

CEAR-RSI Household Finance Workshop

Policy Uncertainty and Household Stock Market Participation

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Anecdotal evidence on PU and SMP



- ◆ CBS News, October 13, 2016, “Clinton or Trump? Nervous U.S. investors await answer”
 - “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.



Research questions



- ◆ Does policy uncertainty (PU) affect the propensity and intensity of households' SMP?
- ◆ If so, where do households reallocate their capital?
- ◆ What are the potential channels through which policy uncertainty affects SMP?
- ◆ Does SMP reverse after PU resolves? If so, does it reverse completely or partially?



What does PU seek to capture?



- ◆ Uncertainty about *who* will make policy decisions (e.g., who will win the next elections)
- ◆ Uncertainty about *what* economic policy actions the decision makers will undertake, and *when*
- ◆ Uncertainty about the economic *effects* of policy actions (consequences of past, present, and future actions)
- ◆ Uncertainty induced by policy *inaction* (policy delays)



Measuring PU



Elections (the main measure):

- ❖ Pre-determined /exogenous dates
- ❖ But it is a discrete event (once in 4 years) - there is a lot of uncertainty you want to pick up in between them

EPU (results hold):

- ❖ Captures the variation in policy-related uncertainty in non-election years
- ❖ But only time-varying, difficult to difference out other unobserved aggregate shocks



Measuring PU (contd.)



State-level vs. National elections:

- ❖ Unlike presidential elections, gubernatorial elections are staggered
- ❖ Households located in different states share the same *national* political and business cycles, and therefore face similar macroeconomic uncertainty at the aggregate level
- ❖ Governors have the chief authority over a state, with the ability in shaping local economic environment such as taxes, subsidies, healthcare, state budget, minimum wages (Peltzman, 1987; Besley and Case, 1995)



◆ Household data:

- Survey of Income and Program Participation (SIPP) data of the US Census Bureau

◆ Gubernatorial election data:

- Correlates of State Policy Project initiated by the Institute for Public Policy and Social Research (IPPSR)

◆ State unemployment:

- Bureau of Labor Statistics (BLS)

◆ State Housing price index:

- Federal Housing Finance Agency

◆ State GDP growth:

- Bureau of Economic Analysis (BEA)

- ◆ Survey follows new sets of households up to four years
- ◆ Core set of questions (answers reported every four months):
 - demographics, employment and income, and business ownership
- ◆ Topical modules (answers reported annually):
 - assets and liabilities
 - ownership and market value of different types of assets, including real estate, vehicles, financial assets
- ◆ Our sample includes all household heads with age +18
- ◆ 1996, 2001, 2004 and 2008 panels covering 1996-2000, 2001-2003, 2004-2007, and 2008-2013 waves

Summary Statistics: SIPP

152,095 households in the sample

Variables	No. of Obs.	Mean	Median	Std. dev.
% Households holding stocks	359,260	0.223	0.000	0.416
% Households holding stocks (inc. retirement accounts)	359,260	0.387	0.000	0.450
% Stock share (% of liquid wealth)	359,260	0.104	0.000	0.271

- ◆ Our analysis focus on stock investments outside of retirement accounts for several reasons
 - Households do not actively rebalance or trade in their retirement accounts (Agnew, Balduzzi, and Sunden, 2003; Mitchell et al., 2006; Benartzi and Thaler, 2007)
 - Withdrawals often incur significant penalties
 - Default choices affect investments in the retirement accounts (Beshears et al., 2009)
 - SIPP data does not contain information on asset allocations within retirement accounts



Gubernatorial elections data from IPPSR



◆ Elections:

- pre-scheduled and staggered across states and years held every four years, with the exception of Vermont and New Hampshire, which choose to run their gubernatorial elections every two years
 - 36 states are subject to various term limits
-
- ◆ We exclude North Dakota, South Dakota, Maine, and Vermont because the SIPP mask these small states to protect confidentiality of respondents (merge Dakotas together and Maine and Vermont together)

Summary Statistics: IPPSR



	Obs.	Mean
Whole sample		
Gubernatorial elections (%)	736	25.81
Governor switch (%)	736	17.11
Election =1		
Incumbent Republican (%)	190	51.87
Incumbent Democrat (%)	190	46.13
Incumbent Other (%)	190	2.000
Victory margin (%)	190	16.46
Close election victory margin (%)	63	3.84
Party switch (%)	190	32.82
Lame duck last term (%)	190	27.80

Gubernatorial elections and SMP

Baseline model (Difference-in-differences)

$$\text{StockMktPart}_{i,s,t} = \beta_0 + \beta_1 \text{Election}_{s,t} + \mathbf{X}'_{i,s,t} \beta_2 + \delta_s + \mu_t + \alpha_i + \varepsilon_{i,s,t}$$

- ◆ Households in states without an upcoming election in a given year t is the control group for a treated sample of households in states about to elect a governor during the same year t
- ◆ Controls
 - household variables (financial wealth, total wealth, age, education level, marital status, financial occupation, race, and gender), and
 - state-level variables (GDP growth, unemployment rate, and housing price index (HPI))
 - Fixed effects (state, year, household)
- ◆ Standard errors are clustered at state and year levels to account for the correlations in households' decisions to participate in the stock market from the same state and for the correlations in the same year.

Gubernatorial elections and SMP

Results of the baseline model

	Participation		% Stock share	
Election	-0.008**	-0.007*	-0.005***	-0.006**
	(-2.216)	(-1.875)	(-2.794)	(-1.980)
Presidential	-0.003*		-0.017***	
	(-1.792)		(-2.928)	
Nobs	306,648	306,648	306,648	306,648
State fixed effects	yes	yes	yes	yes
Year fixed effects	no	yes	no	yes
Household fixed effects	yes	yes	yes	yes

- ◆ Policy uncertainty negatively and significantly affects households' stock market participation
- ◆ -0.008 and -0.007 imply a decrease of 3.1% and 3.5% in the average probability of stock market participation (22.3%)
- ◆ -0.005 and -0.006 imply a 4.8% to 5.8% decrease in the average % of liquid wealth invested in the stock market (10.4%)



Elections associated with greater uncertainty



- ◆ Greater policy uncertainty should have stronger effects on households' SMP

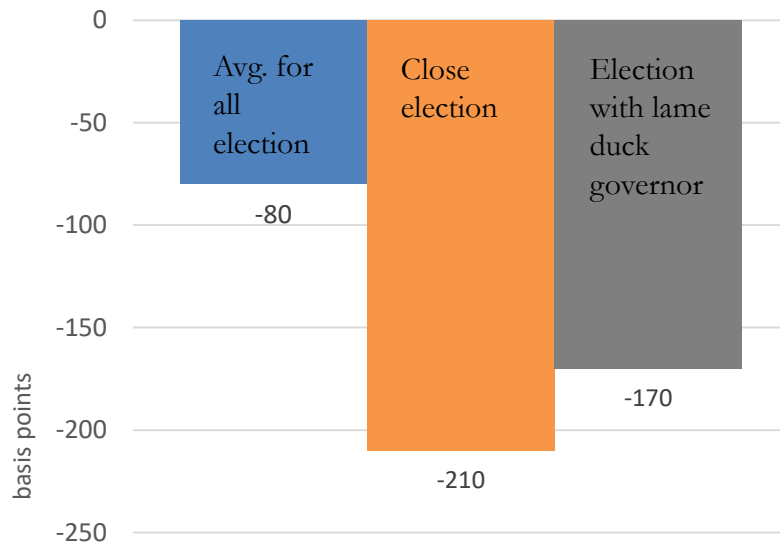
- ◆ Two proxies:
 - **Close elections:** victory margin in the lowest tercile (avg. 3.84% vs. 22.59% for non-close elections). Robustness: ex-ante measure of closeness constructed with pre-election poll data.

 - **Elections where incumbent governors cannot stand for reelections due to term limits:** Due to incumbency advantage, incumbents overwhelmingly win reelections. (83% of time in our sample). PU can exacerbate when the incumbent is in his/her last term. Term limits are also plausibly exogenous.

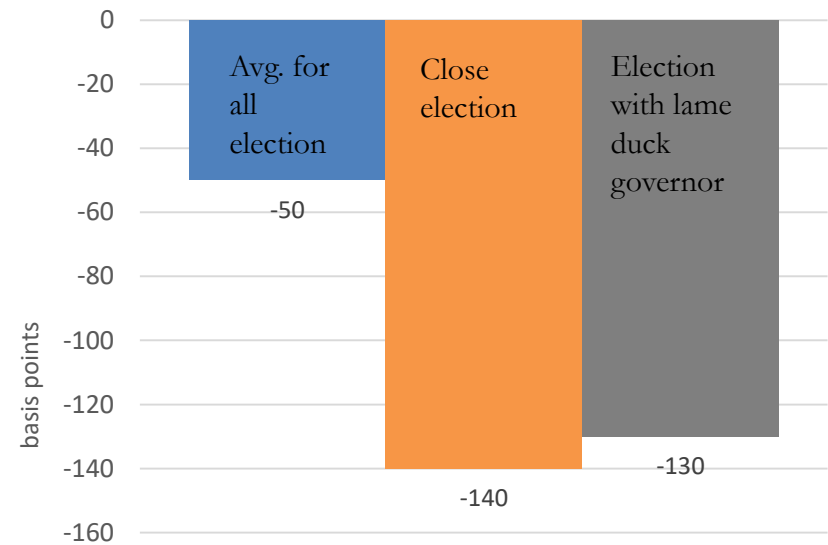
Elections associated with greater uncertainty: results



Reduction in Participation



Reduction in % Stock share



Effects are stronger for elections with greater uncertainty.



Brokerage data



- ◆ Prior research has shown that policy uncertainty can influence the real behavior of local firms
- ◆ Such changes can consequently impact the value of local equity holdings of households
- ◆ One may attribute our findings so far to such spillover (**indirect**) effects of policy uncertainty on households through local firms, rather than its **direct** effects on the households due to the policy changes related to issues such as minimum wages, subsidies, and taxation



Brokerage data



- ◆ Data on households' equity holdings from a large discount brokerage firm for the period 1991 to 1996
- ◆ These data provide monthly information on common stock holdings for a large panel of households residing in different states
- ◆ Examine the investment behavior of households in their in-state and out-of-state stocks around elections
- ◆ Identify direct and spillover channels

Brokerage data

	(1)	(2)
	In-state investment	Out-of-state investment
Election	-0.132** (-3.497)	-0.040* (-1.817)
State GDP growth	0.014 (1.021)	-0.003 (-0.427)
State unemployment	-0.002 (-0.038)	-0.005 (-0.187)
State HPI appreciation	-0.001 (-0.084)	0.004 (0.632)
Household fixed effects	Yes	Yes
Year fixed effects	Yes	Yes

A simultaneous decrease in non-local equity holdings of households prior to elections suggests that spillover effects of policy uncertainty cannot be the sole driver of our findings, and that there exists a direct effect on households that can be potentially explained by the differences in their¹⁸ characteristics

How do households reallocate their assets?

	% Stock share ^W		% Safe share ^W		% Non-liquid ^W	
Election	-0.001**	-0.001**	0.012**	0.010*	-0.009	-0.012
	(-2.078)	(-2.369)	(2.247)	(1.809)	(-0.988)	(-1.035)
Nobs	306,648	306,648	306,648	306,648	306,648	306,648
State fixed effects	yes	yes	yes	yes	yes	yes
Year fixed effects	no	yes	no	yes	no	yes
Household fixed effects	yes	yes	yes	yes	yes	yes

- ◆ These three variables are scaled by total wealth to 1) control for any shocks to other parts of the households' portfolio, and 2) to avoid the mechanical relation that a decrease in the % of liquid wealth invested in stocks always indicates an increase in the % of liquid wealth invested in safe assets.
- ◆ Households dampen their stock investments by 4.4% (at the mean of 2.7%), while boosting their investments in relatively safer assets by 5.7% (at the mean of 19.1%).



Within-state cross-sectional differences in households' sensitivities to policy uncertainty



- ◆ Households' capability of dealing with policy uncertainty varies, which in turn affects the sensitivity of their participation to policy uncertainty. Specifically, we consider the following two aspects:
 - Participation costs of acquiring and processing information:
 - Education should help in overcome the barriers to holding stocks due to ignorance and misperceptions
 - Financial occupation should reflect both a higher level of financial literacy and easier access to information
 - Tolerance to risks:
 - Men are generally perceived to be less risk averse than women
 - Wealthy households generally exhibit greater propensity to take risk in their portfolios
 - Older investors have shorter investment horizons and have less human wealth relative to financial wealth, which should be associated with a negative age effect on SMP



Within-state cross-sectional differences in households' sensitivities to policy uncertainty (contd.)



- ◆ Households' exposure to employment risk with policy uncertainty varies, which can also affect the sensitivity of their participation to policy uncertainty.
 - Cahan (2017) finds that governors and their allies may have the ability to raise employment levels leading up to elections, or delay employment-reducing decisions until afterwards.
 - Households who are self-employed in politically sensitive industries (transportation, warehousing, utilities, public administration, educational, health and social services, and mining) are more susceptible to changes in political landscape than others (Kostovetsky, 2015).

Within-state cross-sectional differences in households' sensitivities to policy uncertainty (contd.)

Model

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

- ◆ Coefficients of interest are the interaction terms
- ◆ Include state×year fixed effects to control for any time-varying state conditions
- ◆ Identify variations in stock market participation across households residing in the same state at the same point in time
- ◆ Election itself is absorbed by the state×year fixed effect

Within-state cross-sectional differences in households' sensitivities to policy uncertainty (contd.)

		Participation	% Stock share
Information costs	College or more × Election	0.004 ^{***}	0.003 ^{***}
	Some college × Election	0.003 ^{**}	0.001 [*]
	Financial occupation × Election	0.006 ^{**}	0.004 [*]
Risk preferences	Male × Election	0.003 [*]	0.001
	Total wealth × Election	0.002 ^{***}	0.003 ^{***}
	Young × Election	0.003 [*]	0.002 ^{**}
	Middle aged × Election	0.005	0.006 [*]
Employment risk	Government employee x Election	-0.004 ^{***}	-0.003 ^{***}
	Business owner in PSI x Election	-0.003 [*]	0.002
	Nobs	306,648	306,648
	Household fixed effects	yes	yes
	State-year fixed effects	yes	yes

Households with better capability of dealing with uncertainty are more likely to participate in the stock market when the policy uncertainty is high.

Households with higher exposure to employment risk are less likely to participate.



Dynamics of SMP during an election cycle



- ◆ If uncertainty is resolved after the election outcome, we expect the decline in participation to be temporary
- ◆ A complete reversal would suggest that there is only an intertemporal substitution of participation when households face uncertainty
- ◆ A partial reversal would indicate that uncertainty has a long-lasting and disruptive effect on participation



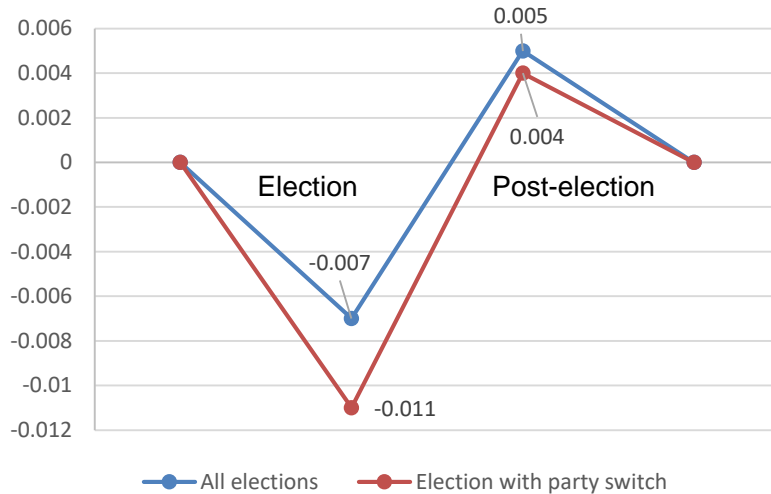
- ◆ Magnitude of reversal should depend on the degree of resolution in policy uncertainty after the election

- ◆ 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).

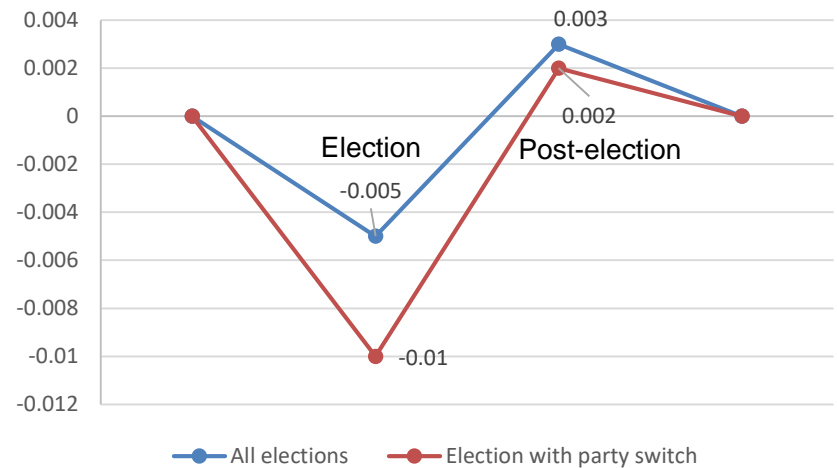
Dynamics of SMP during an election cycle: results



Participation



% Stock share



Participation:	Participation:
All elections	Party switch
-0.002	-0.007***

%Stock share:	%Stock share:
All elections	party switch
-0.002	-0.008***



Analysis using another proxy: EPU index

- ◆ Economic Policy Uncertainty (EPU) index developed by Baker, Bloom, and Davis (2016)
 - Captures a broader level of policy uncertainty attributed to the political and regulatory system
 - Provides variation in policy uncertainty for nonelection years
 - However, only time-varying, making it challenging 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
 - Data obtained from <http://www.policyuncertainty.com/>.



The EPU index and SMP



Baseline model

$$\text{StockMktPart}_{i,s,t} = \gamma_0 + \gamma_1 \text{EPU}_t + \mathbf{X}'_{i,s,t} \gamma_2 + \alpha_i + \varepsilon_{i,s,t}$$

- Take the natural logarithm of the EPU index as of the last day of the reference period, the month before the interview
- Year fixed effects are excluded since the index is time-varying
- Control for potential confounding macroeconomic factors (VIX, one-year-ahead GDP forecasts, investor sentiment, S&P 500 returns)
- Standard errors are double clustered by households and year-month

The EPU index and SMP: Results

	Participation	% Stock share
EPU index	-0.021*** (-4.183)	-0.025*** (-3.279)
Nobs	310,816	310,816
Household fixed effects	yes	yes

- Strongly negative relation between the EPU index and SMP
- At the mean of the EPU index (107.2), a one SD (39.52) increase in the index → 3.0% decrease in the average probability of SMP → 7.5% in the average % of investments in the stock market
- 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 SMP



IV estimation

- ◆ **IV analysis** to address the possibility that some omitted variables may influence both SMP and policy uncertainty
- ◆ Following Gulen and Ion (2016), use the level of political polarization in the U.S. Senate as the IV

- *Relevance:*

Partisan polarization “makes it harder to build legislative coalitions, leading to policy gridlock” and to “produce greater variation in policy”

McCarty (2012)

Political polarization could drive policy uncertainty by “producing more extreme policies, less policy stability, and less capacity of policy makers to address pressing problems”.

Baker et al. (2014)

- *Exclusion:* Not obvious how the level of disagreement between politicians can directly affect households’ SMP other than through its effect on policy uncertainty

Results: IV analysis

	Participation	% Stock share
EPU index (Instrument = Polarization)	-0.017*** (-2.465)	-0.018** (-1.979)
Nobs	310,816	310,816
Household fixed effects	yes	yes

- Relation between policy uncertainty and households' SMP remains significantly negative after addressing the omitted variable issue with an IV
- Two relevance tests show a strong relation between the instrument and the endogenous variable: F -statistics of 14.28 > 10; Anderson-LR test statistics of 72.17 with a p -value of 0.000



Conclusions and implications



◆ Provide new evidence on the effect of policy uncertainty on households' decision to participation in the stock market

- 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
- Households reallocate their capital to safer assets
- Variations in participation costs, risk preferences, and exposures to employment risk help explain the differential sensitivities of households' stock market participation to policy uncertainty
- Reversal in households' stock market participation after the election - magnitude of reversal depends on the level of uncertainty after the election
 - In case of a party change, reversal is less than complete implying a long-lasting and disruptive effect of uncertainty on participation



Conclusions and implications (contd.)



◆ Important implications for households, firms, and economy in general:

- Since the equity risk premium is positive, lack of participation in the stock market can have significant negative effects on households' wealth accumulation and retirement savings
- If the demand for stocks is lower during periods of high uncertainty, it can raise the costs of raising capital, which might delay firms' issuance of equity as well as corporate investments -- Can worsen or slow down recovery from economic recessions as periods of high policy uncertainty and economic downturns tend to coincide
- Our finding that wealthier households tend to reduce their equity participation less after periods of high policy uncertainty suggests that such households can benefit from the equity premium in the long run, in contrast to the poor and middle class households