for the monetary policy component, all the other three components (news, tax code, and government spending) of the index are significantly and negatively associated with stock market participation.

3.2 Two-stage least squares (2SLS) estimation

To address the possibility that unobservable omitted variables may influence both stock market participation and policy uncertainty, we use a plausibly exogenous instrument for policy uncertainty. For such an instrument to pass the validity criterion, it should have a significant relation with policy uncertainty and should affect households' stock market participation only through this relation. Following Gulen and Ion (2016), we use the level of political polarization in the United States Senate as our instrumental variable. McCarty (2012) argues that partisan polarization "makes is harder to build legislative coalitions, leading to policy gridlock" and to "produce greater variation in policy". Baker et al. (2014) also propose that political polarization could drive policy uncertainty by "producing more extreme policies, less policy stability, and less

capacity of policy makers to address pressing problems." Therefore, we expect that higher levels of political polarization will result in a higher level of policy uncertainty. This helps in the measure of political polarization satisfying the relevance criterion for an IV. At the same time, it is not obvious how the level of disagreement between politicians can directly affect households' stock market participation other than through its effect on policy uncertainty. We therefore believe that our IV also satisfies the exclusion requirement.

Our measure of political polarization is based on the DW-NOMINATE scores of Poole and Rosenthal (1985), which estimate the ideological locations of legislators over time.[9] We focus on the first dimension of the DW-NOMINATE scores, which can be interpreted as the legislators' position on government intervention in the economy (Poole and Rosentahl, 2000). Our IV is calculated as the average of these scores for the Republican party members in the Senate minus the average of the scores for the Democratic party members in the Senate.

In Table 10, we replicate our main results in Table 9 using this political polarization measure as an IV for policy uncertainty, and using a two-stage least squares (2 SLS) framework. In the first stage, we regress the EPU index on the IV and all the controls used in the second-stage regression. In the second stage, we estimate the same regression as in equation (3) using the fitted value from the first-stage regression. Since both the EPU index and the IV only vary over time but not cross-sectionally across households, their values are repeated for all households for a given period. This implies that the usual 2SLS methodology is not appropriate in this context, since it would mechanically overstate the correlation between the endogenous variable and its instrument. To overcome this problem, we bootstrap the standard errors to address the issues associated with using

[9] We obtain the data from https://legacy.voteview.com/dwnomin.htm.

estimated regressors. The *F*-statistic for the first-stage estimation is 12.34, suggesting that the IV satisfies the relevance condition (Stock, Wright, and Yogo, 2002; Angrist and Pischke, 2009). Another test for relevance of instruments is the Anderson-LR test of the null hypothesis that correlations between the instrument and the endogenous variable is essentially zero. We obtain a test statistic value of 67.09 which strongly rejects the null (*p*-value =0.000), implying the instruments are strongly correlated with the endogenous variables. Furthermore, our results show that the relation between policy uncertainty and households' stock market participation remains significantly negative even after addressing the omitted variable issue with an IV.

Collectively, our findings in this section using the EPU index and its components are consistent with those documented earlier using gubernatorial elections. That is, policy uncertainty negatively affects households' stock market participation even when we employ a broader measure of policy uncertainty.

4. Conclusion

In this study, we provide new evidence on the effect of policy uncertainty of households' decision to participate in the stock market. We document three major findings. First, we observe that an increase in policy uncertainty is associated with a significant decline in both the propensity and intensity of households to invest in the stock market. Second, we show that variations in both the participation costs and risk preferences help explain the differential sensitivities of households' stock market participation to policy uncertainty. Specifically, households that possess better ability to acquire and process information, and households with more tolerance to risks associated with policy uncertainty, are less likely to reduce their stock market participation during periods of greater policy uncertainty. Third, we observe that the decline in stock market participation reverses completely when there is resolution in policy uncertainty. For the subsample of elections where

there is a change in the party of elected governor, there is only partial reversal since policy uncertainty is not fully resolved. Therefore, in some instances, there can be long lasting and disruptive effect of policy uncertainty on households' stock market participation. Taken together, our paper has important implications for household welfare through participation in stock markets as well as for deficit units' ability to raise capital through equity markets when there is more uncertainty about economic policy.

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Appendix

This appendix includes the description of the main variables used in the analysis.

Variable Name	Description
Policy uncertainty variables	
Close elections	a binary variable equal to 1 if the vote differential (difference between the percentage of votes obtained by the first and second place candidates) for an election is in the lowest sample tercile of vote differential.
Election	a binary variable equal to 1 if a state in a given year holds a gubernatorial election.
Post election	a binary variable, which takes a value of 1 for years after current gubernatorial election until the next gubernatorial election in a state
Lame duck last term	a binary variable equal to 1 if the incumbent governor is prevented from seeking re-election by term limits.
Party switch	a binary variable equal to 1 if the party of the new governor elected is different from the party of the outgoing one.
Polarization	the DW-NOMINATE scores of McCarty, Poole and Rosenthal (1997) for the Senate
Presidential	a binary variable equal to 1 for years when presidential elections were held.
EPU	policy uncertainty measure from Baker, Bloom, and Davis (2012)
News component	the frequency of articles related to policy uncertainty in ten leading U.S. newspapers
Tax code component	tax code change uncertainty, using data from the Congressional Budget Office
Monetary policy component	monetary policy forecast disagreement, which draws on the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters
Government spending component	fiscal policy forecast disagreement
Household variables	
% Stock share	percentage of liquid wealth invested by the household in stocks and mutual funds in a given year.
College or more	a binary variable equal to 1 if the household head has at least a college degree.
Equity in vehicles	difference between the value and total debt owed against the vehicle.
Equity in other real estate	difference between the value and total other real estate (other than primary residence) debt owed against the estate.
Female	a binary variable equal to 1 if the household head is a female.
Financial occupation	a binary variable equal to 1 for the household head in a finance related occupation.
High school or less	a binary variable equal to 1 if the household head has finished at most high school.
Home equity	difference between the value of the household's property and the value of the household's mortgage.
Labor income	annual and obtained from gross monthly earnings (before deductions), or, for those paid on hourly basis from the regular hourly pay-rate and the number of hours worked.

Liquid wealth	sum of safe assets -- such as government and corporate bonds, money market deposit accounts, checking accounts, and savings accounts -- and stockholdings.
Married	a binary variable equal to 1 if the household head is married.
Middle aged	a binary variable equal to 1 if the household head's age is between 35 and 60.
Old	a binary variable equal to 1 if the household head's age is at or over 60.
Participation	a binary variable equal to 1 if the household holds any stocks in publicly held corporations, or mutual funds in a given year.
Race	a binary variable equal to 1 if the household head is white.
Some college	a binary variable equal to 1 if the household head is a college drop-out.
Total wealth	sum of financial assets, real estates, vehicles, and private business equity.
Young	a binary variable equal to 1 if the household head's age is between 18 and 34.
Macro-level variables	
GDP forecast	one-year-ahead GDP forecasts from the Philadelphia Federal Reserve's biannual Livingston survey
Sentiment	monthly Investor Sentiment Index from Baker and Wurgler (2007).
SP return	S&P 500 index monthly return
State HPI appreciation	percentage change in state's housing price index is the weighted index of single-family house prices obtained from Federal Housing Finance Agency.
State unemployment	state's number of unemployed as a percentage of the labor force.
State GDP growth	annual growth rate in state's GDP
VIX	average monthly implied volatility of S&P 500 index options

Table 1. Summary statistics: SIPP data

The sample includes households in SIPP for the 1996-2000, 2001-2003, 2004-2007, and 2008-2013 waves. All monetary values are in real 1996 dollars. 'Female' is a binary variable equal to 1 if the household head is a female. 'Married' is a binary variable equal to 1 if the household head is married. 'Young' is a binary variable equal to 1 if the household head's age is between 18 and 34 years. 'Middle aged' is a binary variable equal to 1 if the household head's age is between 35 and 60 years. 'Old' is a binary variable equal to 1 if the household head's age is at or over 60 years. 'High school or less' is a binary variable equal to 1 if the household head has finished at most high school. 'Some college' is a binary variable equal to 1 if the household head is a college drop-out. 'College or more' is a binary variable equal to 1 if the household head has at least a college degree. 'Financial occupation' is a binary variable equal to 1 for the household head in finance related occupations. 'Race' is a binary variable equal to 1 if the household head is white. 'Labor income' is annual and obtained from gross monthly earnings (before deductions), or (for those paid on hourly basis) from the regular hourly pay-rate and the number of hours worked. 'Total wealth' includes financial assets as well as all real estate (including second homes), vehicles, and private business equity. 'Liquid wealth' is defined as the sum of safe assets - such as bonds, checking accounts, and savings accounts - and stockholdings. 'Home equity' denotes the difference between the value of the household's property and the value of the household's mortgage. 'Equity in vehicles', 'Equity in other real estate', 'Business equity' are constructed as the difference between the value and total debt owed against the vehicle, other real estate (other than primary residence such as a vacation home or undeveloped lot), and business, respectively.

	No. of Obs.	Mean	Median	Standard deviation
% Households holding stocks	359,260	0.223	0.000	0.416
% Stock share (% of liquid wealth)	359,260	0.104	0.000	0.271
Female	359,260	0.510	1.000	0.499
Married	359,260	0.531	1.000	0.489
Age				
Young	359,260	0.189	0.000	0.391
Middle aged	359,260	0.521	1.000	0.499
Old	359,260	0.290	0.000	0.453
Education				
High school or less	359,260	0.394	0.000	0.493
Some college	359,260	0.312	0.000	0.468
College or more	359,260	0.283	0.000	0.456
Financial occupation	359,260	0.041	0.000	0.198
Race (=white)	359,260	0.822	1.000	0.382
Labor income	359,260	44,532	30,156	88,841
Total wealth	359,260	189,079	66,197	694,331
Liquid wealth	359,260	32,173	1,500	824,300
Home equity	359,260	57,025	17,000	102,754
Equity in other real estate	359,260	15,289	0.000	77,292
Business equity	359,260	13,239	0.000	108,762
Equity in vehicles	359,260	5,874	3,769	9,134

Table 2. Summary statistics: Gubernatorial elections

This table reports summary statistics for gubernatorial elections held between 1996 and 2013 in 46 U.S. states. 'Lame duck last term' is a binary variable equal to 1 if the incumbent governor is prevented from seeking re-election by term limits. 'Party switch' is a binary variable equal to 1 if the party of the new governor elected is different from the party of the previous one. 'Mid-year governor change' is a binary variable equal to 1 if there is a non-standard mid-year change in governors. Non-standard means because of death, resignation, or impeachment. 'Close election' is a binary variable equal to 1 if the vote differential (difference between the percentage of votes obtained by the first and second place candidates) for an election is in the lowest sample tercile of vote differential.

	No. of Obs.	Mean	Median	Standard deviation
Whole sample				
Gubernatorial elections (%)	828	24.77	0.00	43.19
Mid-year governor change (%)	828	2.06	0.00	14.29
Governor switch (%)	828	17.11	0.00	37.36
Lame duck last term (%)	828	32.08	0.00	43.30
Election =1				
Incumbent Republican (%)	201	51.87	1.00	50.06
Incumbent Democrat (%)	201	46.13	0.00	49.91
Incumbent Other (%)	201	2.00	0.00	14.80
Victory margin (%)	201	16.33	12.71	13.79
Close election victory margin (%)	69	3.73	0.00	2.123
Party switch (%)	201	32.82	0.00	28.33
Lame duck last term (%)	201	27.80	0.00	44.52

Table 3. Policy uncertainty, household stock market participation and portfolio allocation

This table relates the gubernatorial elections to household stock market participation (columns 1 & 2) and portfolio allocation (columns 3 & 4). 'Participation' is an indicator variable equal to 1 if the household holds any stocks in publicly held corporations or mutual funds in a given year. '% Stock share' is the percentage of liquid wealth invested by the household in stocks and mutual funds in a given year. 'Election' is an indicator variable takes on a value of one if a gubernatorial election occurred in a given state and year. Omitted category in age is 'Old'. Omitted category for education is 'High school or less'. 'Total wealth' and 'Labor income' are in log-units. Other variables are as defined in the Appendix. All specifications include fixed effects as indicated in the table. Standard errors are clustered by states. *t*-statistics are reported in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

	(1)	(2)	(3)	(4)
	Participation		% Stock share	
Election	-0.009**	-0.007**	-0.006***	-0.006***
	(-2.515)	(-1.995)	(-3.920)	(-2.864)
Married	0.029***	0.028***	0.021***	0.021***
	(7.026)	(6.795)	(6.436)	(6.538)
College or more	0.034***	0.035***	0.020***	0.019***
	(4.026)	(4.187)	(3.036)	(2.918)
Some college	0.012**	0.012**	0.005	0.005
	(2.066)	(2.107)	(1.157)	(1.066)
Young	0.010*	0.008*	0.007*	0.004
	(1.842)	(1.706)	(1.905)	(1.030)
Middle aged	0.017***	0.011**	0.007*	0.010**
	(3.481)	(2.286)	(1.697)	(2.167)
Total wealth	0.004***	0.004***	0.004***	0.004***
	(24.90)	(25.03)	(27.26)	(26.94)
Labor income	0.002***	0.001***	0.002***	0.002***
	(13.01)	(12.27)	(13.41)	(11.85)
State GDP growth	0.499***	0.494***	-0.038	-0.036
	(4.021)	(3.653)	(-0.793)	(-0.835)
State unemployment	-0.311*	-0.153	-0.286***	-0.141**
	(-1.937)	(-1.536)	(-4.093)	(-2.460)
State HPI appreciation	0.032**	0.008*	0.175***	0.120***
	(2.082)	(1.776)	(19.18)	(10.36)
Presidential	-0.003**		-0.016***	
	(-2.183)		(-3.062)	
Nobs	306,648	306,648	306,648	306,648
R-squared	0.842	0.842	0.731	0.731
State fixed effects	yes	yes	yes	yes
Year fixed effects	no	yes	no	yes
Household fixed effects	yes	yes	yes	yes

Table 4. Degree of policy uncertainty, household stock market participation and portfolio allocation

This table examines whether the degree of electoral uncertainty amplifies the effect of policy uncertainty on households' stock market participation (columns 1 & 2) and portfolio allocation (columns 3 & 4). 'Participation' is an indicator variable equal to 1 if the household holds any stocks in publicly held corporations or mutual funds in a given year. '% Stock share' is the percentage of liquid wealth invested by the household in stocks and mutual funds in a given year. Other variables are as defined in the Appendix. All specifications include fixed effects as indicated in the table. *t*-statistics are reported in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

	(1)	(2)	(3)	(4)
	Participation		% Stock share	
Election	-0.007**	-0.005*	-0.005**	-0.004**
	(-2.188)	(-1.906)	(-2.483)	(-1.993)
Close election	-0.016***	-0.017***	-0.009***	-0.009***
	(-4.992)	(-3.782)	(-5.716)	(-4.357)
Nobs	306,648	306,648	306,648	306,648
R-squared	0.842	0.842	0.731	0.731
State fixed effects	yes	yes	yes	yes
Year fixed effects	no	yes	no	yes
Household fixed effects	yes	yes	yes	yes
Other controls	As in Table 3 Col. 1	As in Table 3 Col. 2	As in Table 3 Col. 3	As in Table 3 Col. 4

Table 5. Term limits, household stock market participation and portfolio allocation

Dependent variable is households' stock market participation (columns 1 & 2) and portfolio allocation (columns 3 & 4). 'Participation' is an indicator variable equal to 1 if the household holds any stocks in publicly held corporations or mutual funds in a given year. '% Stock share' is the percentage of liquid wealth invested by the household in stocks and mutual funds in a given year. Other variables are as defined in Tables 1, 2 and 3. All specifications include fixed effects as indicated in the table. *t*-statistics are reported in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

	(1)	(2)	(3)	(4)
	Participation		% Stock share	
Election	-0.006*	-0.005*	-0.004***	-0.002**
	(-1.912)	(-1.803)	(-3.837)	(-2.027)
Lame duck last term	-0.002	-0.003	-0.003	-0.003
	(-1.558)	(-1.230)	(-1.625)	(-1.498)
Election × Lame duck last term	-0.011***	-0.011***	-0.009***	-0.008***
	(-5.756)	(-4.867)	(-7.634)	(-6.305)
Nobs	306,648	306,648	306,648	306,648
R-squared	0.842	0.842	0.731	0.731
State fixed effects	yes	yes	yes	yes
Year fixed effects	no	yes	no	yes
Household fixed effects	yes	yes	yes	yes
Other controls	As in Table 3 Col. 1	As in Table 3 Col. 2	As in Table 3 Col. 3	As in Table 3 Col. 4

Table 6. Cross sectional differences in the effect of policy uncertainty on stock market participation

This table explores cross-sectional differences in the effect of policy uncertainty on stock market participation and portfolio decision of households. 'Participation' is an indicator variable equal to 1 if the household holds any stocks in publicly held corporations or mutual funds in a given year. '% Stock share' is the percentage of liquid wealth invested by the household in stocks and mutual funds in a given year. 'Total wealth' and 'Labor income' are in log-units. Other variables are as defined in the Appendix. All regressions include the same controls as in Table 3 (Columns 2 and 4), and fixed effects as indicated in the table. The coefficients on 'State GDP growth', 'State unemployment', and 'State HPI' are subsumed by the state-year fixed effects. *t*-values are presented in parentheses. Standard errors clustered at the state level. ***, **, and are* denote significance at 1%, 5%, and 10% levels, respectively.

	(1)	(2)
	Participation	% Stock share
Male × Election	0.003*	0.001
	(1.708)	(0.886)
Race × Election	-0.000	-0.001
	(-0.937)	(-1.126)
Financial occupation × Election	0.006**	0.004**
	(2.405)	(1.993)
Married × Election	-0.001	0.001
	(-1.539)	(1.094)
College or more × Election	0.004***	0.003***
	(3.129)	(2.820)
Some college × Election	0.003**	0.001*
	(2.372)	(1.976)
Young × Election	0.003*	0.002**
	(1.895)	(2.148)
Middle aged × Election	0.005*	0.006*
	(1.654)	(1.822)
Total wealth × Election	0.002***	0.003***
	(3.585)	(4.071)
Labor income × Election	-0.000	0.000
	(-1.033)	(1.378)
Nobs	306,648	306,648
R-squared	0.842	0.731
Household fixed effects	Yes	yes
State-year fixed effects	Yes	yes
Other controls	As in Table 3 Col. 2	As in Table 3 Col. 4

Table 7. Dynamics of stock market participation during an election cycle

This table provides evidence on the evolution of stock market participation and portfolio allocation over the full gubernatorial election cycle. The dependent variables are 'Participant' (columns 1 and 2) and '% Stock share' (columns 3 and 4). 'Election' is a binary variable equal to 1 if a gubernatorial election occurred in that state in that year. 'Post-election' is a binary variable, which takes a value of 1 for years after current gubernatorial election until the next gubernatorial election in a state. 'Party switch' is a binary variable equal to 1 for gubernatorial elections, where the elected governor is from a different political party compared to the party of the outgoing governor. Other unreported controls are defined in the Appendix. All specifications include fixed effects as indicated in the table. Clustered *t*-values are presented in parentheses. Bottom panel provides tests for the null hypothesis that the coefficients of election and post-election variables sum to zero. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Participation	Participation	% Stock share	% Stock share
Election	-0.007***	-0.007***	-0.005***	-0.004**
	(-3.626)	(-3.445)	(-2.769)	(-2.402)
Post-election	0.005**	0.006***	0.003**	0.003**
	(2.489)	(2.736)	(2.121)	(2.039)
Election × Party switch		-0.004**		-0.006***
		(-2.183)		(-2.753)
Post-election × Party switch		-0.002		-0.001
		(-1.616)		(-1.527)
Test for linear combinations of coefficients:				
Election + Post-election variables	-0.002	-0.007***	-0.002	-0.008***
Nobs	306,648	306,648	306,648	306,648
R-squared	0.842	0.842	0.731	0.731
State fixed effects	yes	yes	yes	yes
Year fixed effects	yes	yes	yes	yes
Household fixed effects	yes	yes	yes	yes
Other controls	As in Table 3 Col. 2	As in Table 3 Col. 2	As in Table 3 Col. 4	As in Table 3 Col. 4

Table 8. Policy Uncertainty Index and Macroeconomic variables

This table summarizes the economic policy uncertainty (EPU) index, its four components, and macro variables in our sample. Expected GDP growth, 'GDP forecast', is the one-year-ahead GDP forecasts from the Philadelphia Federal Reserve's biannual Livingston survey, 'VIX' is the average monthly implied volatility of S&P 500 index options. 'Sentiment' is monthly Investor Sentiment Index from Baker and Wurgler (2007). 'SP return' is the S&P 500 index monthly return.

Panel A: Summary statistics

	Mean	P10	Median	P90	Standard deviation
EPU index	107.20	64.39	93.61	158.00	39.52
News component	112.13	65.33	104.30	169.00	47.35
Tax component	381.22	16.79	123.22	1310.2	483.94
Government spending component	80.31	49.78	69.14	134.00	32.22
CPI component	88.77	68.01	81.61	125.10	24.93
VIX	23.32	13.34	24.14	32.64	7.87
Sentiment	0.19	-0.70	0.14	0.86	0.75
GDP forecast	4.88	4.31	4.55	5.62	0.52
SP return	0.12	-0.13	0.13	0.27	0.15

Panel B: Correlation matrix (*p*-values in parentheses)

	EPU index	VIX	Sentiment	GDP forecast	SP return
EPU index	1.000				
VIX	0.442 (0.000)	1.000			
GDP forecast	-0.347 (0.000)	-0.341 (0.000)	1.000		
Sentiment	-0.221 (0.000)	0.008 (0.000)	-0.037 (0.000)	1.000	
SP return	-0.236 (0.000)	-0.046 (0.000)	-0.410 (0.000)	-0.297 (0.000)	1.000

Table 9. Economic policy uncertainty and Household stock market participation

This table relates the economic policy uncertainty and its components (in log-units) to household stock market participation. Panel A is for extensive margin (*Participation*) and Panel B is for intensive margin (*% Stock Share*). Omitted category in age is 'Old' and omitted category for education is 'High school or less'. 'Total wealth' and 'Labor income' are in log-units. Other variables are defined as in the Appendix. All specifications include household fixed effects. Standard errors are double clustered by households and year. *t*-statistics are reported in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

Panel A. Extensive margin (*Participation*)

	(1)	(2)	(3)	(4)	(5)
EPU index	-0.022***				
	(-4.359)				
News component		-0.020***			
		(-3.994)			
Tax code component			-0.010***		
			(-6.374)		
Government spending component				-0.018**	
				(-2.206)	
Monetary policy component					0.007
					(1.099)
Married	0.028***	0.028***	0.028***	0.028***	0.029***
	(6.825)	(6.826)	(6.708)	(6.780)	(6.875)
College or more	0.032***	0.032***	0.033***	0.033***	0.032***
	(3.778)	(3.782)	(3.882)	(3.814)	(3.780)
Some college	0.012*	0.012*	0.012*	0.012*	0.012**
	(1.908)	(1.927)	(1.911)	(1.939)	(2.002)
Young	0.005	0.009	0.003	0.007	0.010
	(1.457)	(1.380)	(0.483)	(1.054)	(1.459)
Middle aged	0.015***	0.015***	0.012**	0.014***	0.016***
	(3.172)	(3.094)	(2.545)	(2.941)	(3.166)
Total wealth	0.004***	0.004***	0.004***	0.004***	0.004***
	(14.91)	(14.95)	(14.77)	(14.96)	(14.98)
Labor income	0.001***	0.001***	0.001***	0.001***	0.001***
	(3.010)	(3.000)	(2.844)	(2.950)	(2.992)
Presidential	-0.004**	-0.002	-0.004***	-0.005***	-0.002
	(-2.501)	(-1.134)	(-2.660)	(-2.896)	(-0.899)
VIX	-0.009***	-0.008***	-0.009***	-0.007***	-0.007**
	(-3.491)	(-3.788)	(-4.757)	(-2.773)	(-2.523)
Sentiment	0.008***	0.008***	0.005***	0.011***	0.008***
	(7.484)	(7.453)	(4.406)	(5.749)	(6.543)
GDP forecast	0.014***	0.014***	0.014***	0.019***	0.016***
	(4.029)	(3.870)	(5.632)	(4.559)	(4.201)
SP return	0.010*	0.009	0.034***	0.013*	0.013*
	(1.793)	(1.319)	(5.016)	(1.868)	(1.669)
Nobs	310,816	310,816	310,816	310,816	310,816
R-squared	0.829	0.829	0.829	0.829	0.829
Household fixed effects	yes	yes	yes	yes	yes

Table 9. Economic policy uncertainty and portfolio choice (continued)

Panel B. Intensive margin (% Stock share)

	(1)	(2)	(3)	(4)	(5)
EPU index	-0.024***				
	(-3.682)				
News component		-0.019***			
		(-2.673)			
Tax code component			-0.011***		
			(-4.355)		
Government spending component				-0.016***	
				(-2.581)	
Monetary policy component					0.007
					(1.483)
Married	0.021***	0.021***	0.022***	0.021***	0.021***
	(5.913)	(5.916)	(6.011)	(5.839)	(5.924)
College or more	0.019***	0.018***	0.017***	0.018***	0.018***
	(2.672)	(2.686)	(2.591)	(2.756)	(2.719)
Some college	0.005	0.005	0.005	0.005	0.005
	(1.317)	(1.316)	(1.295)	(1.336)	(1.335)
Young	0.008	0.007	0.013*	0.005	0.007
	(1.449)	(1.302)	(1.911)	(0.978)	(1.282)
Middle aged	0.012***	0.011***	0.014***	0.010***	0.011***
	(2.915)	(2.808)	(3.728)	(2.659)	(2.858)
Total wealth	0.004***	0.004***	0.004***	0.004***	0.004***
	(15.84)	(15.96)	(16.05)	(16.01)	(16.09)
Labor income	0.000	0.001	0.001*	0.001	0.001
	(1.544)	(1.530)	(1.685)	(1.483)	(1.514)
Presidential	0.003**	-0.002*	-0.003*	-0.002**	-0.001
	(-1.992)	(-1.734)	(-1.908)	(-1.823)	(-1.459)
VIX	-0.003***	-0.004***	-0.007***	-0.001*	-0.001**
	(-3.407)	(-3.540)	(-2.937)	(-1.878)	(-2.087)
Sentiment	0.005***	0.005***	0.005***	0.003**	0.005***
	(4.862)	(4.847)	(3.953)	(2.355)	(4.494)
GDP forecast	0.018**	0.017**	0.040***	0.019***	0.024***
	(2.475)	(2.334)	(5.749)	(2.856)	(3.894)
SP return	0.003	0.004	0.017**	0.000	0.001
	(0.407)	(0.540)	(2.937)	(0.078)	(0.087)
Nobs	310,816	310,816	310,816	310,816	310,816
R-squared	0.729	0.729	0.729	0.729	0.729
Household fixed effects	yes	yes	yes	yes	yes

Table 10. Two stage least square estimation of economic policy uncertainty

We present two-stage least-squares results using the DW-NOMINATE (polarization) scores of McCarty, Poole and Rosenthal (1997) for the Senate as instrument for the policy uncertainty index. Both 'EPU index' and 'Polarization' are in log-units. Dependent variables are stock market participation ('Participation') in column 1 and the stock share of liquid wealth ('% Stock share') in column 2. The first stage *F*-statistic as well as Anderson *LR* test of the null hypothesis that our instrument and endogenous variable are not correlated are also reported. 'Total wealth' and 'Labor income' are in log-units. Omitted category in age is 'Old'. Omitted category for education is 'High school or less'. Other variables are as defined in the Appendix. First stage estimates also include the control variables that are used in the second stage. Standard errors are double clustered by households and year-month, and bootstrapped to account for the fact that the EPU index regressor is estimated. *t*-statistics are reported in parentheses, where *** indicates significance at the 1% level, ** at the 5% level, and * at the 10% level.

	(1) Participation	(2) % Stock share
EPU index (Instrument=Polarization)	-0.017***	-0.019**
	(-2.552)	(-1.997)
Married	0.028***	0.023***
	(5.742)	(3.745)
College or more	0.035***	0.021***
	(4.531)	(3.342)
Some college	0.012*	0.006
	(1.918)	(1.558)
Young	0.001	0.005
	(0.214)	(0.815)
Middle aged	0.012***	0.012**
	(2.847)	(2.277)
Total wealth	0.004***	0.004***
	(8.539)	(9.614)
Labor income	0.002*	0.001
	(1.842)	(1.525)
VIX	-0.011**	-0.003**
	(-2.213)	(-2.129)
Sentiment	0.006**	0.007
	(3.078)	(0.276)
GDP forecast	0.003	0.057
	(0.200)	(0.817)
SP return	-0.008	0.074
	(-0.744)	(1.347)
Nobs	310,816	310,816
Household fixed effects	yes	yes
1st stage diagnostics		
Anderson-Rubin (AR) Wald test	67.09	
AR Wald test *p*-value	0.000	
F-statistics	12.34	