

By Popular Demand:

Voter Decision Making under Risk

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To my beloved family

Abstract

What is the role of risk in voters' political behaviour? *By Popular Demand* provides a bottom up framework exploring voter decision making under risk. The manuscript explores across three distinct settings how citizens' *exposure* or *tolerance* to risk impact their utility and how their demands translate into support for welfare spending, vote choice or the status-quo. Together, the three papers make several important theoretical and empirical contributions. The papers introduce novel measures of risk and clarify best measurement practices to avoid ecological fallacies, they emphasize the importance of private insurance, and show that risk aversion is time variant, and decreases in wealth. The manuscript concludes that risk is central to understanding changes in support for redistribution, the Left, and the status quo. Relying on research designs that account for time-invariant unobserved individual level heterogeneity, quasi-random assignment of treatment, or directly randomize the treatment, the theoretical framework is substantiated with causal evidence.

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Contents

List of Figures **xi**

List of Tables **xv**

I Introduction **1**
References 11

II Divisive Jobs: Three Facets of Risk, Precarity and Redistribution **15**
II.1 Whose Risk? 19
II.2 Departing from Group-Inferred, Static Risk 22
II.3 Data and Measurement 27
II.4 Results 31
II.5 Robustness Checks 38
II.6 Discussion 40

Appendices **43**
II.A Data Sources 43
II.B Survey items used in the analysis 43
II.C Survey Supplementary Materials 46
II.C.1 Sample Descriptives 46
II.C.2 Risk Type Descriptives and Correlates 47
II.C.3 Additional Results 49
II.C.4 Robustness Reporting 51
References 57

III The Democrat Disaster: Hurricane Exposure, Risk Aversion and Insurance Demand **63**
III.1 Threats in Context 67
III.1.1 Polarization 67
III.1.2 Accountability 69
III.2 A *Nearly Missed* Design 71
III.3 Data 75
III.3.1 Data on Storms and Hurricanes 76

III.3.2 Election Results Data . . . 76
III.3.3 Risk Aversion Data . . . 77
III.3.4 Google Data . . . 80
III.3.5 Other Data . . . 81
III.4 Results . . . 82
III.5 Spared from Destruction: Unpacking Mechanisms . . . 86
III.5.1 Risking It . . . 86
III.5.2 Alternative Mechanisms . . . 91
III.5.3 Threats to Identification . . . 95
III.6 Discussion . . . 96

Appendices **99**
III.A Appendix A – Hurricanes . . . 99
III.B Appendix B – Precinct Level Data . . . 103
III.C Appendix C – Risk Aversion: Theory and CCES Data . . . 121
III.C.1 Stable Preferences? . . . 121
III.C.2 Validation . . . 122
III.C.3 Specification . . . 123
III.C.4 Results . . . 123
III.D Appendix D – Risk Aversion: Theory and Health and Retirement Study 135
III.E Appendix E – Insurance and Google Trends Data . . . 139
III.F Appendix F – Alternative Mechanisms . . . 144
III.G Appendix G – Information, Beliefs, Preferences . . . 146
References . . . 150

IV Mind the Gap: Why Wealthy Voters Support Brexit **159**
IV.1 The Costs and Benefits of Brexit . . . 162
IV.2 The Brexit Risk . . . 164
IV.2.1 A Vote Against The Status Quo . . . 164
IV.2.2 Wealth as Insurance . . . 166
IV.3 Data and Methods . . . 168
IV.4 Results . . . 174
IV.5 Mechanisms . . . 177
IV.6 Robustness . . . 180
IV.7 Conclusion . . . 181

Appendices **185**
IV.A Appendix A – Measurement Validation . . . 185
IV.B Appendix B – Distribution of Wealth and Income . . . 187
IV.B.1 Distribution in BES Sample . . . 187
IV.B.2 Distribution in BoE Sample . . . 190
IV.C Appendix C – Who's Wealthy? . . . 192
IV.D Appendix D – Main Results Robustness . . . 196

IV.E Appendix E – Aggregate vs Individual Results 198
References 200

V Conclusion **207**
References 212

List of Figures

II.1 Discrepancies in Occupational Risk Measures 20
II.2 Defining Risk Type 24
II.3 Hypothesized Relationship 26
II.4 Risk Type and Social Spending 31
II.5 Spending Demand by Income and Risk Type 32
II.6 Changes in Risk Exposure 38
II.C.1 Jackknife Sample 47
II.C.2 Defining Job Tenure 47
II.C.3 Distribution of ρ_1 and ρ_2 in Skill Specific, Offshore, RTI 48
II.C.4 Risk and Ideology 48
II.C.5 Unemployment Spending and Social Spending 49
II.C.6 Public Swiss Social Spending (%GDP) 49
II.C.7 Robustness Within Risk Type 51
II.C.8 Spending Demand by Risk Type Over Time 51
II.C.9 Spending Demand by OUR Over Time 52

III.1 Spatial Distribution of Hurricane Paths 2003-2014 72
III.2 Distance Calculation Unit To Hurricane Path 73
III.3 Proximity to Hurricanes ↓ Democrat Vote Share in U.S. Senate 83
III.4 Proximity to Hurricanes ↓ Democrat Vote Share in U.S. House 84
III.5 Common Trends U.S. Senate and House 86
III.6 Hurricane Proximity ↑ Private Insurance Inquiries 90
III.7 Hurricane Proximity Makes Individuals Choose Riskier Gambles . . . 92
III.A.1 Hurricane Count in High-Risk Areas 2003-2014 100
III.B.1 Distribution of Distance from All Hurricanes of Precincts in Treated States 112
III.B.2 Distribution of Distance from Closest Hurricanes Experienced of Precincts in Treated States 113
III.B.3 Estimated Democrat Senate Share and Turnout 114
III.B.4 Estimated Democrat Senate Share, Partisan Registration, and Turnout 115
III.B.5 Estimated Democrat House Share and Turnout 116
III.B.6 Estimated Democrat House Share, Partisan Registration, and Turnout 117
III.B.7 Estimated Democrat U.S. Senate Share 118
III.B.8 Estimated Democrat U.S. House Share 118

III.B.9 Jackknife Estimates . . . 119
III.B.10 Placebo Estimates . . . 120
III.C.1 Distribution of Risk Aversion in CCES 2014 . . . 129
III.C.2 Distribution of Risk Aversion and Education in CCES 2014 . . . 129
III.C.3 Distribution of Risk Aversion and Gender in CCES 2014 . . . 130
III.C.4 Distribution of Risk Aversion and Race in CCES 2014 . . . 130
III.C.5 Distribution of Risk Aversion and Income in CCES 2014 . . . 131
III.C.6 Distribution of Risk Aversion and Age in CCES 2014 . . . 131
III.C.7 Distribution of Distances from Hurricanes in CCES 2014 . . . 132
III.C.8 Distribution of Distances from Placebo Hurricanes in CCES 2014 . . . 133
III.C.9 Risk Aversion by Zipcode . . . 133
III.C.10 Placebo Test: Distance from Future Hurricanes . . . 134
III.C.11 First Stage in CCES Close Proximity . . . 134
III.D.1 Distribution of Minimum Hurricane Distance HRS . . . 136
III.D.2 Distribution of Risk Aversion in HRS . . . 136
III.D.3 Distribution of Risk Aversion by Gender in HRS . . . 137
III.D.4 Distribution of Risk Aversion by Age in HRS . . . 137
III.D.5 First Stage (Pooled) in HRS High Risk Areas . . . 138
III.E.1 Gtrends Result: Hurricane Proximity and FEMA Searches . . . 142
III.E.2 Gtrends Result: Hurricane Proximity and Real Estate Agencies . . . 142
III.E.3 Zillow Data Result: Hurricane Proximity and Home Values and Sales 143
III.F.1 Hurricane Proximity and Religiosity . . . 144
III.F.2 Hurricane Proximity and Authoritarianism . . . 145
III.F.3 Hurricane Proximity and Roads . . . 145
III.G.1 Estimated Effect of Hurricane Irene on NJ Democrat Vote Share . . . 147
III.G.2 Hurricane Proximity and Incumbent Victory in US House . . . 149

IV.1 Residuals Wealth on Probability to Support Leave . . . 176
IV.2 Expectations of Brexit Effect on National vs Personal Finances . . . 178
IV.3 Main Effects by Prior EU Integration Preferences . . . 180
IV.A.1 Leaver Status and Income and Wealth Reporting . . . 186
IV.B.1 Distribution of Home Ownership by Income . . . 188
IV.B.2 Distribution of Income by Savings . . . 188
IV.B.3 Distribution of Income by Debt . . . 189
IV.B.4 Distribution of Income by Ownership . . . 189
IV.B.5 Distribution of Home Ownership by Income . . . 190
IV.B.6 Distribution of Income by Savings . . . 191
IV.B.7 Distribution of Income by Debt . . . 191
IV.B.8 Distribution of Income by Ownership . . . 191
IV.C.1 Median Home Value at LSOA (2017 Prices) . . . 192
IV.C.2 Are Leavers Wealthier? . . . 193
IV.C.3 Property Wealth by Demographic Characteristics . . . 194
IV.C.4 Financial Wealth by Demographic Characteristics . . . 195

IV.D.1 Survey Experiment Randomization Check 196
IV.D.2 Respondents Do Not Believe Post-Brexit Home Prices are Changing as a function of Property Wealth 197
IV.E.1 Leave Support Aggregate vs Individual 198
IV.E.2 BES Main Results by High/Low LSOA Median Home Prices 199

List of Tables

II.1 Pooled Analysis: Risk and Social Spending Demand 34
II.2 Fixed Effects Analysis: Risk and Social Spending Demand 37
II.A.1 Data Sources 43
II.C.1 Summary Statistics 46
II.C.2 Characteristics of Respondents by Number of Contact 46
II.C.3 Characteristics Transit and No-Transit Groups 50
II.C.4 Conceptual Validity and Other Observables 53
II.C.5 Mechanism Validity 55
II.C.6 Non-Linear Specifications: Risk and Social Spending 56

III.A.1 Types of Hurricanes: Saffir-Simpson 100
III.A.2 Hurricanes Considered 101
III.A.3 Placebo Hurricanes Considered 101
III.A.4 Sequence of Hurricanes and Placebo Hurricanes 102
III.B.1 Data Sources for Precinct-Level Estimation 103
III.B.2 Democrat Vote Share U.S. Senate: Main Specification 104
III.B.3 Democrat Vote Share U.S. House: Main Specification 105
III.B.4 Democrat Vote Share: Main Specification (Continuous Treatment) . . 106
III.B.5 Democrat Vote Share U.S. Senate: Closest Distance 107
III.B.6 Democrat Vote Share U.S. House: Closest Distance 108
III.B.7 Democrat Vote Share: Closest Distance Specification (Continuous Treatment) 109
III.B.8 Democrat Vote Share: Strongest Hurricane Specification 110
III.B.9 Democrat Vote Share: Strongest Hurricane Specification (Continuous Treatment) 111
III.C.1 CCES Summary Statistics 125
III.C.2 Strongest Hurricane Experienced in CCES 126
III.C.3 Closest Hurricane Experienced in CCES 126
III.C.4 Interaction Effects Distance and Wind in CCES 127
III.C.5 Reduced Form: Strongest Hurricane Exposure and Democrat Vote . . 127
III.C.6 Reduced Form: Closest Hurricane Exposure and Democrat Vote . . . 128
III.D.1 HRS Summary Statistics 135
III.D.2 Correlation Movers and Risk Aversion in HRS 135
III.D.3 First Stage: Closest Hurricane HRS 138

III.E.1 Hurricane Distance and Monthly Google Searches 2004-2015 140
III.E.2 Hurricane Distance and Weekly Google Searches 2004-2009 141

IV.1 Wealth Items 171
IV.2 Experimental Conditions 173
IV.3 Leave Vote, Income and Wealth (BES Sample) 174
IV.4 Leaver Status, Income and Wealth (BoE Sample) 175
IV.5 Wealth Increases Brexit Support (Survey Experiment) 176
IV.6 Effect of Wealth Treatment on Risk Aversion 179
IV.A.1 Measurement Validation against Official Statistics 185
IV.D.1 Main Results with DK 196

I

Introduction

'When you pay attention to a threat, you worry – and the decision weights reflect how much you worry. Because of the possibility effect, the worry is not proportional to the probability of the threat. Reducing or mitigating the risk is not adequate; to eliminate the worry the probability must be brought down to zero' (Kahneman, 2011). In fact, Bernoulli (1738) first observed that most people dislike risk.

For decades now, economists have studied decision making under uncertainty and risk (Knight, 1921; Arrow, 1971; Tversky and Kahneman, 1979). Political scientists, however, have started exploring these behaviours more recently, maintaing though a sharp distinction between the two. For example, talking about how institutions came about, North (1991) identifies the innovation in transforming uncertainty into risk. That is, transforming a state whereby one does not know the probability of a (bad) event, and therefore cannot insure against, into *risk*, a defined probability of the likelihood of an event and hence the ability to insure against such an outcome.

At the same time, Esping-Andersen (1990) observed that nation states – and, in particular, their welfare systems – differ in how they constrain behaviour and provide social assistance to their citizens, varying in the degree in which 'individuals, or families, can uphold a socially acceptable standard of living independently of market participation'. This insurance function, or 'piggy bank', arises due to imperfect information, risk and

uncertainty in the labour market, and is considered the main reason why individuals cannot adequately privately insure themselves (Barr, 2001). However, individuals' insurance cover not only varies between welfare systems (or market economies as in Hall and Soskice (2001)), but varies very much so within a system as well.

The very existence of welfare states is explained by citizens' inability to foresee and insure against unfortunate economic events. In fact, a growing literature identifies a spike in support for welfare spending among those likely to experience a shock, such as unemployment, income volatility, sickness, or crime (Alesina and La Ferrara, 2005; Moene and Wallerstein, 2001; Rueda and Stegmueller, 2019; Rehm et al., 2012; Mares, 2003; Rueda and Stegmueller, 2016; Ahlquist et al., 2020; Pahontu et al., 2020) or among those with low tolerance to such an experience and preference for certainty, more broadly (Duch and Rueda, 2015; Gärtner et al., 2017; Durante et al., 2014). More recently, scholars observed that, in fact, relying on one's assets to cushion oneself against potential economic shocks could dampen these effects and therefore lower support for the welfare state (Ansell, 2014).

By Popular Demand: Voter Decision Making Under Risk, henceforth *By Popular Demand*, offers an in-depth theorizing and analysis of voter decision making under risk and advances a bottom up framework exploring how variation in individual experiences impact on insurance demand and political behaviour. The framework assumes voters are rational, and participate in elections to select "good types" rather than to sanction poor performing candidates (Downs, 1957; Fearon, 1999). The manuscript explores across three distinct settings how citizens' *exposure* or *tolerance* to risk impact their utility and how their demands translate into support for welfare spending, vote choice or the status-quo.

Traditionally, individual risk attitudes are assumed to be constant (Stigler and Becker, 1977). Yet, recent empirical evidence suggests quite the contrary. For exam-

ple, individuals experiencing economic downturns (Cohn et al., 2015; Malmendier and Nagel, 2011; Guiso et al., 2013; Weber et al., 2012), health shocks (Decker and Schmitz, 2016) or natural disasters (Eckel et al., 2009; Cameron and Shah, 2015) change their risk-taking behaviour across time. Therefore, this dissertation emphasizes not only that risk aversion is conceptually separate from risk exposure, but that both are indeed time-variant.

The first paper, *Divisive Jobs: Three Facets of Risk, Precarity and Redistribution*, henceforth *Divisive Jobs*, studies time-variant risk exposure in the form of unemployment risk – i.e. the possibility of losing one's job. It deals with a central challenge in understanding public opinion shifts: identifying whose opinions change. Political economy models typically try to uncover this by exploring voters' economic vulnerability, in particular the relationship between labour market risk and redistribution preferences. Predominantly, however, such work imputes risk from group-level characteristics and is static in nature (Iversen and Soskice, 2001; Thewissen and Rueda, 2019). This makes interpretations of welfare state support and its relationship to risk unreliable. The paper proposes therefore an individual level, dynamic account of risk inferred from employment characteristics – perceived job security, job tenure and contract type. These, importantly, account for the possibility that one's experience of risk may change across time. I then show how changes in workers' risk determine changes in their public spending demand. Emphasizing dynamic preferences and risk, this paper's findings enhance understanding of the political economy of welfare state support.

The second paper, *The Democrat Disaster: Hurricane Exposure, Risk Aversion and Insurance Demand*, henceforth *The Democrat Disaster*, explores voters' response to heightened risk. Dominant theories expect issues of accountability to surface or distributional conflict to intensify, once threats become salient (Achen and Bartels, 2016; Montalvo, 2011; Alesina and La Ferrara, 2005; Rueda and Stegmueller, 2019). Unsatis-

factorily, these accounts rely on compound treatment effects of exposure not only to risk but also to direct losses or self-selection into unfortunate circumstances. To circumvent these issues, I use difference-in-differences estimates of *nearly*-hit disaster high-risk areas in the United States to study the effect of risk on vote choice. I identify significant electoral penalties for the Democratic Party whose vote share decreases for both US House and Senate races between 2002 and 2014 following a near miss. Conventional explanations related to religiosity, authority, information, or competence fail to explain this effect. Instead, I propose that Republican gains are driven by voters' spending on private insurance and increased willingness to take risks when spared from disaster. I therefore advance an alternative theoretical explanation for vote choice under risk. Importantly, this paper tests the existence of a time-variant component in risk aversion and concludes that risk attitudes may change over time.

Support for populism – including Brexit – is expected primarily among lower income voters. Little is understood about motivations among high income, and, in particular, wealthy voters. The third paper (with Jane Green), *Mind the Gap: Why Wealthy Voters Support Brexit*, henceforth *Mind the Gap*, proposes an insurance-based mechanism that expects wealthier individuals to support – rather than oppose – Brexit. As assets can cushion against uncertain economic circumstances triggered by a change to the status quo, wealthy voters are therefore able to vote on their Brexit preferences at higher rates than those lacking the same insurance. We suggest that the underlying mechanism sees wealthier, privately insured voters, more willing to take financial risks. These findings have implications for the role of wealth in explaining support for risky political outcomes, changes to the status quo, and provide a deeper understanding of the causes behind Britain's decision to exit the European Union.

Together, the three papers make several important theoretical and empirical contributions. The papers introduce novel measures of risk and clarify best measurement

practices to avoid ecological fallacies, they emphasize the importance of private insurance, and show that risk aversion is time variant, and decreases in wealth. *By Popular Demand*, concludes that an increase in risk aversion or exposure to risk increases support for redistribution, the Left, and status quo change.

Risk and Wealth

Risk attitudes play a central role in determining an individual's utility from pursuing a certain action. Risk averse voters would therefore prefer a certain and secure although smaller gain over a less certain but potentially higher reward (Kahneman and Tversky, 1984). An important assumption made in *Divisive Jobs*, very much consistent with earlier work on the stability of risk aversion (Stigler and Becker, 1977; Duch and Rueda, 2015), is that risk attitudes are constant over time, for a given individual. This assumption is relaxed in the second and third papers, which show that individual risk attitudes may be time variant. Importantly, *The Democrat Disaster* clarifies what it means for risk aversion to vary over time. Temporal stability of risk attitudes can either mean that the individual has the same risk attitude over time or that the risk attitude is a stable function of opportunities that change over time (Andersen et al., 2008). Most of the empirical evidence available defines risk aversion in the former sense. Yet, this makes it difficult to attribute changes in outcome to changes in risk, if other individual characteristics also change.

In order to isolate risk, *The Democrat Disaster* looks at nearly hit areas, and therefore relies on constant income and wealth. This is different in *Mind the Gap*, where an individual's wealth varies over time. As I discuss in the former paper, the reason individuals' willingness to take risks changes may be related to wealth, or insurance of that wealth. As Arrow (1971) notes, 'the behavior of these measures as wealth varies is

of the greatest importance for prediction of economic reactions in the presence of uncertainty'. A number of studies have since confirmed the role of wealth in reducing risk aversion (Guiso and Paiella, 2008; Paravisini et al., 2017; Zanetti, 2014; Malmendier and Nagel, 2011).

The claim that risk aversion may decrease in wealth is made theoretically in *The Democrat Disaster*. In that context, individual wealth does not change, but individuals' insurance does. I argue there that purchasing insurance aimed at protecting at-risk assets provides an as-if wealth effect, which paired with updated beliefs about the riskiness of one's environment cause the decrease in risk aversion. The relationship between wealth and risk is directly tested – both observationally and experimentally – in *Mind the Gap*. This time, an individual's wealth is not at risk, and, by contrast, it provides the insurance needed to afford a risky political choice – a status quo change.

The results, based on similar measures of risk aversion following Barsky et al. (1997), provide support for the relation between risk and wealth, but emphasize that in order for wealth to reduce risk aversion, individuals' utility should depend not only on consumption, but also on wealth, unlike the traditional Arrow-Pratt function.

Private Insurance

Existing literature in political economy largely neglects the possibility that voters could insure themselves privately. Indeed, as Barr (2001) suggests, the piggy bank function arises due to imperfect information, and uncertainty more broadly. 'The market failures that give rise to the government provision of social insurance include the failure to provide insurance for many of the most important risks facing individuals' (Stiglitz, 1988, p.344).

The principle of *adverse selection* is present whenever one talks about insurance.

Consider health insurance: "it is quite possible that every individual in the market would be willing to pay the expected cost of his Medicare and buy insurance, yet no insurance company can afford to sell him a policy – for at any price it will attract too many 'lemons'" (Akerlof, 1970). The problem is not that people differ in their riskiness, but that insurers do not have the information about the individual's risk type. Hence, the insurance function of welfare states solves cases in which individuals cannot assign a probability of a bad event occurring (uncertainty) and those in which individuals could conceal their risk type from the insurer.

In contrast to private insurance, social insurance copes not just with risk but also with uncertainty. Because risks can change over time, welfare states provide a less specific 'contract' allowing for contingencies that come into existence as societies develop – such as breakdown of extended family or modern medicine (Barr, 2001; Atkinson, 1995).

Although true for unemployment insurance as I explore in *Divisive Jobs*, social insurance may not be appropriate for other risks individuals may face. In fact, the literature has largely neglected the role of private insurance in individuals' support for the welfare state, and other political behaviours. How do voters respond when certain types of state-provided insurance do not exist? What if individuals were to provide the insurance themselves? *By Popular Demand* explores these questions in two contexts: the role of private insurance in the face of natural disasters and the impact on Democrat support in the United States, *and* the role of wealth as insurance in the case of Brexit.

In *The Democrat Disaster* I discuss the importance of accounting for private insurance. I explain that once private insurance is factored in, a two-step process links hurricane exposure to individual behaviour. First, exposure to risk increases risk-averse behaviour by updating beliefs about the riskiness of the environment. If increasingly risk-averse individuals value their at-risk assets, then their optimal choice is to pur-

chase private insurance. If hit, the damage would impose substantial costs, which is why insurance becomes relatively more expensive. If purchased, this reduces the affordability of existing income tax, given a budget constraint. Relying instead on federally provided assistance such as FEMA becomes less appealing not only because this would not provide the desired type of insurance (e.g. car insurance) but also because this involves a more uncertain process including but not limited to applicant eligibility, which increasingly risk averse individuals do not optimally prefer. I show that once private insurance is recognized as an option available to individuals, social insurance – in the form of income tax – becomes less appealing and parties promoting it – the Democrats – suffer electorally. Therefore, in this paper, private insurance competes with, rather than completes, social insurance and forces individuals, given a budget constraint, to trade-off one in favour of the other.

If states fail to provide certain types of insurance, why not rely on family, friends, the church or charities to help one cope with risk? As Stiglitz (1989) notes, 'what makes unemployment so painful [...] is not the loss of lifetime income, but the inability of individuals to borrow to meet current needs'. There are risks, however, that individuals may indeed be able to provide insurance for themselves, a notable omission in the political economy literature as recently noted (Ansell, 2014). As we discuss in *Mind the Gap*, individuals wealth can cushion against the economic risks associated with a status quo change, Brexit, and this has important implications for our understanding of support for populism.

Empirical Risks

By Popular Demand addresses two types of empirical 'risks' that may decrease confidence in the estimated quantities of interest – imputing individual characteristics

from group-level attributes and endogeneity.

Divisive Jobs and *Mind the Gap* argue that risk exposure and wealth are best measured at individual level and point toward the dangers of imputing to individuals such characteristics from the groups in which they belong – their occupations or areas where they reside. The former paper finds that occupations mask greater variation in unemployment risk than currently thought, and that in order to better capture individual support for social spending, individuals' objective and subjective job security need to be taken into account. The latter paper distinguishes wealthy individuals living in rich areas in Britain – i.e. truly wealthy – from those living in poorer areas and explores their support for a status quo change. Making this distinction allows us to identify an *individual* wealth effect, which is stronger among wealthy individuals in richer areas.

'I checked it very thoroughly [...] and that quite definitely is the answer' (cited in Angrist and Pischke (2009)). Until recently, political science was ill-equipped to uncover the true cause of an effect. From economic development and democracy (Lipset, 1959) to electoral system consequences (Rae, 1967), unobserved characteristics and reverse causality have always constituted an important caveat to political science research.

Each paper addresses endogeneity concerns by relying on research designs that account for time-invariant unobserved individual level heterogeneity, that rely on quasi-random assignment of treatment, or directly randomize the treatment. Therefore, the results increase confidence in the estimated causal effects. Considerable effort was necessary to collect and assemble data fit for exploring the above theoretical arguments. Therefore, *By Popular Demand* includes a rich collection of historical and administrative data, public opinion, asset and wealth surveys, newly collected election and insurance data, and a variety of methods including panel data estimation, data scraping, and spatial analysis.

From Here

'We are prone to overestimate how much we understand about the world and to underestimate the role of chance in events' (Kahneman, 2011). The coming chapters make an effort to address and expand on the issues presented above. *By Popular Demand: Voter Decision Making Under Risk* proceeds alike an economic roller coaster, from the experience of unemployment, precarity and gig work in Chapter II *Divisive Jobs: Three Facets of Risk, Precarity and Redistribution*, to being *nearly*-missed by the strongest, most catastrophic hurricanes in the United States from the last two decades in Chapter III *The Democrat Disaster: Hurricane Exposure, Risk Aversion and Insurance Demand*, to finally, making one relive and make sense of one of the riskiest economic decisions in a generation in Chapter IV *Mind the Gap: Why Wealthy Voters Support Brexit*. At the end of the ride, I hope to provide the reader with a better grip of risk and understanding of its centrality in people's lives. After all, politics happens by popular demand.

References

Achen, Christopher H and Bartels, Larry M (2016). *Democracy for Realists: Why Elections Do Not Produce Responsive Government*. Princeton University Press.

Ahlquist, John, Copelovitch, Mark, and Walter, Stefanie (2020). The Political Consequences of External Economic Shocks: Evidence from Poland. *American Journal of Political Science*.

Akerlof, George A (1970). The Market for 'Lemons': Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics*, 84(3):488–500.

Alesina, Alberto and La Ferrara, Eliana (2005). Preferences for Redistribution in the Land of Opportunities. *Journal of Public Economics*, 89(5-6):897–931.

Andersen, Steffen, Harrison, Glenn W, Lau, Morten I, and Elisabet Rutström, E (2008). Lost in State Space: Are Preferences Stable? *International Economic Review*, 49(3):1091–1112.

Angrist, Joshua D and Pischke, Jörn-Steffen (2009). *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press.

Ansell, Ben (2014). The Political Economy of Ownership: Housing Markets and the Welfare State. *American Political Science Review*, 108(2):383–402.

Arrow, Kenneth J (1971). *Essays in the Theory of Risk-Bearing*. Markam Chicago.

Atkinson, Anthony Barnes (1995). *Incomes and the Welfare State: Essays on Britain and Europe*. Cambridge University Press.

Barr, Nicholas Adrian (2001). *The Welfare State as Piggy Bank: Information, Risk, Uncertainty, and the Role of the State*. Oxford University Press.

Barsky, Robert B, Juster, F Thomas, Kimball, Miles S, and Shapiro, Matthew D (1997). Preference Parameters and Behavioral Heterogeneity: An Experimental Approach in the Health and Retirement Study. *The Quarterly Journal of Economics*, 112(2):537–579.

Bernoulli, Daniel (1738). Specimen Theoriae Novae de Mensura Sortis. *Commentarii Academiae Scientarium Petropolitanae*, 5:175–192. English Translation by Louise Sommer, Exposition of a New Theory on the Measurement of Risk, Econometrica, 1954, 22, 23–36.

Cameron, Lisa and Shah, Manisha (2015). Risk-Taking Behavior in the Wake of Natural Disasters. *Journal of Human Resources*, 50(2):484–515.

Cohn, Alain, Engelmann, Jan, Fehr, Ernst, and Maréchal, Michel André (2015). Evidence for Countercyclical Risk Aversion: An Experiment with Financial Professionals. *American Economic Review*, 105(2):860–85.

Decker, Simon and Schmitz, Hendrik (2016). Health Shocks and Risk Aversion. *Journal of Health Economics*, 50:156–170.

Downs, Anthony (1957). *An Economic Theory of Democracy*. New York: Harper.

Duch, Raymond M and Rueda, David (2015). The People You Are: Personality Traits as Determinants of Redistribution Preferences. `https://ssrn.com/abstract=2840433`.

Durante, Ruben, Putterman, Louis, and Van der Weele, Joël (2014). Preferences for Redistribution and Perception of Fairness: An Experimental Study. *Journal of the European Economic Association*, 12(4):1059–1086.

Eckel, Catherine C, El-Gamal, Mahmoud A, and Wilson, Rick K (2009). Risk Loving after the Storm: A Bayesian-Network Study of Hurricane Katrina Evacuees. *Journal of Economic Behavior & Organization*, 69(2):110–124.

Esping-Andersen, Gosta (1990). *The Three Worlds of Welfare Capitalism*. Princeton University Press.

Fearon, James D (1999). Electoral Accountability and the Control of Politicians: Selecting Good Types versus Sanctioning Poor Performance. In Bernard Manin, Adam Przeworski and Stokes, Susan, editors, *Democracy, Accountability, and Representation*. Cambridge University Press.

Gärtner, Manja, Mollerstrom, Johanna, and Seim, David (2017). Individual Risk Preferences and the Demand for Redistribution. *Journal of Public Economics*, 153:49–55.

Guiso, Luigi and Paiella, Monica (2008). Risk Aversion, Wealth, and Background Risk. *Journal of the European Economic Association*, 6(6):1109–1150.

Guiso, Luigi, Sapienza, Paola, and Zingales, Luigi (2013). Time Varying Risk Aversion. *National Bureau of Economic Research*.

Hall, Peter A and Soskice, David (2001). *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage*. Oxford University Press.

Iversen, Torben and Soskice, David (2001). An Asset Theory of Social Policy Preferences. *American Political Science Review*, 95(4):875–893.

Kahneman, Daniel (2011). *Thinking, Fast and Slow*. Macmillan.

Kahneman, Daniel and Tversky, Amos (1984). Choices, Values, and Frames. *American Psychologist*, 39(4):341.

Knight, Frank H (1921). *Risk, Uncertainty and Profit*. New York, NY: Sentry Press.

Lipset, Seymour Martin (1959). Some Social Requisites of Democracy: Economic Development and Political Legitimacy. *American Political Science Review*, 53(1):69–105.

Malmendier, Ulrike and Nagel, Stefan (2011). Depression Babies: Do Macroeconomic Experiences Affect Risk Taking? *Quarterly Journal of Economics*, 126(1):373–416.

Mares, Isabela (2003). *The Politics of Social Risk: Business and Welfare State Development*. Cambridge University Press.

Moene, Karle Ove and Wallerstein, Michael (2001). Inequality, Social Insurance, and Redistribution. *American Political Science Review*, 95(4):859–874.

Montalvo, Jose G (2011). Voting after the Bombings: A Natural Experiment on the Effect of Terrorist Attacks on Democratic Elections. *Review of Economics and Statistics*, 93(4):1146–1154.

North, Douglass C (1991). Institutions. *Journal of Economic Perspectives*, 5(1):97–112.

Pahontu, Raluca L, Hooijer, Gerda, and Rueda, David (2020). Insuring Against Hunger? Long-Term Political Consequences of Exposure to the Dutch Famine.

Paravisini, Daniel, Rappoport, Veronica, and Ravina, Enrichetta (2017). Risk Aversion and Wealth: Evidence from Person-to-Person Lending Portfolios. *Management Science*, 63(2):279–297.

Rae, Douglas W (1967). *The Political Consequences of Electoral Laws*. New Haven: Yale University Press.

Rehm, Philipp, Hacker, Jacob S, and Schlesinger, Mark (2012). Insecure Alliances: Risk, Inequality, and Support for the Welfare State. *American Political Science Review*, 106(2):386–406.

Rueda, David and Stegmueller, Daniel (2016). The Externalities of Inequality: Fear of Crime and Preferences for Redistribution in Western Europe. *American Journal of Political Science*, 60(2):472–489.

Rueda, David and Stegmueller, Daniel (2019). *Who Wants What?: Redistribution Preferences in Comparative Perspective*. Cambridge University Press.

Stigler, George J and Becker, Gary S (1977). De Gustibus Non Est Disputandum. *American Economic Review*, 67(2):76–90.

Stiglitz, Joseph E (1988). *Economics of the Public Sector*. New York: Norton.

Stiglitz, Joseph E (1989). *The Economic Role of The State*. Oxford: Basil Blackwell.

Thewissen, Stefan and Rueda, David (2019). Automation and the Welfare State: Technological Change as a Determinant of Redistribution Preferences. *Comparative Political Studies*, 52(2):171–208.

Tversky, Amos and Kahneman, Daniel (1979). Prospect Theory: An Analysis of Decision under Risk. *Econometrica*, 47(2):263–291.

Weber, Martin, Weber, Elke U, and Nosić, Alen (2012). Who Takes Risks When and Why: Determinants of Changes in Investor Risk Taking. *Review of Finance*, 17(3):847–883.

Zanetti, Francesco (2014). Housing and Relative Risk Aversion. *Economics Letters*, 123(1):23–25.

II

Divisive Jobs: Three Facets of Risk, Precarity and Redistribution

The past few decades have seen a remarkable transformation in labour markets across the advanced industrial societies: employment opportunities decreased in certain industries and occupations, and not others. This development is attributed to increasing reliance on technological change, the embeddedness of production and trade in global markets, and the decline in Fordism (Autor et al., 2003; Scheve and Slaughter, 2004; Iversen and Cusack, 2000). As the labour share declined across the OECD and domestic labour markets became more reliant on precarious jobs, citizens' economic experiences and redistribution preferences have attracted a great deal of scholarly attention. As prior work has shown, vote choice is largely driven by changes in economic circumstances and concerns over taxation (Margalit, 2013; Ahlquist et al., 2020).

A core result in this literature holds that voters are motivated by self-interest in forming redistribution preferences. In particular, significant changes in one's economic standing, whether realized (e.g. job loss) or expected (e.g. a sharp increase in one's likelihood of getting unemployed), are predicted to shape these preferences, well beyond what a voter's income would suggest (Meltzer and Richard, 1981; Rehm, 2009). This is found true for individuals working in industries or occupations exposed to the risk of automation, outsourcing and offshoring, or necessitating more specific skill investments

(Walter, 2017; Thewissen and Rueda, 2019; Iversen and Soskice, 2001). In brief, citizens working in risky occupations or industries are expected to support social spending more than their less risk exposed counterparts.

Such conjectures, however, rely on two crucial premises. For the results to hold, one needs first to assume that the same people would hold different, maybe even opposite, views had their economic circumstances been different than the observed ones. Such a causal implication is not however substantiated with empirical support, as most work relies on cross-sectional comparisons. More substantively, this research is overwhelmingly static in nature, as individuals' preferences and economic situation is observed and quantified only at a given point in time. An open question therefore is whether this empirical relationship is dynamic in nature, specifically whether individuals' preferences change in response to shifts in personal circumstances.

This is an important question for understanding shifts in public opinion and the malleability of preferences. For example, following the crisis, conventional wisdom expected public opinion to shift left, but support for populism increased instead (Funke et al., 2016). To the extent that economic hardship is correlated with support for radical parties (Guiso et al., 2019), exploring the dynamic nature of labour market risk could contribute to a better understanding of the changes in the political landscape. Relatedly, it is important to understand just how volatile voters' preferences are to be able to anticipate what level of economic insecurity is likely to contribute to changes in public opinion (O'Grady, 2019).

A second implicit assumption is that workers within the same industry or occupation experience labour market risk in the same way. Predominantly, existing work commits an ecological fallacy by imputing to respondents risk from group-level characteristics, such as their occupation. Most influential work proposes that risk clusters at the occupation level, but they disagree to which aspect of an occupation matters,

and as I explain below, this leads to dramatically different conclusions. In brief, I show that redistribution preferences are much more diverse within a given occupation than it is currently thought and that individuals changing employment characteristics, even if that is within the same occupation, do change preferences in accordance to the former not the latter. Therefore, I argue that most research that explores redistribution preferences is currently ill-equipped to identify which individuals (rather than occupations) are exposed to labour market risk, how they experience risk over time and how this labour market dynamic impacts on their support for the welfare state.

This paper takes an initial step in addressing these challenges and departs from work imputing to respondents risk solely associated with their occupation and from work that is only static in nature. In doing so, I make the following two contributions.

First, I recognize a dynamic risk component and I account empirically for unobserved individual heterogeneity by relying on a long-run panel data. Although this strategy does not entirely eliminate all possible inferential difficulties resultant from risk not occurred randomly, it does allow me to control for key individual characteristics such as motivation or early family upbringing. Assuming further that the preferences of those whose risk changes and those whose risk does not change follows a similar path before the change in risk occurs, I demonstrate by comparing the average change in views of the two groups that experiencing a change in risk does inform a change in preferences.

Second, I avoid imputing risk from occupational or industry characteristics by exploring individuals' labour market experience, captured through their employment characteristics. In brief, I maintain that individuals will demand higher insurance against risk when they are in riskier jobs, not necessarily in riskier occupations. In fact, I show that job vulnerability is a much better predictor of social spending demand than previously thought (Schwander and Hausermann, 2013). Expanding on earlier work

focusing on employment status (Rueda, 2007; Burgoon and Dekker, 2010; Marx and Picot, 2018), I suggest that both subjective and objective employment risks matter in forming redistribution preferences, but that dichotomizing risk is ill-equipped for increasingly transient and insecure working patterns. In the spirit of a dynamic account, I suggest that not only the current status but also the frequency with which one experiences change, matters. Therefore, I introduce as a measure of employment risk a workers' job tenure, alongside measures previously considered such as contract type and subjective job insecurity. Finally, I identify these three characteristics to map onto three employment risk types – those in secure jobs, those expecting or likely to lose their jobs and those who have lost their jobs. I extend this framework to the study of redistribution preferences and contribute to a growing literature on the micro-level link between personal exposure to risk and individual-level political preferences (Margalit, 2019; Hacker, 2019; Rueda and Stegmueller, 2019).

By making these two contributions, the paper proposes a new method to classify labour market risk and shows that labour market transitions (not just downward) substantially impact on welfare state preferences – e.g. decreasing one's risk makes her up to 4 percentage points less likely to support redistribution. At a time when populist appeals are on the rise and concerns over redistribution often dominate the political discourse, this papers' findings not only contribute to understanding public opinion shifts but also speak to the comparative government literature more broadly. For example, Guiso et al. (2019) show that becoming more economically insecure decreases the likelihood to turnout in elections. If risk, however, does not cluster within clearly identifiable socio-economic groups like occupations, as this paper argues, then the impact on turnout could be interpreted as parties' hardship in mobilizing scattered economically insecure individuals.

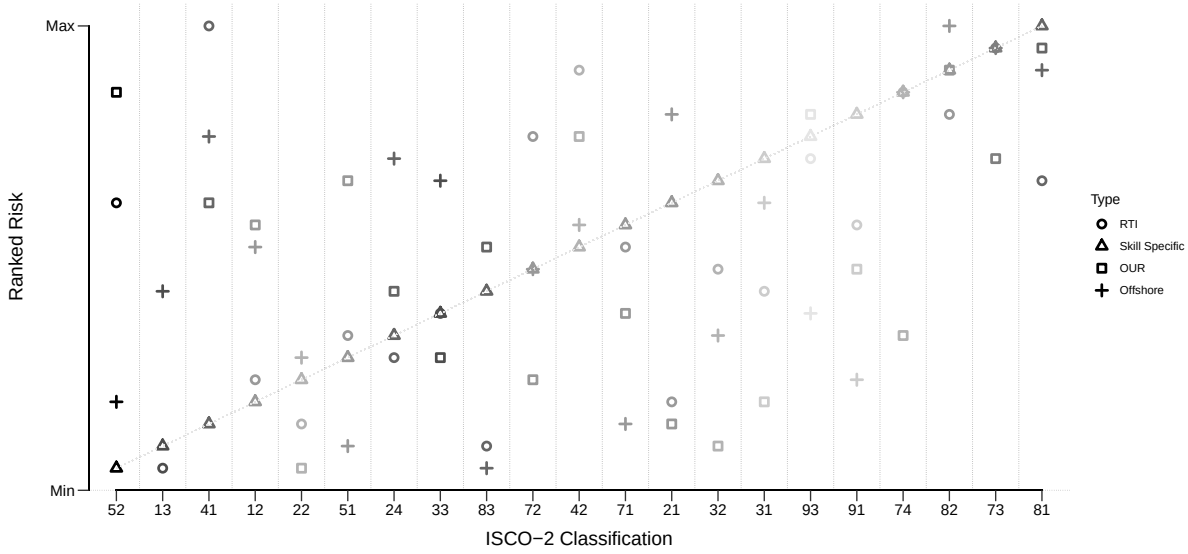
II.1 Whose Risk?

Most operationalizations of risk emerge at the occupational level. For example, in an influential article, Iversen and Soskice (2001) introduce the concept of skill-specificity – i.e. the portability of one's skills across firms or groups of firms – as a source of workers' risk exposure. They maintain that workers with specific skills are valuable only to one firm or occupation, whereas it is easier for those with more general skills to find employment in a different occupation or industry, a fact which lowers the latter's risk exposure. Their contribution is reinforced in Rehm (2009), who argues that involuntary switches between occupations are more costly than between industries, which is why occupational risk (i.e. occupational unemployment rates – OUR) should be the central focus of analysis. Technological change or globalization (e.g. offshoring) are also expected to impact an occupation's risk. For example, those in occupations least reliant on repetitive tasks (e.g. managers) or tasks that cannot be performed abroad (e.g. drivers) are expected to be least exposed to labour market risks (Thewissen and Rueda, 2019; Walter, 2017).

Aside from the fact that risk is inferred from one's occupation, this work disagrees about what aspect of an occupation is most important in identifying risk, and this leads to dramatically different conclusions as FIGURE II.1 shows. The figure plots on the y-axis the ranked risk of each available ISCO-2 occupation based on routine task intensity, skill specificity, offshoring and occupational unemployment rate. If each occupation was identified by all these measures to be similarly risk exposed, then all observations should fall on the dotted diagonal line. Yet, as the figure shows, it is almost never the case that operationalizations of occupational risk are consistent with one another. Surely, identifying correctly who is insecure is essential in theorizing about coalitions in support of welfare spending. For example, Cusack et al. (2006) discuss partisanship

implications of risk exposure. But, if insecurity is not appropriately specified, the validity of existing partisanship considerations may be less reliable. Therefore, the pattern identified in FIGURE II.1 prompts the question why this happens and whether occupations are indeed the most suitable levels of analysis.

FIGURE II.1: DISCREPANCIES IN OCCUPATIONAL RISK MEASURES



NOTE: y-axis denotes the ranked risk of each available ISCO-2 occupation based on routine task intensity (RTI), skill-specificity, offshorability (Offshore) and occupational unemployment rates (OUR). On the x-axis, ISCO-2 occupations are ordered with respect to their ranked risk on the skill specificity measure. Within each ISCO-2 group, greater vertical spread between the occupational risk measures implies greater discrepancies in ranked risk. If there were no or little disparities, all occupational risk measures should have been overlapping over the dotted diagonal line.

The sizeable variation in FIGURE II.1 may be due to a couple of factors. Firstly, the hypothesized occupational risk is country- and time- invariant. This means that fishermen are predicted to be equally risky in Switzerland as they are in Greece, and, equally risky today as they were 10 years ago. Gingrich and Ansell (2012) show it is problematic to assume that occupational risk is constant across countries. This paper signals, in addition, the perils of the time-invariance assumption and uncovers the dynamic nature of employment risk and its relationship to redistribution preferences.

Secondly, risk is assumed homogeneous within each occupation. For example, all

drivers are assumed to face a homogeneous risk in the labour market which, based on most measures, is not too high. Because existing accounts omit recent labour market developments, such as the growing gig economy, it follows that an Uber driver should be considered not only relatively sheltered, but also equally protected as a public-sector driver employee. In reality, however, occupational risk is not homogeneous. Most likely Uber drivers and public sector employees experience risk quite differently, and their support for social spending is likely to vary a lot more than it is currently accepted. In what follows, I argue risk varies with employment characteristics and that most individuals in high risk occupations are in fact working a precarious job. As recent work around OECD clarifies, it is the case that, for example, 'routine jobs based on standard contracts have been substituted by routine jobs in non-standard work forms' (Codagnone et al., 2016; OECD, 2015, p.10). Conversely, it may also be the case that some individuals in low risk occupations are undergoing precarious work (e.g. gig workers). These facts are not observable at the occupation level.

The related dualization literature similarly maintains that employment characteristics – rather than occupations – make outsiders vulnerable, though only to unemployment. This framework, however, does not account for the possibility of upward transitions for outsiders or downward transitions for insiders. Although active labour market policies may be considered a form of intertemporal transfer of income, they do not capture insurance demands, as insiders cannot experience any labour market risk. To the extent that economic disadvantage and insecurity are cross-cutting (Rehm et al., 2012), it becomes less clear that this assumption holds.

Because individuals can switch between jobs at a lower cost than between occupations, it becomes precisely such within-occupation experience of risk that individuals actually face. The results in FIGURE II.1 speak directly then to the limitations of imputing risk from group-level characteristics.

II.2 Departing from Group-Inferred, Static Risk

I propose a dynamic approach to risk based on employment characteristics. I suggest high risk is associated with high subjective job insecurity – whether the individual *perceives* precarity – and objective job insecurity – whether the individual's job characteristics imply precarity. The logic for combining the two is based on the idea that individuals use heuristics from their daily on-the-job experiences to situate themselves in the risk distribution. As secure employment may be defined as continuous, full-time employment (Fudge and Owens, 2006), such heuristics would be a function of contract-type – part-time vs full-time – and job tenure.

Among the two, part-time has previously been used as an indication of economic vulnerability, including in the dualization literature (King and Rueda, 2008). Job tenure, on the other hand, has not. Yet, consistent with recent work, frequent changes in risk are likely to increase the propensity to experience anxiety about future job loss (Davis and Von Wachter, 2011). This measure is also a reliable proxy for employment rights, and therefore highly relevant from a legal standpoint. For example, continuous employment is required to qualify for statutory employment rights or to qualify for the right not to be unfairly dismissed (Fudge and Owens, 2006). Furthermore, this is particularly important for the growing pool of atypical workers, especially gig workers, which tend to switch jobs with a high frequency.

As gig workers, an increasing sector of the labour force, are independent contractors,[1] they cannot get fired, but can nevertheless experience high income volatility within a short period of time.[2] This can be due to consumer ratings like in Uber or due to worker ratings or even worker qualification demands like in Mturk (Prassl, 2018). Therefore,

[1] See Prassl (2018) for an in-depth discussion of the rights, status and characteristics of gig workers.

[2] "Before the Internet, it would be really difficult to find someone, sit them down for ten minutes and get them to work for you" (cited in Prassl (2018)).

job tenure captures empirically the risk of job-to-job transitions individuals are exposed to, but also, theoretically, the associated fear of income volatility in the very short term.

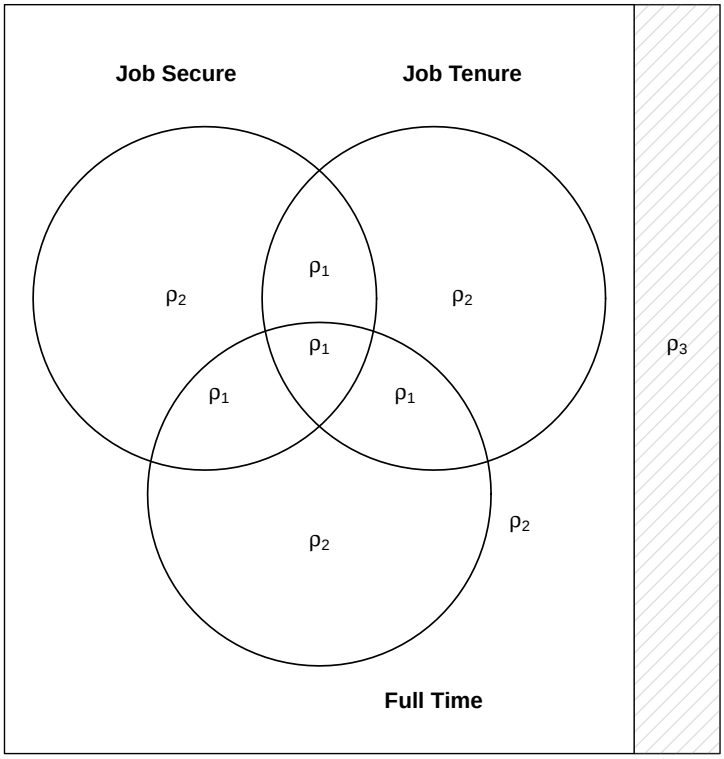
A correct translation of these heuristics into subjective perceptions about vulnerability would imply that the two measures, the subjective and the objective, are both useful. Objective measures should not be redundant to individual subjective biases such as a general worry about the state of the economy. Yet, in cases where the individual's objective insecurity indicators are mixed, the subjective cues are likely to be determinant in the individual's assessment of her economic vulnerability. Because subjective insecurity is likely to capture otherwise unavailable information such as relationship to employer, performance on the job (especially important for gig workers), the use of both subjective and objective measures is therefore a qualitative improvement on work using only subjective or only objective measures.

Based on these considerations, FIGURE II.2 maps the labour force into three groups: those without a job, those employed in a precarious job, and those employed in a secure job, each with a corresponding risk but also employment opportunity. Unlike existing work on labour market dualization, the proposed mapping opens the possibility of non-cooperation between the unemployed (risk ρ_3) and the precarious workers (risk ρ_2). Equally, secure workers (risk ρ_1), although low, do experience labour market risk.

As modern welfare states redistribute income and provide social insurance (Barr, 2001; Alesina and Giuliano, 2011),[3] individuals are not only motivated by redistributive calculations, but also by insurance motives (Moene and Wallerstein, 2001). Compared to the canonical model of Meltzer and Richard (1981) extending the work of Romer (1975) – hereafter, RMR – accounting, in addition, for the inter-temporal nature of people's preferences reveals that even the rich may sometimes support redistribution

[3]The insurance function, or 'piggy-bank' function, arises due to imperfect information, risk and uncertainty in the labour market, and, it is the main reason why individuals cannot adequately privately insurance themselves (Barr, 2001), though see Ansell (2014).

FIGURE II.2: DEFINING RISK TYPE



NOTE *Full-time* denotes the standard binary classification of individuals' contract type based on their contractual working hours (part-time vs full-time). *Job Tenure* captures the number of years an individual is employed with one (and the same) employer, as described in Figure II.C.2. This is represented by a binary classification differentiating those who have continuously worked with the same employer and those who have not. *Job Secure* is represented a binary, distinguishing people who consider their job to be secure from those who consider it insecure. As in any standard Venn diagram, the figure plots logical sets as circles within an enclosing rectangle (the universal set) and common elements of the sets are represented by intersection of the circles.

for purely self-interested reasons.

The two components of insurance models – income and risk – continue to be central here as well. Similar to RMR, an increase in the financial returns of an individual's labour market participation and productivity (pre-tax and transfers income) makes redistributing income less appealing, decreasing her demand for government spending. When, additionally, individuals are uncertain about their future income, they are likely to seek non-market protection. The cost of doing this is the income tax. Regardless of current income, all individuals may be exposed to risk ρ in the labour market.

This implies that risk occurs across the income distribution. Furthermore, this means individuals are risk exposed even if their occupation is not, but because their job is.[4]

Following thus similar assumptions to RMR and insurance models (Alt and Iversen, 2017), the proposed dynamic risk based mapping of the labour market is expected to inform social spending preferences as given by the present value of the following utility function:

$$V = (1 - p_{\rho_i})u[(1-\tau)y_i + \gamma\tau\bar{y}] + p_{\rho_i}u[(1-\gamma)\tau\bar{y}] \tag{II.1}$$

where p denotes the probability of individual i experiencing risk ρ, τ represents the share of income y that gets taxed and $\tau\bar{y}$ is the flat benefit received.[5]

The utility function has the following standard properties: $u'(x) > 0$, $u''(x) < 0$, and $\lim_{x\to 0} u'(x) = \infty$. Under the assumption of a constant relative risk aversion function, this becomes $u(x) = \dfrac{x^{(1-a)}}{1-a}$ $\forall a > 0, a \neq 1$ and $u(x) = ln(x), a = 1$. More specifically, assuming a constant relative risk aversion of unity, equation II.1 can be re-written as:

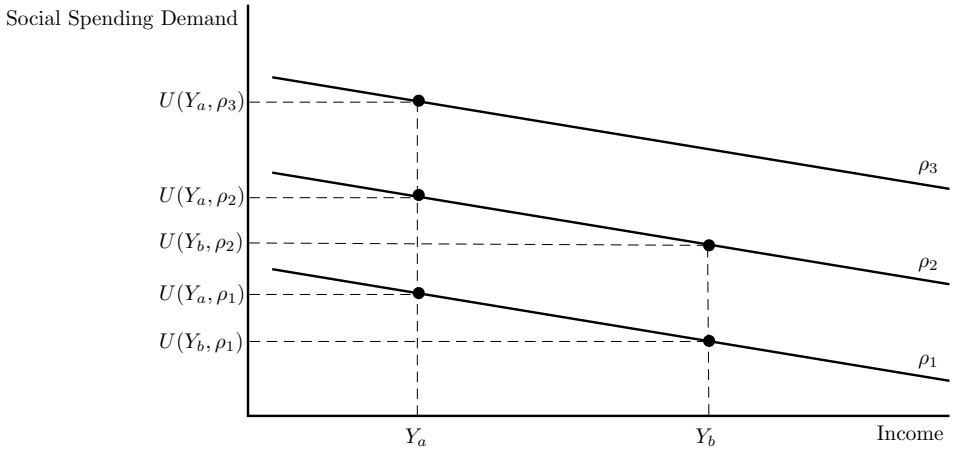
$$V = (1 - p_{\rho_i}) \ln[(1-\tau)y_i + \gamma\tau\bar{y}] + p_{\rho_i} \ln[(1-\gamma)\tau\bar{y}] \tag{II.2}$$

The optimal tax rate is calculated by setting the first order condition to 0 ($\max_\tau V = 0$)

[4]For example, Deliveroo workers have both non-routine and general skill occupations, and are, precariously employed.

[5]Consider n individuals indexed by i where $i \in \{1, 2, ...n\}$. Denote y_i the pre-tax income of each individual i and $\bar{y} = \dfrac{1}{n}\sum_{i=1}^{n} y_i$ the average income in society ($y_1 < \bar{y} < y_n$, meaning some individuals can be considered 'poor' and others 'rich'). For simplicity and parsimony, let the income of the poor be normalized to 0. The government operates a balanced budget, by collecting a linear income tax $\tau \in [0, 1]$ and redistributing a flat-rate transfer, with benefits $(1-\gamma)\tau\bar{y}$ going to the rich and $\gamma\tau\bar{y}$ going to the poor. Let p_{ρ_i} denote a risk-specific probability to become poor and be in need of the $\gamma\tau\bar{y}$ transfer. Regardless of risk, any individual may be rich or poor. It is assumed that, regardless of the income level for any risk category, $p_{\rho_1} < p_{\rho_2} < p_{\rho_3}$, meaning that the risk to become poor (i.e. the probability of losing one's job or a share of one's income) is lowest for those in secure employment (with risk ρ_1).

FIGURE II.3: HYPOTHESIZED RELATIONSHIP



which yields ($\Xi = \frac{y_i}{\bar{y}}$):

$$\tau^* = p_{\rho_i} \cdot \frac{\Xi}{\Xi - \gamma} \tag{II.3}$$

Equation II.3 informs that the optimal tax rate increases with the probability to become poor of the three risk groups, such that $\tau^*_{\rho_1} < \tau^*_{\rho_2} < \tau^*_{\rho_3} \quad \forall y$. Additionally, using the second order conditions, one arrives at the familiar RMR result, in which income is negatively related to the preferred tax level ($\frac{\partial \tau^*}{\partial y} < 0$). These two results are depicted in Figure II.3. In sum, for any given income y, when employment insecurity is high, the opportunity cost of buying further insurance is lower than when unemployment risk is low. Therefore, the individual's risk exposure is expected to adjudicate this trade-off.

Due to sunk costs necessitated by acquiring skills or choosing a skill-specific occupation, alternative risk exposure arguments neglect theoretically the possibility of a change in risk over time, which undermines their likelihood of explaining changes in preferences over time. Empirically, they rely on cross-sectional correlates which makes it impossible to test over time implications.[6] I expect an individual transiting into a more (less) secure job to decrease (increase) her demand for insurance compared to her

[6]Expectations of upward mobility may constitute an exception, though this is less directly related to immediate labour market risk as much as it is related to maximizing lifetime income (Benabou and Ok, 2001; Alesina and la Ferrara, 2005).

time in a less (more) secure job. The main insight in this expectation is that individuals can change their risk by transiting not only into a less secure job, but also into a more secure one. This is a direct consequence of the observation that individuals can switch between jobs at a lower cost than between occupations. Because of this lower cost, individuals can escape precarity. However, they may also experience more frequent switches than they did in the past, especially given the decreasing availability of secure jobs. For example, all net employment growth in the last 10 years in the US was due to the increase in precarious work (Katz and Krueger, 2016). Consequently, investigating over-time transitions and how individuals respond to such changes is important in capturing individuals' responsiveness to changing risk. This is likely to matter most when the individual experiences large changes in her economic circumstances (O'Grady, 2019). Furthermore, investigating the effects of moving in a lower risk category speaks to work exploring individuals' need to insure their investments (Iversen and Soskice, 2001; Moene and Wallerstein, 2001). For example, this literature may expect people who have invested more in their job (e.g. time) to be more likely to insure their investment. I argue instead that such investments (particularly on-job continuation) translate into the individual's job security and, consequently, such individuals should demand *less* rather than *more* redistribution.

II.3 Data and Measurement

To explore empirically the proposed dynamic relationship, individual-level panel data is desirable for three main reasons. First, identifying changes in risk requires detailed information about the individual's current and past experience in the labour market and associated social spending preferences. Second, panel data is preferred to cross-sectional data because it enables modelling time-invariant heterogeneity. Third,

panel data is needed in order to objectively measure job tenure. In addition, a long-run panel is ideal in order to allow the observation of sufficient labour market transitions and subsequent social spending preferences.

To meet these criteria, I employ a long-run panel data following individuals from 1999 to 2014 from Switzerland.[7] The Swiss Household Panel (SHP) is a stratified random sample of private households, representative of the non-institutional resident population in Switzerland (Voorpostel et al., 2016). It started in 1999 and it includes two sample refreshments, one in 2004 and one in 2013. Crucially, the SHP measures social spending preferences as well as perceived job security, contract type and detailed information about each individual's employment history and job characteristics.[8] The sample considered includes only members of the labour force.[9]

In common with most panel-data surveys, attrition may represent a concern to the extent that it is non-random and could thus lead to biased samples. Table II.C.2 explores the individual characteristics of those who take part in only one year compared to those who take part in at least two. A related worry is that individuals decide to take part only in those waves in which they are also relatively well-off from a socio-economic status. While such biases may occur, the sample validity section below estimates the main results with and without those expected to bias the sample.

The dependent variable used in this analysis is captured by the question 'Are you in favour of a decrease or in favour of an increase in federal social spending?'. Potential answers include 'in favour of an increase', 'neither' or 'in favour of a decrease'. Cru-

[7]The economic stability and low unemployment rate in Switzerland could be challenging in this context. The Swiss unemployment rate, while less volatile across time, is often comparable with that of other coordinated or liberal market economies. For example, in 2012, the Swiss unemployment rate was 4.55%, compared to 3.4% in Japan, 4.6% in Germany, 4.3% in Norway (among coordinated market economies), 5.3% in the US and 5.3% in the US (among liberal market economies).

[8]The question on social spending was asked in all years except 2010, 2012, 2013.

[9]Out of the labour force participants – most notably students and discouraged workers – are not considered unless they join the labour force. While these groups may have a sense of the existing risks in the labour market, the prospect of unemployment and income loss is best applied to the active population (Rehm et al., 2012).

cially, the respondents are offered, in addition, the option 'do not know'. This question does not distinguish a redistribution logic from an insurance one. Though many other scholars have previously used such measures (Iversen and Soskice, 2001; Rehm, 2009), it is clear that although serious, the problem is not 'fatal' given that the two preferences are highly correlated (Alesina and Giuliano, 2011). Nevertheless, in two waves, corresponding to the years 2011 and 2014, respondents are asked about several social policy issues, including spending on unemployment benefits. FIGURE II.C.5 shows the positive correlation between demand for federal social spending and unemployment benefits spending. In fact, among those who prefer lower social spending, the majority (almost 60%) also prefer specifically less unemployment benefit spending.

The question asks specifically about federal social spending preferences. Switzerland has been a federal state since 1848. It resembles the US' dual-federalism in that there are clear divisions of power between the federal and the canton level. It is essential thus for respondents to report their desired *federal* spending level rather than the canton ones. Social insurance in Switzerland reveals a story of progressive transfer of power from the canton to the federal level (as happened in Germany or the US). The Federal Constitution of 1874 gave cantons the power to regulate all matters of social policy. Thus, the contemporaneous Swiss system places these responsibilities with the federal government rather than cantons (e.g. unemployment insurance, health and accident insurance, old age and disability insurance) (Noel, 2004; Obinger et al., 2005).[10]

Three questions are used in order to construct the individual-based risk in the labour market. The first, related to individual's perceived job security, asks the respondents

[10]Given the Swiss history as a welfare-state switcher (Esping-Andersen, 1990; Armingeon, 2001), it may be that the 'liberal' face of the Swiss welfare system informs frequent reductions of spending. Consequently, the respondents' demand for higher spending could reflect 'compensating' demands, aiming to revert spending levels to their previous levels. FIGURE II.C.6 reports on the spending levels across the period under observation. Emerging clearly is a stable pattern of spending, with volatilities of less than 8% across the entire period. The dependent variable is validated in a similar manner in O'Grady (2019).

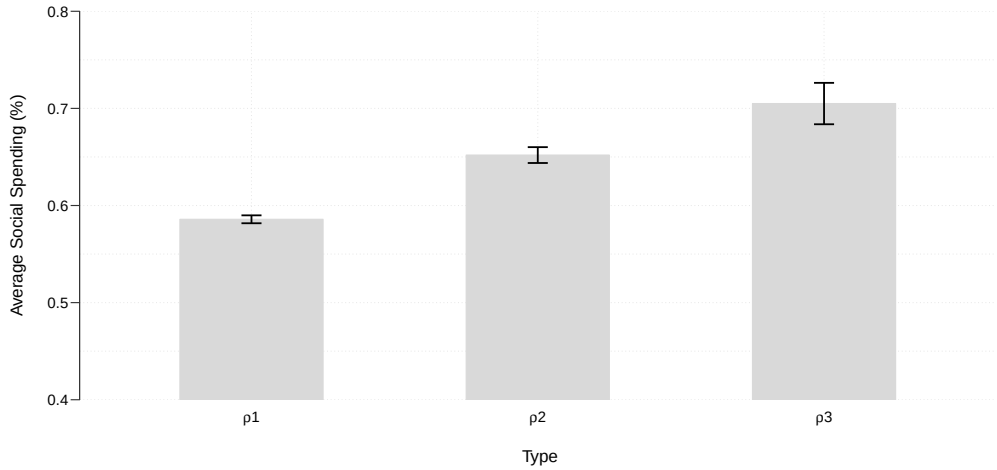
'Would you say that your job is very secure, quite secure, a bit insecure or very insecure?'. Respondents are given four options, based on a four-point Likert item ranging from 'very secure' to 'very insecure'. The question is particularly useful since it avoids creating a mid-point response bias, usually associated with Likert items. The second, straightforwardly asks respondents who are employed whether they are part-time or full-time 'Currently, in your main job, do you work part-time or full-time?'. The third question asks whether the individual has changed her job in the last 12 months, with potential answers being 'yes, only jobs (with the same employer)', 'yes, employers (same job)', 'yes, jobs and employers', 'no, neither jobs nor employers'. This third variable allows the construction of the job continuation measure. Based on these measures, individuals' employment characteristics complying with at least two high risk indicators are classified as experiencing risk ρ_2 and those with at least two low risk indicators are classified with risk ρ_1, as depicted in FIGURE II.2.

As explained theoretically, income emerges as an important factor determining social spending preferences. Income is measured at the household level and is adjusted for the number of household members and their age by employing the OECD-modified equivalence scale (Atkinson et al., 1994; Hagenaars et al., 1994). This measure is equivalent to the cost of living price index: it estimates the ratio between a household's income compared with that of a single individual's income who enjoys the same utility as that household (Browning et al., 2013). By accounting thus for the number of a household's members, this measure avoids under- or over-estimations of the relative wealth of a household or of the relative impact of income shocks for any given household. In order to account for the skewness of the income distribution, the household income is log-transformed. The measurement of other covariates is described in the Appendix.

II.4 Results

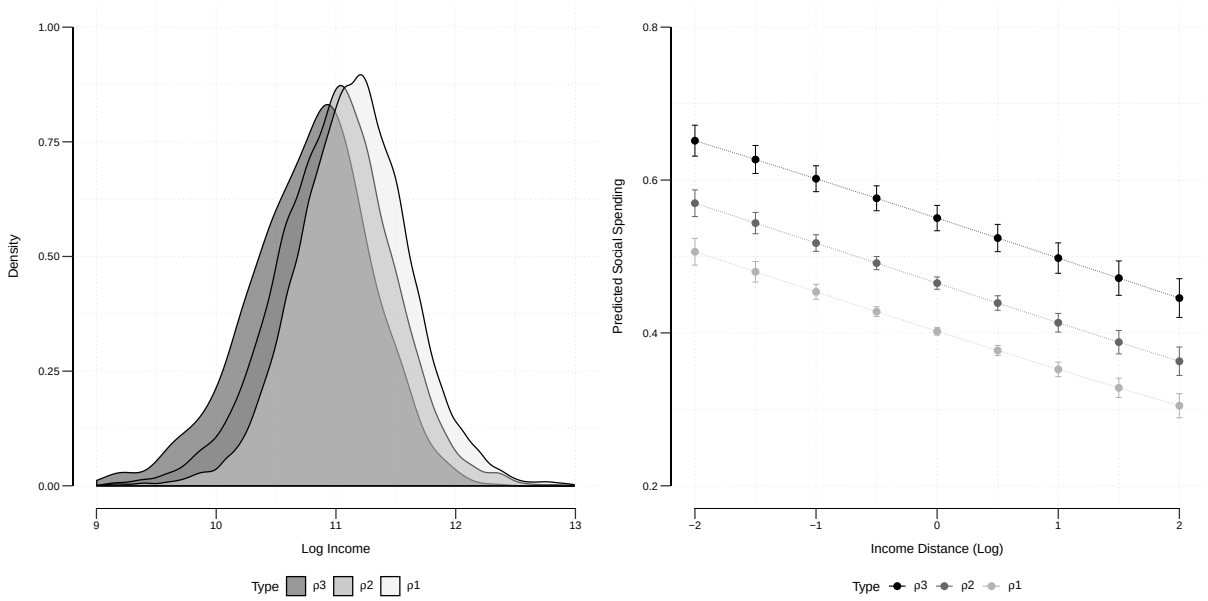
I begin by examining respondents' baseline social preferences informed by their risk type, irrespective of income or other individual characteristics. Based on the theoretical framework, this alone should have an independent effect on spending demand. Figure II.4 reports the preferences among all labour market participants from the pooled sample. Informed only by their associated risk-status, those classified as least exposed to risk, ρ_1, are likely to demand about 7% less spending than those in a precarious job (risk ρ_2) and about 12% less than the unemployed (risk ρ_3). Similarly, there is a sizeable difference between the unemployed and the high-risk workers of about 5%. This reaffirms the importance of accounting for risk, as emphasized in the insurance models. That said, it also tentatively shows that risk can be captured at the individual level, informed by employment status – an individual level measure – rather than occupation. As anticipated, this is crucial for avoiding imputing risk from group level characteristics and being able to infer individual preferences.

Figure II.4: Risk Type and Social Spending



Note: Individuals classified as meeting at least two high risk indicators (i.e. perceived job insecurity, no job tenure or part-time contract) are defined as ρ_2, those with at least two low risk indicators are defined as ρ_1 and those who have been laid off as ρ_3 (see Figure II.2).

FIGURE II.5: SPENDING DEMAND BY INCOME AND RISK TYPE



When accounting for the individuals' position in the income distribution,[11] higher incomes are expected to inform lower support for redistribution. As individuals are expected to be motivated both by redistributive and insurance motivations, their spending preferences are predicted to be decreasing in income and increasing in risk, as anticipated theoretically in FIGURE II.3. As FIGURE II.5 shows, this expectation is largely corroborated empirically.

The left panel plots the income distribution by risk type. Although having a different mean and distribution probabilities,[12] it does appear that the risk associated with employment characteristics occurs *across* the income distribution. This opens the possibility that differences in social spending preferences are only due to an income effect. The right panel though clarifies this is unlikely to be the case. Specifically, for the same income level, secure workers are shown to demand lower spending than the unemployed.

[11]This is captured by the distance between an individual's income and mean income (Meltzer and Richard, 1981).

[12]This is confirmed parametrically by t-tests and non-parametrically by Kolmogorov–Smirnov tests.

Estimation-wise, I follow the existing literature in estimating a pooled model (II.4) that includes controls $\mathbf{X}$ for age, gender, education, civil status and takes the form:

$$SS = \tau_1\rho_1 + \tau_2\rho_2 + \psi Y + \zeta\mathbf{X} + \theta_c + \lambda_t + \epsilon \tag{II.4}$$

This model aims to capture the absolute level of support for the three categorized groups of risks. To this end, TABLE II.1 reports the results for all person-year observations pooled together. All models include time fixed effects (λ_t), capturing the influence of aggregate time trends. Subnational unemployment rates tend to be higher in the French- and Italian- speaking cantons than in the German-speaking ones, which explains the notable different levels of social spending demands. Interestingly, there is quite some variation even within regions speaking the same language. In order to address this issue empirically, models (2)-(5) include canton fixed effects (θ_c).

For ease of interpretation, all models present results of an OLS estimation.[13] The OLS coefficients can be directly interpreted as percentage points change in the dependent variable associated with each covariate.[14]

Model 1 includes only the labour market status and predicts a positive relationship between work type and social spending demand, similar in size to that shown in FIGURE II.4. Models (2)-(4) include additional controls and specifications. As anticipated, secure workers (with risk ρ_1) demand the lowest level of insurance among the three risk groups. In fact, when asked if they would support higher spending, those in a low-risk category report 9 percentage points less spending than the unemployed (with risk ρ_3) and 3 percentage points less than those with a precarious job (with risk ρ_2). Compared to the unemployed, precarious workers demand 6 percentage points less spending. All

[13] Non-linear specifications are reported in Table II.C.6.

[14] A binary outcome is used from model (3) thereafter because it captures best the main theoretical predictions of which individuals specifically desire *'more'* redistribution.

TABLE II.1: POOLED ANALYSIS: RISK AND SOCIAL SPENDING DEMAND

	(1) Ordinal	(2) Ordinal	(3) Binary	(4) Binary	(5) Binary
Risk ρ_2	-0.05***	-0.04***	-0.06***	-0.06***	-0.06***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)
Risk ρ_1	-0.12***	-0.07***	-0.09***	-0.09***	-0.09***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)
HH Income (Log)		-0.03***	-0.04***	-0.04***	-0.04***
		(0.01)	(0.01)	(0.00)	(0.01)
Female		0.08***	0.10***	0.10***	0.10***
		(0.01)	(0.01)	(0.00)	(0.01)
Medium Education		0.02**	0.02**	0.02***	0.02**
		(0.01)	(0.01)	(0.01)	(0.01)
High Education		0.05***	0.03**	0.03***	0.03**
		(0.01)	(0.01)	(0.01)	(0.01)
Married		-0.02**	-0.03**	-0.03***	-0.03**
		(0.01)	(0.01)	(0.01)	(0.01)
Divorced		0.01	0.02	0.02**	0.02
		(0.01)	(0.02)	(0.01)	(0.02)
Age		0.00***	-0.00	-0.00	-0.00
		(0.00)	(0.00)	(0.00)	(0.00)
Constant	0.73***	0.86***	0.88***	0.88***	0.85***
	(0.01)	(0.07)	(0.09)	(0.05)	(0.10)
Year FE	✓	✓	✓	✓	✓
Canton FE	X	✓	✓	✓	✓
Canton-Trend	X	X	X	X	✓
Observations	43,885	43,885	43,885	43,885	43,885
R-squared	0.02	0.07	0.08	0.08	0.09
SE	Clustered	Clustered	Clustered	Bootstrap	$Clustered_h^2$

NOTE: The dependent variable is rescaled to 0 (less spending), .5 (same spending) and 1 (more spending) in models (1) and (2), and as a binary variable with 1 (more spending) and 0 (less or same spending) in models (3)-(5). Standard errors are clustered at the individual level in models (1), (2), (3), at both household and individual levels in model (5) and model (4) reports bootstrap standard errors based on 500 replicates. *** p<0.01, ** p<0.05, * p<0.1.

these effects are statistically significant at the conventional significance level of 5%. Empirically, this shows, unlike the dualization literature, that the unemployed do have distinct preferences compared to the other labour force groups.

As expected, income has a negative effect on demand for social spending. The coefficient predicts that 1 unit increase in the log of income is associated with 3-4

percentage points decrease in spending preferences.[15] Additionally, higher educational attainment, being older or female is likely to make the individual more pro-welfare, while being married is likely to decrease the individual's support for redistribution.

Across the models, I employ different standard error estimations. Models (1)-(3) estimate individual clustered standard errors, bootstrapped standard errors in model (4) and model (5) estimates multi-way individual and household standard errors as suggested in Cameron et al. (2011). In addition, by including canton and year interactions capturing canton-specific trends, this model relaxes the assumption that individuals' spending demand within cantons are time-invariant.

Moreover, I estimate models that account for unobserved individual heterogeneity. When an individual is followed for a lengthy period of time, as here, the unobserved effects could also be interpreted as capturing features of the individual such as motivation or early family upbringing. The very nature of the fixed effects model and the panel data set-up allows the researcher to investigate within individual variation across time. Essentially, such models are equivalent to running regressions taking the differences from the over-time mean for each unit of observation. In other words, if an individual's labour market risk changes across time and this affects her spending preferences, then the estimated coefficients would capture this effect. In this case, the rationale for using individual fixed effects models is twofold: as a robustness check (unobserved individual heterogeneity) for the results in TABLE II.1 and as an estimation procedure to explore the dynamic relationship between personal economic circumstances and spending preferences.

Equation II.5 describes the model for the individual fixed effects estimation that

[15]The usual perils associated with interpreting the effects of log transformed predictors are applicable here too. Instead, FIGURE II.5 is used to visualize the relationship between income and social spending.

includes time-varying controls $\mathbf{X^*}$. The results are presented in TABLE II.2.

$$SS_{ict} = \tau_1 \rho_{1ict} + \tau_2 \rho_{2ict} + \psi Y_{ict} + \zeta \mathbf{X^*}_{ict} + \xi_i + \theta_c + \lambda_t + \epsilon_{ict} \tag{II.5}$$

As before, the outcome of interest is support for higher levels of social spending. Model (1) fits a linear individual and time fixed effects model which serves, as before, as a reference to the relationship between risk exposure and social spending demands. Model (2) includes canton fixed effects as well as time-variant covariates. The coefficients capturing labour market risk continue to posit a statistically significant relationship between individual-based risk exposure and social spending demand. Given the use of a within-individual estimator, these coefficients inform how, on average, social spending demands compare across different risk exposure categories for a given individual. Therefore, a secure worker (with risk ρ_1) is expected to demand, on average, 4 percentage points less spending than during her unemployment and 3 percentage points less spending than during her time in precarious work.

FIGURE II.6 depicts the expected effect of a change in risk. It complements the results in TABLE II.2 by relying on expectations related to the parallel trends assumption and assumes that preferences of those whose risk changes and those whose risk does not change follows a similar path before the change in risk occurs. Comparing therefore the average change in views of those who transit into risk ρ_1 and those that do not informs about the effect of the change in risk on preferences.

To check for pre-transit trends, I first restrict the sample to the first 5 years of the survey (1999-2004) and to those individuals who are not in secure employment (i.e. the maximum amount of years in which no workers in unemployment or facing unemployment become employed in a low risk job). Second, I keep in this sample only those who have been included in the SHP sample since 1999 (i.e. who did not join in the survey refreshment year 2004 or in another year between 1999 and the refreshment).

TABLE II.2: FIXED EFFECTS ANALYSIS: RISK AND SOCIAL SPENDING DEMAND

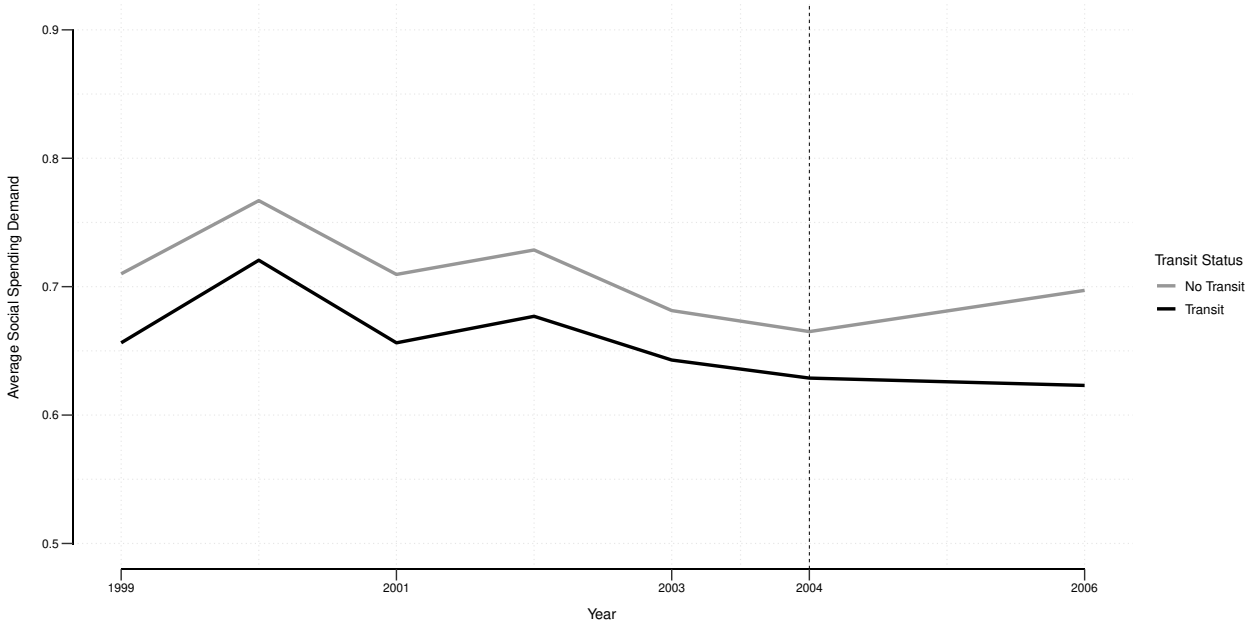
	(1) Social Spending	(2) Social Spending
Risk ρ_2	-0.03**	-0.03**
	(0.01)	(0.01)
Risk ρ_1	-0.04***	-0.04***
	(0.01)	(0.01)
HH Income (Log)		-0.01**
		(0.01)
Individual FE	✓	✓
Year FE	✓	✓
Canton FE	X	✓
Observations	40,809	40,809
Number of ID	7,680	7,680

NOTE: The fixed effects estimations are based on model (3) in Table 1. The sample includes only those who appear at least twice in the survey. The dependent variable is coded as a binary variable with 1 (more spending) and 0 (less or same spending). The second model includes time-variant controls. *** p<0.01, ** p<0.05, * p<0.1.

Third, I allow for an 'intervention' bandwidth of two years, in which the individual can transit into secure employment or not. Finally, FIGURE II.6 plots the means for those who did not transit and those who transited before and after the 'intervention' bandwidth.

What makes these two groups different? TABLE II.C.3 reports the characteristics of those who transit in the pre-transition period. Among them, there are more precarious workers, younger and richer individuals than in the no-transit group. The parallel trend assumption implies that, in the absence of the transit bandwidth, the two groups would have behaved the same as in the pre-transit period. This seems highly likely to hold. As we have noticed, on average, being older, poorer or unemployed makes the individual more likely to demand higher social spending. Therefore, the change in social spending observed after the transit bandwidth (in 2006), based on the parallel trend assumption, may be attributed to the transit into a secure job. Overall, this exercise finds a similar

FIGURE II.6: CHANGES IN RISK EXPOSURE



relationship to the one in TABLE II.2 in that those who transit into secure employment appear to decrease their social spending demands.

II.5 Robustness Checks

Conceptual Validity I argued occupational risk is not homogeneous and that consequently, risk measures inferred from occupational characteristics conceal greater variation in risk and in preferences within each given occupation. FIGURE II.1 already showed some evidence in support of this claim.[16] In addition, I show in TABLE II.C.4 that, once controlling for the proposed risk type classification, existing measures such as skill-specificity or offshoring do not pick up any more variation in spending preferences.

If risk is not homogeneous within occupations, is it within risk types? FIGURE II.C.7 plots the difference between the various combinations of objective and subjective

[16] Additionally, FIGURE II.C.3 reports the distribution of precarious and secure workers within each occupational risk measure.

measures from FIGURE II.2 and estimates their effect on spending demand for precarious (risk ρ_2) and secure (risk ρ_1) workers . The null-effects imply that the groups are indeed homogeneous in their redistribution preferences.

A crucial limitation of most measures is that they cannot account for the possibility that preferences change over time. This is because measures such as skill-specificity, RTI or offshoring do not vary over time and are thus unfit to account for potentially time-variant preferences. This, however, is possible with OUR and the proposed classification, as shown in FIGURE II.C.8 and II.C.9. Comparing how the two measures perform over time, it appears that the proposed classification is superior to OUR, not just conceptually, but also empirically. While both measures pick up variance in risk and preferences over time, the OUR measure bundles together high and risk occupations, making most of them indistinguishable. Also, as the figure notes, occupations with higher unemployment rates, are empirically found to demand just as much or even less spending than more sheltered occupations. By contrast, the three groups proposed in this paper do maintain their differences across time.

Selection Bias The main advantage of the fixed-effects estimation is that it deals with unobserved individual heterogeneity. However, there may be selection on other observables not considered so far that influence social spending and are correlated with the main independent variable. Table II.C.4 reports the robustness of the results following the inclusion of a dummy for the public sector (model 3), union membership (model 4), Goldthorpe-Erikson class schema (model 5), identity (model 6).

Mechanism Validity This paper proposes that three groups can be identified, distinguished by their employment characteristics and with each group having an associated risk level – of unemployment and of (re-)employment. The risk mechanism, similar to that in insurance models, explains welfare state support by relying entirely on individuals' prospects of unemployment. I test the validity of this mechanism against

a placebo outcome, the 'impressionable' year hypothesis, the role of ideology and religion. The results from TABLE II.C.5 discussed in the appendix validate the proposed risk types.

Sample Validity The SHP began in 1999 and included sample refreshments in 2004 and 2013. While the sampled households were selected in these years, this does not imply that all household members (or any, except the head of the household) joined the sample at the same time. This may be problematic insofar as household members joining in non-conventional years may be more labour market volatile (or stable). FIGURE II.C.1 reports the jackknifed estimation of the main results excluding, in ascending order, each household members' non-conventional survey starting year from 2000 up to 2014. I also re-estimate the results based only on those joining the sample in 1999, 2004 or 2013. The results remain robust, even when the estimation is based only on these three years.

II.6 Discussion

This paper has introduced a new approach to evaluating personal labour market risk and its impact on redistribution preferences that addresses two important shortcomings in earlier work. First, previous researchers have assessed this relationship by imputing individuals risk from group-level characteristics. Apart from this, they disagree to which aspect of an occupation matters, and as I have showed, this leads to dramatically different conclusions in terms of who is exposed to risk, and consequently who supports social spending. Second, earlier work assumed the relationship is static in nature and relied on cross-sectional comparisons capturing risk and preferences only at a given point in time. I attempted to obtain a more realistic measure of risk by recognizing an ecological fallacy and by relaxing the assumption that this relationship is static in

nature. Although the method suggested can be applied to measure risk in any system, I focus on Switzerland as this is a very unlikely case for labour market risk to manifest. Using data from a long ran panel data and accounting for unobserved individual level heterogeneity, this paper also has a better claim at causality than previous research.

I argued that although structural changes in the labour market have created labour markets increasingly reliant on precarious jobs, these processes have obvious macro-level industrial and occupational effects, but ultimately impact on job characteristics. I proposed instead a dynamic approach to risk based on employment characteristics. I suggested that high risk is associated with high subjective and objective job insecurity and that these map onto three employment risk types – those in secure jobs, those expecting or likely to lose their jobs and those who have lost their jobs. I extended this framework to the study of redistribution preferences and showed that a dynamic relationship exists and that a change in risk changes redistribution support.

Two main implications regarding aggregate demand for redistribution may be derived. The first concerns the identity of the median voter. Based on labour shares, this paper follows the standard view of occupational-based risk arguments by positioning the median voter as a secure worker. In my framework, the median voter is easily identified as that holding a secure job, whereas this is not clear under alternative explanations, where the occupation of the median voter is not the same across specifications, as FIGURE II.1 set out. Therefore, thinking of public opinion shifts, this framework could provide traction in understanding whose preferences change. A second implication concerns the role of occupations in coalition-formation. If individuals are more likely to perceive risk as clustering alongside types of jobs (secure vs insecure) rather than across macro-societal groups (such as class or occupation), then the lack of a clear structure in organizing individuals' interests is likely to unveil obvious coordination problems, and inference about individuals' support for populist appeals in favour of

the 'forgotten' people. Future research should therefore consider to what extent coordination problems in articulating spending preferences matter and how an increasing pool of highly risk exposed individuals demanding higher taxation but also paying less contributions may affect government budget balance.

Appendix

II.A Data Sources

The main data used in this paper is the Swiss Household Panel. However, other data sources are employed throughout the paper or in the supplementary materials and these are presented in Table II.A.1.

Table II.A.1: Data Sources

Data Type	Data Source
Skill-Specificity	Iversen and Soskice (2001)
Routine Task Intensity	Thewissen and Rueda (2019)
Offshoring	Blinder and Krueger (2013)
Occupational Unemployment Rates	Rehm (2009)
Public Social Spending (% GDP)	OECD Social Expenditure Database

II.B Survey items used in the analysis

The survey items used for the dependent variable and the main independent variable are explained in the Data & Measurements section of the paper. An additional number of covariates are employed based on theoretical considerations of their likely effect on social spending. I explain their relevance and how they are measured below.

Gender – A gender dummy (1=female) is considered, based on theoretical expectations that women, since the transition from the 'traditional gender gap' to the 'modern

gender gap' are generally more left-wing leaning and supportive of redistribution (Inglehart and Norris, 2003; Edlund and Pande, 2002; Abendschön and Steinmetz, 2014). Also, women were found to perceive the economy as performing worse than it actually does and could demand more social spending on that basis, compared to men (Chaney et al., 1998).

Education could be considered a proxy for individual's skills. Based on respondents' highest achieved educational level (measured by years of education), they are grouped into a 'low education' category if they do not hold a high-school degree (reference group), a 'medium education' category if they hold a high-school degree or similar qualification, and those who finished tertiary education are grouped in the 'high education' category. Based on the SBTC, higher educational attainment should be associated with lower demands for redistribution – as expected in Rehm (2009); Thewissen and Rueda (2019). Others find that higher educational attainment is associated with more pro-welfare attitudes (Margalit, 2013) or that there are no differences between high and low skilled workers in sheltered industries (Walter, 2017). At the same time, higher educational attainment is associated with higher support for left-wing parties (Rueda, 2018). Therefore, it is unclear what the expectation regarding educational attainment should be. On the one hand, higher skills may act as insurance against risk. On the other hand, labour market risk may occur across the skill distribution – also suggested in Katz and Krueger (2016).

Civil status is often excluded from analyses, though many scholars have identified its importance in determining an individual's welfare preferences (Iversen and Rosenbluth, 2006; Armingeon, 2006; Svallfors, 1997; Edlund and Pande, 2002). The expectation is that people who have just divorced (or are expected to divorce) suffer an income shock on a personal level. Even if their personal income does not necessarily decrease, the fact that many common household expenses are no longer shared between partners makes

the individuals feel poorer in relative terms. On the other hand, married people are expected to demand less because often times the partner's income acts as a buffer in case of a personal income shock (such as unemployment). This variable is thus coded as a categorical variable with three categories: 'single' (the reference category), 'married' and 'divorced'.

Age (measured in years) is expected to be positively correlated with support for redistribution, meaning that older individuals are generally found to be more supportive of social spending.

II.C Survey Supplementary Materials

II.C.1 Sample Descriptives

TABLE II.C.1: SUMMARY STATISTICS

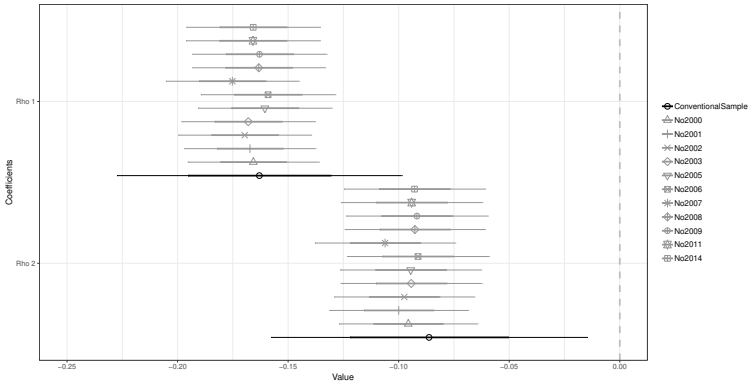
	Mean	**SD**	**Min**	**Max**
Social Spending (Ordinal)	.60	.39	0	1
Social Spending (Binary)	.42	.49	0	1
Risk Level ρ_2	.18	.38	0	1
Risk Level ρ_1	.79	.41	0	1
Household Income (log)	11.11	.51	6.91	14.54
Age	41.85	13.14	16	96
Medium Education	.48	.50	0	1
High Education	.38	.49	0	1
Married	.57	.50	0	1
Divorced	.12	.32	0	1

TABLE II.C.2: CHARACTERISTICS OF RESPONDENTS BY NUMBER OF CONTACT

	(1) 1 Contact	(2) ≥ 2 Contacts
Social Spending	.58	.60
Risk ρ_2	.25	.18
Risk ρ_1	.69	.80
HH Income (Log)	10.97	11.11
Female	.50	.45
Medium Education	.43	.48
High Education	.24	.39
Married	.39	.58
Divorced	.10	.12
Age	35.6	42.3

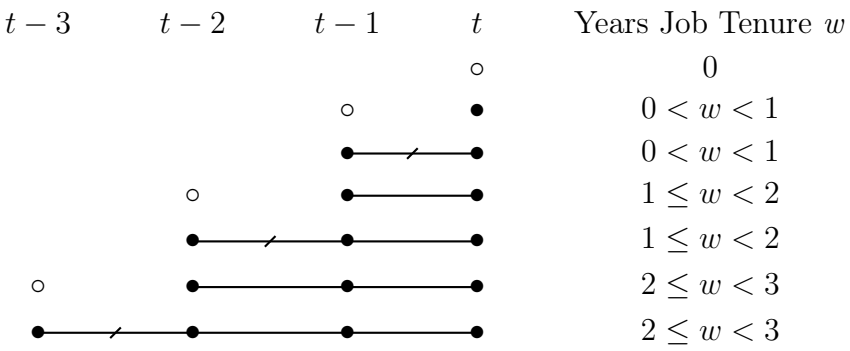
Note: The summary statistics represent either means or percentages. Attrition in SHP between the first two waves (10%) is similar to other panel studies such as SOEP (10%) or PSID (12%) (Fitzgerald et al., 1998; Kroh and Spieß, 2005; Burton et al., 2006).

FIGURE II.C.1: JACKKNIFE SAMPLE



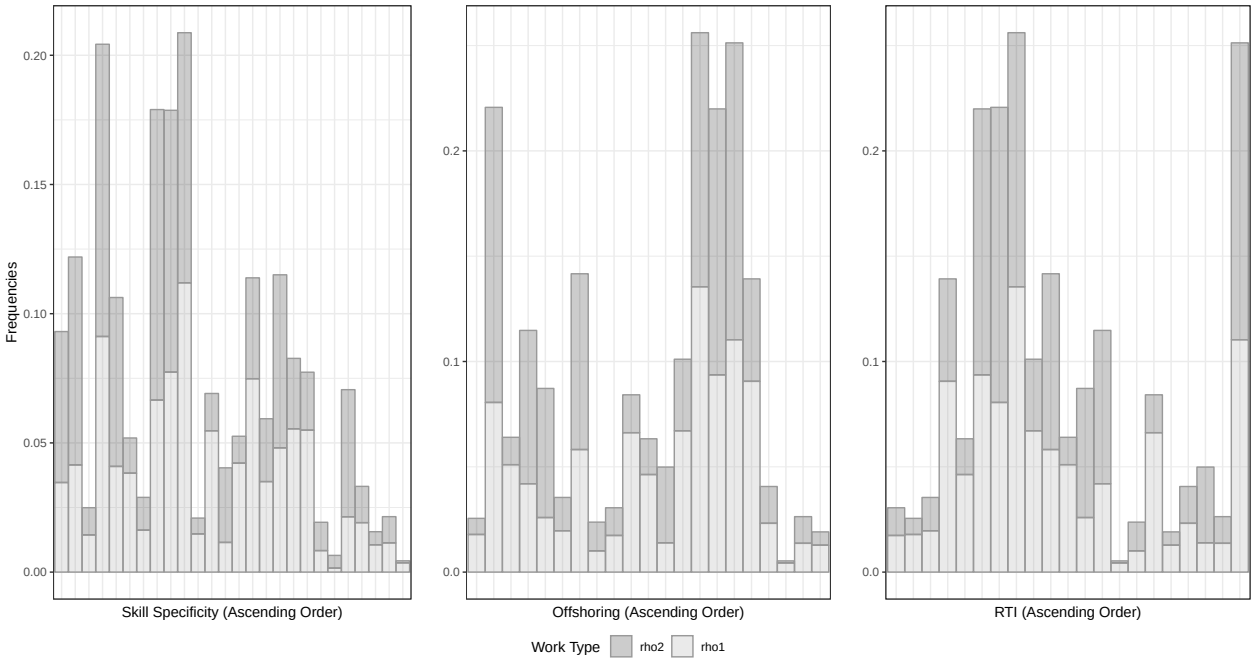
II.C.2 Risk Type Descriptives and Correlates

FIGURE II.C.2: DEFINING JOB TENURE



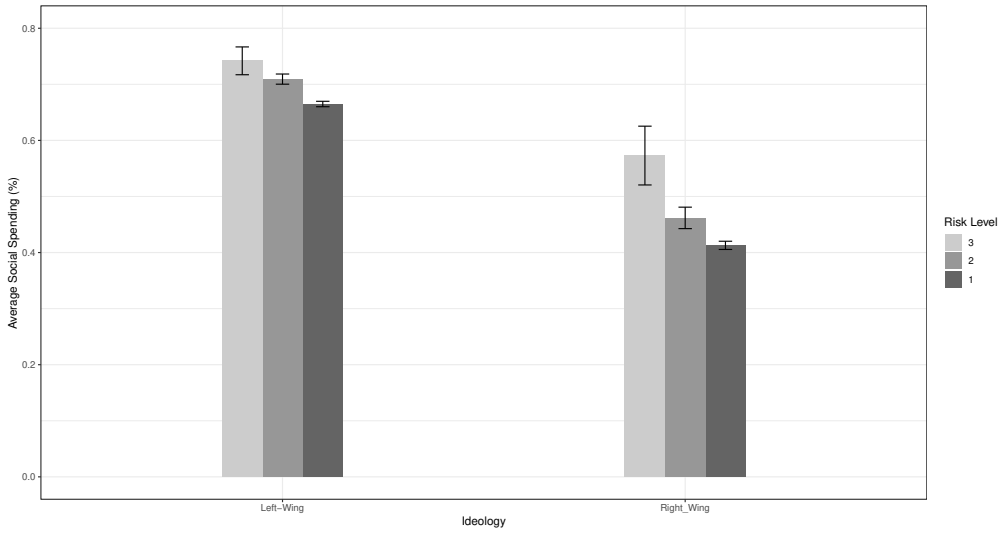
NOTE: This is an illustration covering 4 time periods. Pattern generalization is possible for n time periods. Black circles represent employment. White circles represent unemployment. Horizontal lines represent continuation of work in the same job, while interrupted horizontal lines represent a change of job between two adjacent years. Following OECD data on average job tenure, I base the cut-off for the binary variable on two-year continued work within the same job.

FIGURE II.C.3: DISTRIBUTION OF ρ_1 AND ρ_2 IN SKILL SPECIFIC, OFFSHORE, RTI



NOTE: The y-axis captures the percentage of secure and precarious workers within each available ISCO-2 occupation. On the x-axis, occupations are ordered based on their skill specificity, offshoring index or RTI, such that on the left of each graphs' x-axis, the occupation with the smallest index is plotted. The figure clearly points to the sizeable variation of employment characteristics within each occupation.

FIGURE II.C.4: RISK AND IDEOLOGY



II.C.3 Additional Results

Figure II.C.5: Unemployment Spending and Social Spending

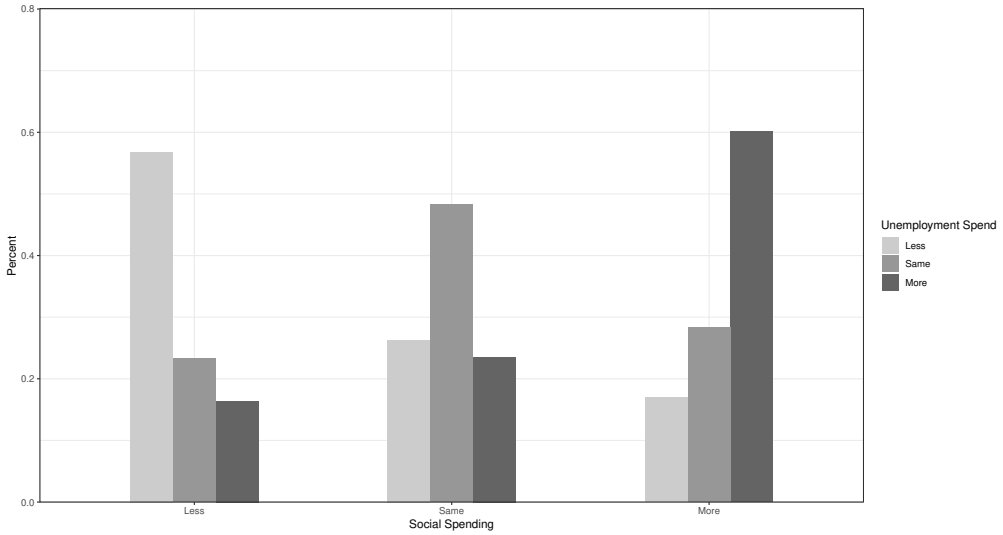


Figure II.C.6: Public Swiss Social Spending (%GDP)

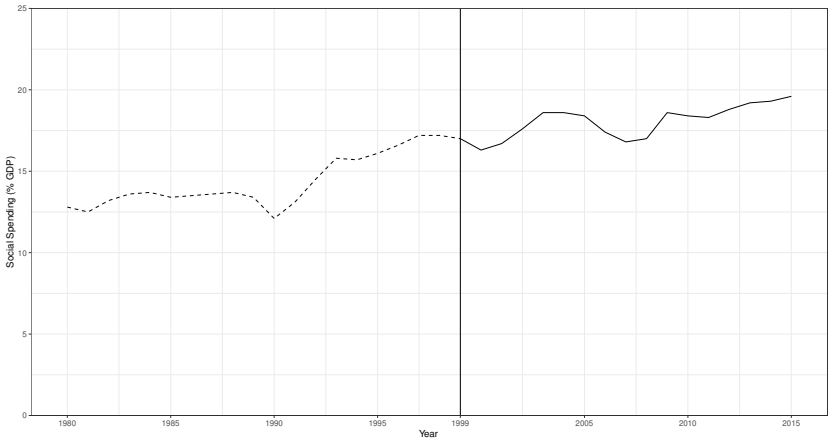


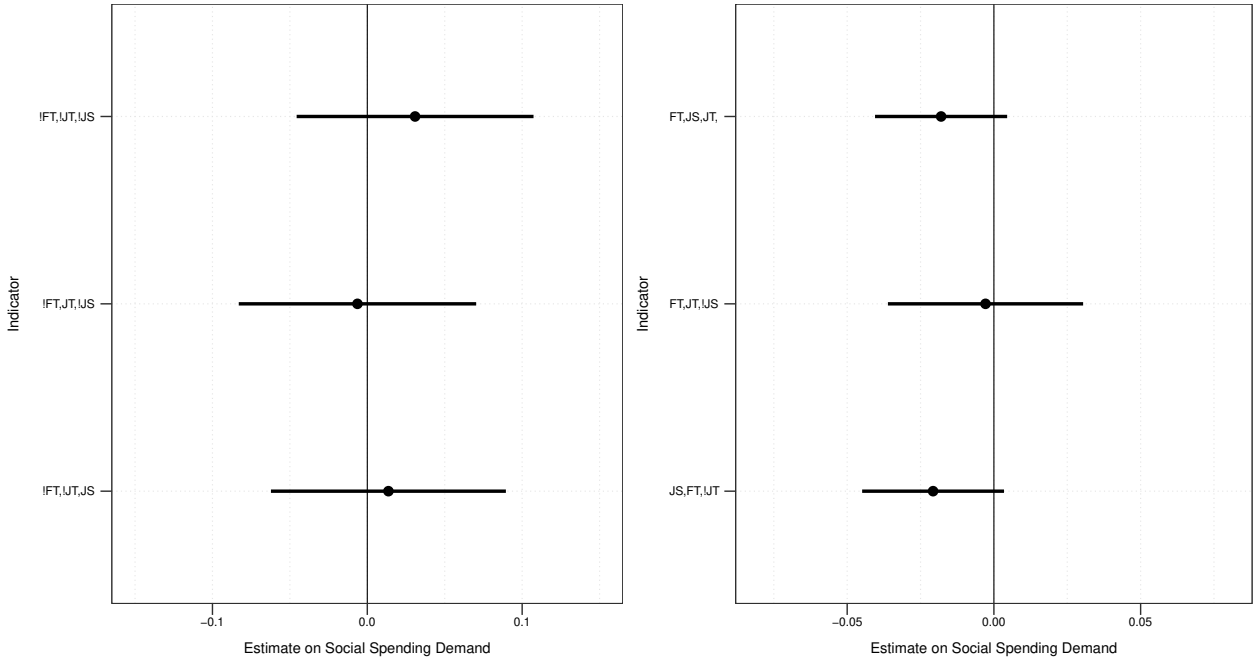
TABLE II.C.3: CHARACTERISTICS TRANSIT AND NO-TRANSIT GROUPS

	Mean Age	Mean Income	% Risky
Transit	43.0	57,529	92%
No Transit	43.9	53,447	81%

TOTAL OBSERVATIONS: 1,400 (848 NO TRANSIT, 552 TRANSIT)

II.C.4 Robustness Reporting

FIGURE II.C.7: ROBUSTNESS WITHIN RISK TYPE



NOTE: The left panel defines ρ_2 as in FIGURE II.2 – i.e. based on the combination of objective and subjective indicators – and shows null effects, meaning that there is homogeneity within the group in terms of social spending demand. The right panel defines ρ_3 as explained in FIGURE II.2 and also confirms that the group is homogeneous with respect to its redistribution demand.

FIGURE II.C.8: SPENDING DEMAND BY RISK TYPE OVER TIME

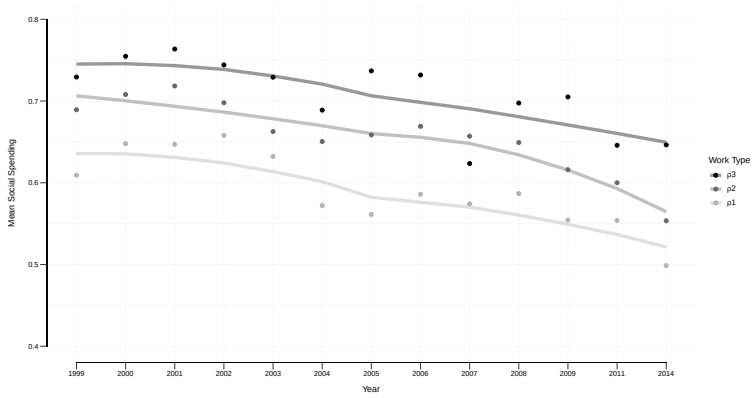
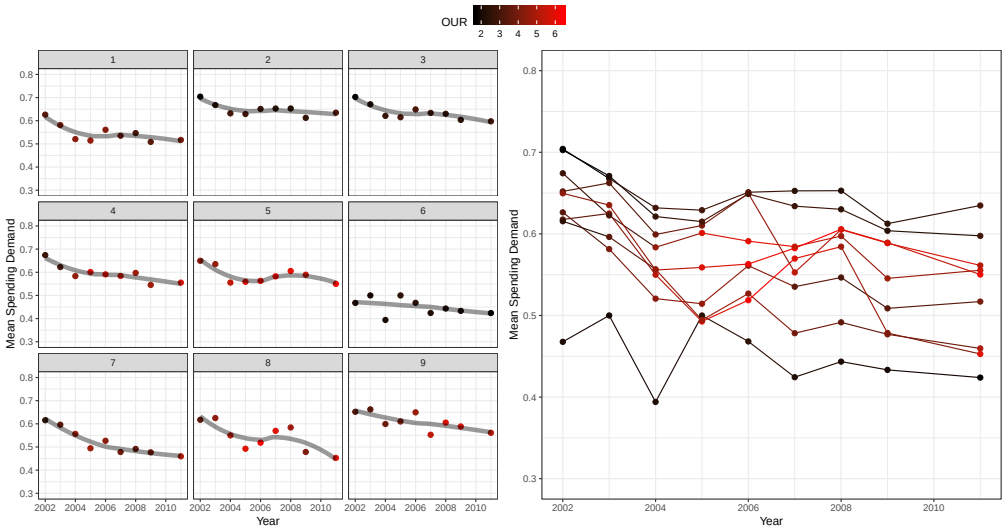


FIGURE II.C.9: SPENDING DEMAND BY OUR OVER TIME



NOTE: The left panel is presenting the smoothed over-time variance of OUR by ISCO-1. Darker colours imply lower unemployment risk. Similar inform is conveyed on the right panel, where each line represents an ISCO-1 group. While OUR does capture variance within each ISCO-1 (left-panel), it becomes clear that occupations are not distinguishable in their risk at each point in time, and, even more that high exposed occupations are not the ones demanding, on average, most social spending (right panel). This is by contrast to results in FIGURE II.C.8 that shows great support for the proposed measure.

I test the validity of the proposed mechanism against a placebo outcome, the 'impressionable' year hypothesis, the role of ideology and religion. I use the proposed work classification to test whether it significantly affects individuals' support for unrelated policy domains such as nuclear energy spending. If risk exposure were not the mechanism linking the individual's labour market status to insurance demands, then one may expect differences among individuals also with respect to such policies. The null results reported in model (1) validate the mechanism.

Based on numerous accounts, individuals' preferences are considered most volatile during their socialization period or 'impressionable' years (Sears, 1981). This opens the possibility that the identified differences in preferences are driven by the youth in the sample rather than by the individuals' risk exposure. Following the trajectory of attitudinal stability presented in Dinas (2013), I restrict the sample to those over 25 years old (model 2) and to those over 45 years old (model 3), corresponding to proba-

TABLE II.C.4: CONCEPTUAL VALIDITY AND OTHER OBSERVABLES

	(1) Social Spending	(2) Social Spending	(3) Social Spending	(4) Social Spending	(5) Social Spending	(6) Social Spending
Risk ρ_2						-0.05***
						(0.02)
Risk ρ_1	-0.03***	-0.03**	-0.02**	-0.04***	-0.03***	-0.08***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Skill-Specificity	0.00					
	(0.00)					
Offshoring		-0.00				
		(0.01)				
Public Sector			0.06***			
			(0.01)			
Union Member				0.08***		
				(0.01)		
Goldthorpe II					0.07***	
					(0.01)	
Goldthorpe III					0.02*	
					(0.01)	
Goldthorpe IV					-0.06***	
					(0.02)	
Goldthorpe V					0.06**	
					(0.02)	
Goldthorpe VI					0.01	
					(0.02)	
Goldthorpe VII					-0.01	
					(0.01)	
Foreigner						0.10***
						(0.01)
Constant	0.81***	0.86***	0.91***	0.84***	0.85***	0.84***
	(0.09)	(0.11)	(0.10)	(0.09)	(0.09)	(0.09)
Observations	41,033	33,724	32,576	42,659	41,957	43,876
R-squared	0.08	0.08	0.08	0.08	0.08	0.08

Note: Results based on Model (3) in Table 1. Only those employed are naturally considered in models (1)-(5). Precarious workers constitute the reference group. *** p<0.01, ** p<0.05, * p<0.1.

bilities of less than .5 and .05 of an attitude change. Therefore, the chosen cut-offs (25 and 45 years old) seem to capture only individuals who have passed the 'impressionable

years' and reached political maturity. The estimates suggest that including only adults who have reached attitudinal stability does not affect the results, which remain highly statistically significant.

The individuals' prior beliefs proxied by her ideology may instead determine who is supportive of the welfare state, rather than her labour market insecurity – (see, Jæger (2008)). Although the left-right self-placement represents a likely determinant of welfare preferences (model 4), this does not however nullify the significance and thus the validity of the proposed mechanism. Given that the present argument does not posit a mono-causal argument in which labour market risk is the *only* determinant of social spending support, it is therefore compatible with the significance of the individuals' prior political beliefs. While it is nevertheless true that there is a noticeable gap among left-wing and right-wing partisans (Figure II.C.4), both groups respond to changes in risk, perhaps even more so among right-wingers.

An individuals' religiosity may act as an alternative insurance mechanism to adverse life events (such as job loss) (Scheve and Stasavage, 2006). The proposed mechanism and results remain robust to the inclusion of this covariate, which similar to the the individuals' prior political beliefs, informs by itself an expected negative relationship with social spending demands – see (Stegmueller, 2013).

TABLE II.C.5: MECHANISM VALIDITY

	(1) Nuclear Spending	(2) Social Spending	(3) Social Spending	(4) Social Spending	(5) Social Spending
Risk ρ_2	-0.02	-0.07***	-0.10***	-0.05**	-0.05***
	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)
Risk ρ_1	0.01	-0.08***	-0.12***	-0.06***	-0.08***
	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)
Ideology				-0.07***	
				(0.00)	
Church Attendance					-0.01***
					(0.00)
Constant	-0.10	0.95***	0.99***	1.12***	0.95***
	(0.09)	(0.10)	(0.14)	(0.08)	(0.09)
Observations	42,663	38,317	19,386	39,790	35,883
R-squared	0.08	0.08	0.08	0.17	0.08

scriptsize Note: Results based on Model (3) in Table 1. *** p<0.01, ** p<0.05, * p<0.1.

TABLE II.C.6: NON-LINEAR SPECIFICATIONS: RISK AND SOCIAL SPENDING

	(1) Ordinal	(2) Binary
Risk ρ_2	-0.13***	-0.15***
	(0.04)	(0.04)
Risk ρ_1	-0.24***	-0.23***
	(0.04)	(0.04)
HH Income (Log)	-0.08***	-0.11***
	(0.02)	(0.02)
Female	0.23***	0.27***
	(0.02)	(0.02)
Medium Education	0.07**	0.06**
	(0.03)	(0.03)
High Education	0.16***	0.09**
	(0.03)	(0.03)
Married	-0.07**	-0.07**
	(0.03)	(0.03)
Divorced	0.02	0.06
	(0.04)	(0.04)
Age	0.00***	-0.00
	(0.00)	(0.00)
Constant cut1	-1.64***	
	(0.21)	
Constant cut2	-0.60***	
	(0.21)	
Constant		1.05***
		(0.24)
Time FE	✓	✓
Canton FE	✓	✓
Observations	43,885	43,885

Note: The dependent variable is rescaled to 0 (less spending), .5 (same spending) and 1 (more spending) in model (1). It is coded as a binary variable with 1 (more spending) and 0 (less or same spending) in model (2). Standard errors are clustered at the individual level. *** p<0.01, ** p<0.05, * p<0.1.

References

Abendschön, Simone and Steinmetz, Stephanie (2014). The Gender Gap in Voting Revisited: Women's Party Preferences in a European Context. *Social Politics*, 21(2):315–344.

Ahlquist, John, Copelovitch, Mark, and Walter, Stefanie (2020). *The Political Consequences of Economic Shocks: Evidence from Poland*. American Journal of Political Science.

Alesina, Alberto and Giuliano, Paola (2011). Preferences for Redistribution. In Benhabib, J, Bisin, A, and Jackson, M, editors, *Handbook of Social Economics*. San Diego:North-Holland.

Alesina, Alberto and la Ferrara, Eliana (2005). Preferences for Redistribution in the Land of Opportunities . *Journal of Public Economics*, 89(5-6):897–931.

Alt, James and Iversen, Torben (2017). Inequality, Labor Market Segmentation, and Preferences for Redistribution. *American Journal of Political Science*, 61(1):21–36.

Ansell, Ben (2014). The Political Economy of Ownership: Housing Markets and the Welfare State. *American Political Science Review*, 108(2):383–402.

Armingeon, Klaus (2001). Institutionalising the Swiss Welfare State. *West European Politics*, 24(2):145–168.

Armingeon, K (2006). Reconciling Competing Claims of the Welfare State Clientele. In Armingeon, K and Bonoli, G, editors, *The Politics of Post-Industrial Welfare States*, pages 100–122. London: Routledge.

Atkinson, Anthony, Rainwater, Lee, and Smeeding, Timothy (1994). Income Distribution in European Countries. *Luxembourg Income Study Working Paper 121*.

Autor, David H, Levy, Frank, and Murnane, Richard J (2003). The Skill Content of Recent Technological Change: An Empirical Exploration. *The Quarterly Journal of Economics*, 118(4):1279–1333.

Barr, Nicholas Adrian (2001). *The Welfare State as Piggy Bank: Information, Risk, Uncertainty, and the Role of the State*. Oxford University Press.

Benabou, Roland and Ok, Efe (2001). Social Mobility and the Demand for Redistribution: the Poum Hypothesis. *The Quarterly Journal of Economics*, 116(2):447–487.

Blinder, Alan and Krueger, Alan (2013). Alternative Measures of Offshorability: A Survey Approach. *Journal of Labour Economics*, 31(2):97–128.

Browning, Martin, Chiappori, Pierre-Andre, and Lewbel, Arthur (2013). Estimating Consumption Economies of Scale, Adult Equivalence Scales, and Household Bargaining Power. *Review of Economic Studies*, 80:1267–1303.

Burgoon, Brian and Dekker, Fabian (2010). Flexible employment, Economic Insecurity and Social Policy Preferences in Europe. *Journal of European Social Policy*, 20(2):126–141.

Burton, J, Laurie, H, and Lynn, P (2006). The Long-Term Effectiveness of Refusal Conversion Procedures on Longitudinal Surveys. *Journal of Royal Statistics Society, Series A (Statistics in Society)*, 169(3):459–478.

Cameron, Colin, Gelbach, Jonah, and Miller, Douglas (2011). Robust Inference with Multi-way Clustering. *Journal of Business and Economic Statistics*, 29(2).

Chaney, Carole Kennedy, Alvarez, R Michael, and Nagler, Jonathan (1998). Explaining the Gender Gap in US Presidential Elections 1980-1992. *Political Research Quarterly*, 51:311–339.

Codagnone, Cristiano, Abadie, Fabienne, and Biagi, Federico (2016). The Future of Work in the 'Sharing Economy': Market Efficiency and Equitable Opportunities or Unfair Precarisation? *Institute for Prospective Technological Studies, JRC Science for Policy Report EUR 27913 EN.*

Cusack, Thomas, Iversen, Torben, and Rehm, Philipp (2006). Risks at Work: The Demand and Supply Sides of Government Redistribution. *Oxford Review of Economic Policy*, 22(3):365–389.

Davis, Steven J and Von Wachter, Till M (2011). Recessions and the Cost of Job Loss. *National Bureau of Economic Research.*

Dinas, Elias (2013). Opening "Openness to Change": Political Events and the Increased Sensitivity of Young Adults. *Political Research Quarterly*, 66(4):868–882.

Edlund, Lena and Pande, Rohini (2002). Why Have Women Become Left-Wing? The Political Gender Gap and the Decline in Marriage. *The Quarterly Journal of Economics*, 117(3):917–961.

Esping-Andersen, Gosta (1990). *The Three Worlds of Welfare Capitalism.* Cambridge: The Polity Press.

Fitzgerald, John, Gottschalk, Peter, and Moffitt, Robert A (1998). An Analysis of Sample Attrition in Panel Data: The Michigan Panel Study of Income Dynamics. *Human Resources: Special Issue: Attrition in Longitudinal Surveys*, 33:251–299.

Fudge, Judy and Owens, Rosemary (2006). Precarious Work, Women and the New Economy: The Challenge to Legal Norms. In Fudge, Judy and Owens, Rosemary, editors, *Precarious Work, Women, and the New Economy.* Oxford: Hart Publishing.

Funke, Manuel, Schularick, Moritz, and Trebesch, Christoph (2016). Going to Extremes: Politics After Financial Crises, 1870–2014. *European Economic Review*, 88:227–260.

Gingrich, Jane and Ansell, Ben (2012). Preferences in Context: Micro Preferences, Macro Contexts, and the Demand for Social Policy. *Comparative Political Studies*, 45(12):1624–1654.

Guiso, Luigi, Herrera, Helios, Morelli, Massimo, and Sonno, Tommaso (2019). Economic Insecurity and the Demand of Populism in Europe. Mimeo, University of Bologna.

Hacker, Jacob S (2019). *The Great Risk Shift: The New Economic Insecurity and The Decline of The American Dream*. Oxford University Press.

Hagenaars, Aldi, de Vos, Klaas, and Zaidi, M Asghar (1994). Poverty Statistics in the Late 1980s: Research Based on Micro-data. *Office for Official Publications of the European Communities. Luxembourg.*

Inglehart, Ronald and Norris, Pippa (2003). *Rising Tide: Gender Equality and Cultural Change Around the World*. Cambridge: Cambridge University Press.

Iversen, Torben and Cusack, Thomas R (2000). The Causes of Welfare State Expansion: Deindustrialization or Globalization? *World Politics*, 52(3):313–349.

Iversen, Torben and Rosenbluth, Frances (2006). The Political Economy of Gender: Explaining Cross-National Variation in the Gender Division of Labor and the Gender Voting Gap. *American Journal of Political Science*, 50(1):1–19.

Iversen, Torben and Soskice, David (2001). An Asset Theory of Social Policy Preferences. *American Political Science Review*, 95(4):875–893.

Jæger, Mads Meier (2008). Does Left-Right Orientation have a Causal Effect on Support for Redistribution? Causal Analysis with Cross-sectional Data Using Instrumental Variables. *International Journal of Public Opinion Research*, 20(3):363–374.

Katz, Lawrence F and Krueger, Alan B (2016). The Rise and Nature of Alternative Work Arrangements in the United States, 1995-2015. *National Bureau of Economic Research*.

King, Desmond and Rueda, David (2008). Cheap Labor: The New Politics of "Bread and Roses" in Industrial Democracies. *Perspectives on Politics*, 6(2):279–297.

Kroh, Martin and Spieß, Martin (2005). Documentation of Sample Sizes and Panel Attrition in the German Socio Economic Panel (SOEP) 1984–2004. *Data Documentation 6, DIW Berlin*.

Margalit, Yotam (2013). Explaining Social Policy Preferences: Evidence from the Great Recession. *American Political Science Review*, 107(1):80–103.

Margalit, Yotam (2019). Political Responses to Economic Shocks. *Annual Review of Political Science*.

Marx, Paul and Picot, Georg (2018). Three Approaches to Labor-Market Vulnerability and Political Preferences. *Political Science Research and Methods*, pages 1–6.

Meltzer, Allan H and Richard, Scott F (1981). A Rational Theory of the Size of Government. *Journal of Political Economy*, 89(5):914–927.

Moene, Karle Ove and Wallerstein, Michael (2001). Inequality, Social Insurance, and Redistribution. *American Political Science Review*, 95(4):859–74.

Noel, Alain (2004). *Federalism and Labour Market Policy: Comparing Different Governance and Employment Stragies*. Institute of Intergovernmental Relations: Queen's Policy Studies Series.

Obinger, Herbet, Armingeon, Klaus, Bonoli, Giuliano, and Bertozzi, Fabio (2005). Switzerland: The Marriage of Direct Democracy and Federalism. In Obinger, Herbet, Leibfried, Stephan, and Castles, Francis, editors, *Federalism and the Welfare State: New World and European Experiences*. Cambridge: Cambridge University Press.

OECD (2015). The Labour Share in G20 Economies. *Report prepared for G20 Employment Working Group with Contributions from ILO, OECD, IMG, WB*.

O'Grady, Tom (2019). How do Economic Circumstances Determine Preferences? Evidence from Long-run Panel Data. *British Journal of Political Science*, 49(4):1381–1406.

Prassl, Jeremias (2018). *Humans as a Service*. Oxford: Oxford University Press.

Rehm, Philipp (2009). Risks and Redistribution: An Individual-Level Analysis. *Comparative Political Studies*, 42(7):855–881.

Rehm, Philipp, Hacker, Jacob, and Schlesinger, Mark (2012). Insecure Alliances: Risk, Inequality, and Support for the Welfare State. *American Political Science Review*, 106(2):386–406.

Romer, Thomas (1975). Individual Welfare, Majority Voting and the Properties of a Linear Income Tax. *Journal of Public Economics*, 7:163–188.

Rueda, David (2007). *Social Democracy Inside Out: Partisanship and Labor Market Policy in Advanced Industrialized Democracies*. Oxford University Press.

Rueda, David (2018). Food Comes First, Then Morals: Redistribution Preferences, Parochial Altruism, and Immigration in Western Europe. *Journal of Politics*, 80(1):225–239.

Rueda, David and Stegmueller, Daniel (2019). *Who Wants What?: Redistribution Preferences in Comparative Perspective*. Cambridge University Press.

Scheve, Kenneth and Slaughter, Matthew J (2004). Economic Insecurity and the Globalization of Production. *American Journal of Political Science*, 48(4):662–674.

Scheve, Kenneth and Stasavage, David (2006). Religion and Preferences for Social Insurance. *Quarterly Journal of Political Science*, 1:255–286.

Schwander, Hanna and Hausermann, Silja (2013). Who is in and Who is out? A Risk-Based Conceptualization of Insiders and Outsiders. *Journal of European Social Policy*, 23(3):248–269.

Sears, David (1981). Life Stage Effects upon Attitude Change, Especially among the Elderly. In Kiesler, S, Morgan, J, and Oppenheimer, V, editors, *Aging: Social Change*, pages 183–204. New York: Academic Press.

Stegmueller, Daniel (2013). Religion and Redistributive Voting in Western Europe. *Journal of Politics*, 75(4):1064–1076.

Svallfors, Stefan (1997). World of Welfare and Attitudes to Redistribution: A Comparison of Eight Western Nations. *European Sociological Review*, 13(3):283–304.

Thewissen, Stefan and Rueda, David (2019). Automation and the Welfare State: Technological Change as a Determinant of Redistribution Preferences. *Comparative Political Studies*, 52(2):171–208.

Voorpostel, Marieke, Tillmann, Robin, Lebert, Florence, Kuhn, Ursina, Lipps, Oliver, Ryser, Valérie-Anne, Schmid, Flurina, Antal, Erika, Monsch, Gian-Andrea, and Wernli, Boris (2016). Swiss Household Panel User Guide (1999-2015).

Walter, Stefanie (2017). Globalization and the Demand-Side of Politics: How Globalization Shapes Labor Market Risk Perceptions and Policy Preferences. *Political Science Research and Methods*, 5(1):55–80.

III

The Democrat Disaster: Hurricane Exposure, Risk Aversion and Insurance Demand

Voters' behaviour under uncertainty is fundamental to our understanding of political outcomes. After all, not only are individuals' circumstances highly unpredictable, but so is the very nature of the political process. How citizens respond to heightened risk then represents a question of both theoretical interest and policy relevance. As threats increased in recent decades, the riskiness of an individual's environment has become more salient: financial markets are becoming ever more connected, allowing for systemic economic shocks; workers' security is increasingly under pressure by the rise in use of technology, artificial intelligence and gig work; damages increased due to climate change. A large number of studies document these phenomena, but significantly less research has been successful in understanding how voters respond to hazard. Meanwhile, a great deal is left to be learned about the consequences of risk. For example, ahead of the 2016 US presidential elections, voters were nudged about an increasingly hellish society: "homicides increased, household incomes are down, [the] manufacturing trade deficit has reached an all-time high, attacks on our police, terrorism in our cities, threaten our very way of life."[1]

Whether assuming that voters elect or punish their leaders, recent work in political science and related disciplines expect issues of accountability to surface or distributional

[1] "Donald Trump 2016 RNC draft speech transcript", *Politico*, 21 July 2016

conflict to intensify in response to threats. Across the developing and developed world, myopic voters sanction politicians following exposure to natural disasters, terrorism or rely on heuristics such as partisanship, hawkishness to attribute blame (Achen and Bartels, 2016; Campello and Zucco Jr, 2015; Flores and Smith, 2013; Healy and Malhotra, 2009; Malhotra and Kuo, 2008; Hetherington and Suhay, 2011): "Voters don't choose a president based on how he'll handle disasters, but if they're faced with one, it quickly becomes the most important issue of their lives."[2] Rational voters, on the other hand, faced with higher risks of unemployment, income volatility, sickness, or crime increase their demand for insurance and support for social security (Rehm et al., 2012; Pahontu, 2019; O'Grady, 2019; Hacker, 2019; Rueda and Stegmueller, 2016): "We don't do it to replace the free market, we do it to reduce risk in our society".[3] Yet most studies rely on correlational evidence that ties individuals' self-reported attitudes and preferences to their self-selected educational, labour, housing choices.

In surveys or observational studies, interpreting such correlations causally is challenging. It is empirically hard to separate individuals' exposure to risk from their vote choice as both are associated with individuals' upbringing, human capital stock or demographics.

To circumvent this problem, some studies have relied on exposure to rare, yet appreciable shocks – floods, tsunamis, terrorism, shark attacks. Even then, observed effects represent *compound treatment effects*, partly owed to risk exposure and partly due to experiences of direct loss. A pure risk exposure effect therefore should include *only* variance in risk and not concurrent changes in individuals' circumstances. For a change in behaviour to be attributed to risk, the probability associated with different states of nature needs to change, not the experience of shocks. This paper deals with these empirical challenges by using a natural experiment design relying on temporal

[2] "My Life (Bill Clinton AutoBiography)", 2004

[3] "Remarks by the President [Obama] on Economic Mobility", *The White House*, 4 December 2013

and geographical variation in exposure to hurricanes in the United States.

The randomness of hurricane paths provides exogenous variation in risk exposure within *nearly*-hit disaster high-risk areas. Staggered difference-in-differences estimates allow the comparison of a unit's threat exposure when it is a near-miss with times when it is a more far away miss. The causal estimates then allow me to attribute the change in political outcomes (vote choice) to changes in a unit's exposure to risk. By relying only on the pool of individuals and areas that are *nearly* hit, this study evades potential limitations associated with existing work on risk and voter behaviour (Rehm, 2011; Ahlquist et al., 2020).

I apply this design to the study of risk exposure on outcomes in the United States' House and Senate races between 2002 and 2014. I rely on newly assembled administrative data of longitudinal precinct electoral returns for all disaster high-risk areas and on a novel dataset on historical hurricane tracks from 1851 to 2014. I unveil a "Democrat Disaster": following a unit's near miss, the Democrat vote share decreases in both the House and the Senate, a significant overall electoral penalty for the Democrats.

What explains this counter-intuitive pattern? As Republicans are chief supporters of tax cuts,[4] existing literature expects voters to associate destruction with the need of government spending and provision of public goods – i.e. with Democrat support. I find that conventional explanations related to religiosity, authority, information, or competence fail to explain the increase in Republican support.

Rather, I find that individuals respond to hurricane exposure by intensifying their private insurance inquiries, which subsequently increases their tolerance to risk. Once private insurance is factored in, a two-step process links hurricane exposure to individual

[4] "Coming into power, the Republican leaders faced a choice between tax cuts and providing genuine financing for the future of Social Security. They chose tax cuts. After 9/11, they faced a choice between tax cuts and getting serious about the extensive measures needed to protect this nation against further terrorist attacks. They chose tax cuts. After war broke out in the Mideast, they faced a choice between tax cuts and galvanizing the nation behind a policy of future-oriented burden sharing. Again and again, they chose tax cuts." (cited in Bartels (2005)).

behaviour. First, exposure to risk increases risk-averse behaviour by updating beliefs about the riskiness of the environment. If increasingly risk-averse individuals value their at-risk assets, then their optimal choice is to purchase private insurance. If hit, the damage would impose substantial costs, which is why insurance becomes relatively more expensive. If purchased, this reduces the affordability of existing income tax, given a budget constraint. Relying instead on federally provided assistance such as FEMA becomes less appealing not only because this would not provide the desired type of insurance (e.g. car insurance) but also because this involves a more uncertain process including but not limited to applicant eligibility, which increasingly risk averse individuals do not optimally prefer. Second, assets act as a cushion against economic loss, so asset insurance provides an as-if wealth effect that, as in the traditional Arrow case, reduces relative risk aversion. In sum, these stylized facts explain why voters turn increasingly more to supporters of tax cuts: "What will Congress do? Our [Republican] response is to make those tax cuts permanent".[5] In areas spared from destruction, support for tax cuts then translates into electoral gains for Republicans, who, strangely, benefit from natural disasters. These results are particularly important as United States House and Senate elections occur right after the hurricane season.

In brief, this paper makes four main contributions. First, I provide the first causal estimation of risk exposure's effect on political outcomes. Second, I explore causal mechanisms relating risk and voting and provide an alternative, rational-based, theoretical framework accounting for changes in Democrat support. Specifically, I introduce a largely overlooked, yet crucial, aspect of the decision making process: individuals' tolerance to risk. I discuss this particularly in relation to insurance demand and the trade-off implied by a less uncertain and potentially more comprehensive private-based insurance and reliance on federal assistance supported through income tax. Incorpo-

[5] "Remarks During a Meeting on the National Economy", *Public Papers of the President of the United States, George W. Bush*, 2 June 2008

rating risk aversion into vote choice calculations therefore complicates and enhances the way scholars of American politics and political economy alike conceive of the state-market nexus and interpret elections outcomes in the United States. Third, I present novel empirical evidence on the relationship between natural disasters and electoral outcomes. This contributes to a growing literature on the effects of disasters on incumbent support and blame misattribution (Gasper and Reeves, 2011; Bechtel and Hainmueller, 2011; Malhotra and Kuo, 2008). Finally, this study adds to the broad interpretation of electoral outcomes in the United States – and beyond – as well as the comparative political economy literature. I emphasize the importance of risk exposure and the omission of risk tolerance on our accounts of insurance demand and electoral outcomes, as most disaster high-risk areas are in swing states. Additionally, these theoretical and empirical advances may provide traction on the debate between voter rationality and (spatial) myopia.

III.1 Threats in Context

III.1.1 Polarization

"*I have a rough time wanting to spend billions and billions and trillions of dollars to help people who won't help themselves, won't lift a finger, and expect the federal government to do everything*"

— Senator Hatch [R][6]

"Democrats fight to make sure that Republicans do not turn a guaranteed benefit into a guaranteed gamble"

— Congresswoman Pelosi [D][7]

At least since the New Deal, Democrats and Republicans have been divided by their approach to market intervention, with Democrats widely favouring programs aimed at

[6]"Orrin Hatch Just Made the Republican Agenda Startlingly Clear", *Vox*, 5 December 2017
[7]"Pelosi Statement on the 70th Anniversary of Social Security, *Press Release*, 12 August 2005

helping disadvantaged groups and maintaining, if not increasing, spending levels, while Republicans' appeal consists mostly in their commitment to cutting taxes and reducing spending levels (Petrocik, 1996; McCarty et al., 2016; Jacoby, 2000). As modern welfare states not only redistribute income but also provide social insurance (Barr, 2001), it comes as no surprise that risk is expected to polarize public opinion on optimal spending levels.

A growing literature in political economy emphasizes the role of insurance preferences for vote choice. Insurance models emphasize economic considerations and center around individuals' risk of unemployment, sickness or disability and their need to seek non-market protection to overcome the associated income losses. Those more exposed to such risks are found to be more supportive of increased government spending (Alesina and La Ferrara, 2005; Rueda and Stegmueller, 2019; Rehm, 2009; Iversen and Soskice, 2001; Pahontu, 2019).

Fundamentally, as soon as these models introduce risk in the familiar Meltzer and Richard (1981) model, the debate on "who gets what" is expected to centre around the individuals' likelihood of experiencing a shock. This result, however, relies on two untested premises. First, existing work assumes no path dependence between economic outcomes and related risks (e.g. occupational unemployment rates) *and* prior selection into educational and training paths or unobserved factors such as innate ability or upbringing. Therefore, these models capture empirically risk exposure as well as a non-stochastic part, that of self-selection into treatment. This paper takes an initial step in taking these issues into account. Second, these models assume that citizens have similar risk tolerance and that this is not correlated with income or risk exposure. Yet, as I show below, heterogeneity in willingness to take risks has also a time-variant component, likely to drive changes in voting patterns. This, in part, challenges the above accounts that expect voters to rely entirely on government-provided insurance.

Unlike these predictions, I find that the relationship between risk exposure and vote choice is polarized, but in the opposite direction from what the literature expects: those most risk exposed support Republicans, not Democrats.

III.1.2 Accountability

"You will go to the polls, will stand there in the polling place and make a decision. I think when you make that decision, it might be well if you would ask yourself, are you better off than you were four years ago?"

— Ronald Reagan[8]

Given voters' costly and limited incentive to attend to public affairs (Downs, 1957), retrospective voting offers an efficient alternative of assessing politicians' performance (Kramer, 1971; Key, 1966). Voters' myopia has been signalled problematic and a threat to the democratic ideal insofar as leaders are often punished for events outside their control (Achen and Bartels, 2016).

By far the most developed literature on electoral accountability is that emphasizing voters' retrospective evaluations on economic conditions (Campello and Zucco Jr, 2015; Wolfers, 2002; Duch and Stevenson, 2008; Tertytchnaya and De Vries, 2018), though this relationship often appears mediated by voters' partisanship, knowledge and sophistication (Ansolabehere et al., 2014; Tilley and Hobolt, 2011; Gomez and Wilson, 2006) or even challenged altogether (Healy et al., 2017; Feigenbaum and Hall, 2015; Remmer, 2014).

Recognizing the limitations of correlational estimates and macro-economic evaluations, recent literature has focused on exogenous shocks to voters' circumstances in order to identify a possible accountability effect. Analysing voters' responses to droughts, floods, hurricanes, terrorism and war, or relying on experimental evidence, most findings point to blind retrospection – i.e. the punishment of incumbents (Achen and

[8] "Ronald Reagan's America", Terry Goldway, 2008

Bartels, 2004; Gartner, 2008; Montalvo, 2011; Getmansky and Zeitzoff, 2014; Huber et al., 2012). Even in these situations, consistent evidence emerges against the myopic voter and points instead to information gained (Ashworth et al., 2018).

Retrospective voting serves, at least in part, as a cue of expected future performance. If citizens are faced with a threat, then their judgement of the incumbent is an assessment of her likely performance in a case of a similar (dangerous) situation in the future. If elections serve as opportunities to elect "good types" rather than mechanisms of retribution as evidence from public opinion in the US would suggest (Fearon, 1999), then voters may have a sense of future risk management "When a man votes [...] he makes his decision by comparing future performances he expects from the competing parties" (Downs, 1957, p.39).

Regardless though if voters are myopic or not, this literature is limited in identifying voters' behaviour in response to threats in two ways. First, most events that form the basis of retrospective judgement are non-random. For example, studying blame attribution in response to terrorism is unlikely to produce clean estimates as acts of terrorism are strategic, occurring during key moments across liberal democracies (Pape, 2003). Second, and more importantly, even if the events analysed were as good as random, then the effect identified would not be that of risk, or assessment of performance under risk alone, but rather a *compound treatment effect*. To be sure, the populations studied include those at risk of a threat *and* those who have already incurred direct losses (e.g. natural disaster or terrorism survivors). This observation is crucial because it limits one's ability to infer changes in voting behaviour from changes in threat exposure, without questioning whether the change in individuals' circumstances are the culprit, instead.

III.2 A *Nearly Missed* Design

"We got lucky in Florida – very, very lucky. It was going to be hit directly [...] and it took a right turn."

— Donald Trump[9]

60 million people were at risk to be hit by a hurricane in 2015 in the United States.[10] What is more, only within 7 years (between 2003-2010), hurricanes caused more than 1,377 deaths and more than $235 billion in damages in the US (Blake and Gibney, 2011). It is therefore not surprising that scholars have taken interest in the effects of natural disasters on political outcomes. However, the resultant estimates represent compound treatment effects.

In order to address this issue, identification in this paper comes from exploiting exogenous geographical and temporal variation in the timing and path of hurricanes in the United States. FIGURE III.1 depicts the spatial distribution of hurricane paths that made landfall in continental US between 2003 and 2014 (bottom panel) and an account of each counties' closest distance to hurricane winds within this period (top panel). In the last 15 years, the US was hit by 102 named storms, 20 of which became hurricanes and 8 major hurricanes.[11] Based on historical data, the risk to be affected by a hurricane increases from west to east, with major hurricanes following the East Coast (Blake and Gibney, 2011). Specifically, between 2003 and 2014, the hurricanes cluster in the following states: Alabama, Florida, Louisiana, Mississippi, North Carolina, South Carolina, Texas, Virginia (representing the *population* of disaster high-risk states).

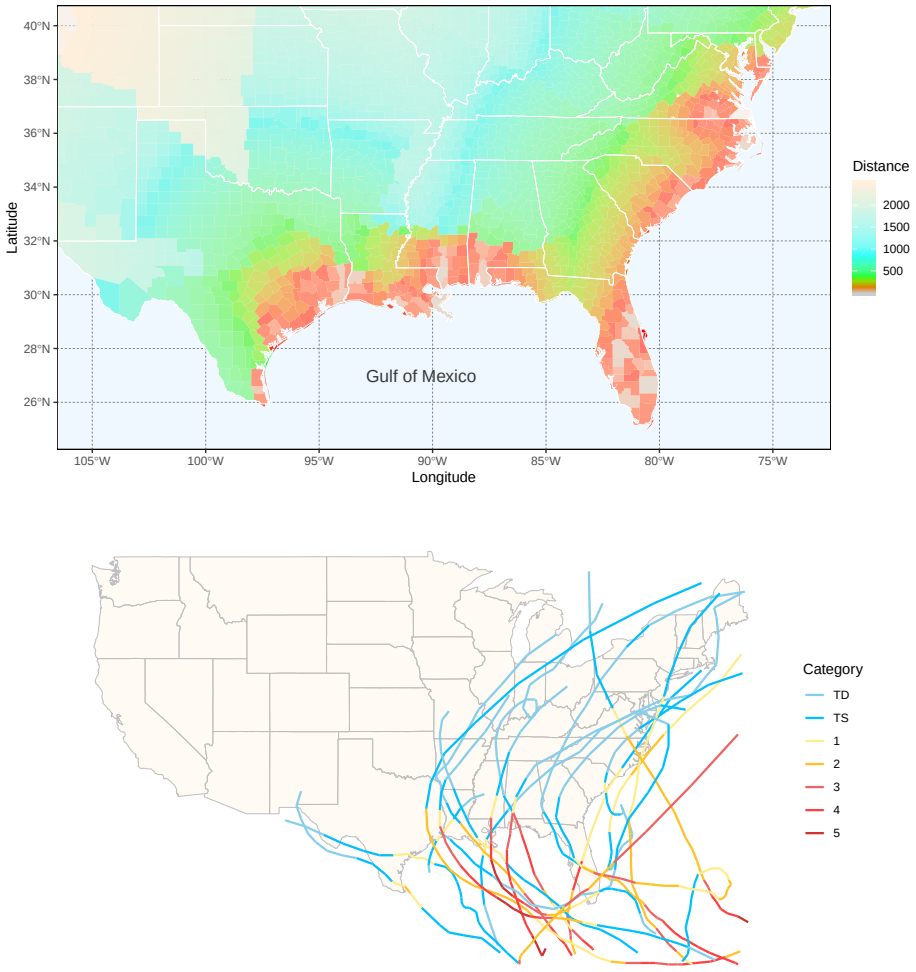
As areas closer to the coast may be different than in-land ones, I use within-state variation at electoral precinct level. I complement this with survey data, geocoded at the zipcode level. As hurricane paths are reported in six-hour intervals, I assume

[9] "Remarks by President Trump in Briefing on Hurricane Dorian", *The White House*, 4 September 2019

[10] "Growth on the Coast", *US Census*, 6 June 2016

[11] Author's own calculations based on NOAA data for the period considered.

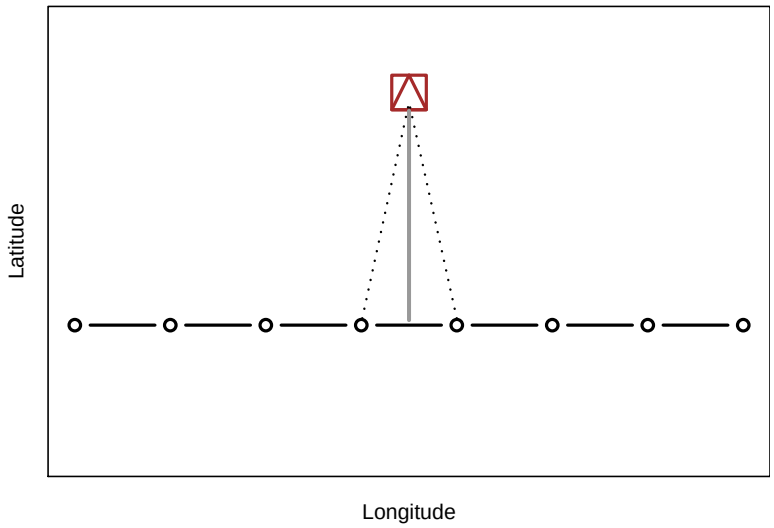
FIGURE III.1: SPATIAL DISTRIBUTION OF HURRICANE PATHS 2003-2014



NOTE: Top panel plots the distribution of hurricanes based on counties' closest distance to a hurricane path. Counties in grey are excluded from analysis (the hit ones). In the bottom panel, the classification of hurricanes' intensity is based on the Saffir-Simpson scale (defined in TABLE III.A.1). The classification of other storm types (TD = Tropical Depression; TS = Tropical Storm) is based on NOAA Glossary. A similar distribution by county is plotted in FIGURE III.A.1.

that the storm path is linear between any two given points and that the wind speed changes smoothly. Each unit's (centroid) shortest distance from a hurricane path is the perpendicular that falls on the hurricane's trajectory, as shown in FIGURE III.2. I follow the consensus in previous literature in choosing a 30 kilometre-radii band to represent the "eyewall" which is the area 30 to 60 kilometres in diameter around the eye of the storm considered to be the one with the strongest winds and heaviest rainfall

FIGURE III.2: DISTANCE CALCULATION UNIT TO HURRICANE PATH



NOTE: The connected black empty circles simulate a hurricane path and the reported latitude and longitude coordinates. The grey solid line represents the shortest distance from a unit to the hurricane path. If this distance falls outside the path, the distance (dotted black line) simply becomes that to the closest point where the hurricane hit.

(Weatherford and Gray, 1988; Karbownik and Wray, 2019; Currie and Rossin-Slater, 2013). Given that many hurricane paths overlap or pass in close proximity to a previous hurricane, a subset of individuals and precincts in the sample are treated by one storm and form part of the control group for individuals or precincts exposed to another storm.[12]

In defining treatment and control groups, I *exclude* units actually hit by hurricanes, who are suffering health shocks or economic losses (individual-level analysis) or that are damaged, flooded, lose electricity or clean water access (precinct-level analysis). Rather, the randomness of the hurricane paths allows me to define treated units as those outside the radius of the hurricane damage, that might have just as well been affected, but were not. Otherwise, including in the treated sample those who have suffered loses or damages would make it inconclusive whether changes in the outcome variable are due to losses/damages or a change in risk exposure. Consequently, the

[12]Further details about hurricane formation and characteristics is reported in SECTION III.A.

treatment is induced risk, rather than by major destruction to property and infrastructure, or temporary displacement from potentially life-threatening natural phenomena. Therefore, τ captures the effect of proximity to a hurricane's path (risk) on vote choice.

I employ several treatment specifications in estimating the quantity of interest: τ.[13] First, I estimate a binary treatment specification as follows:

$$Democrat_{p,t} = \sum_{k} \tau_k D^k_{p,t} + \sum_{p} \alpha_p \text{Precinct}_p + \sum_{t} \lambda_t \text{Year}_t + \epsilon_{1p,t}$$

where D^k is an indicator set to equal one for all treated precincts p in all $k \geq t$ periods, where each treated precinct is defined as:

$$\begin{cases} 1, & \text{if Distance}_{p,t} > 30 \quad \& \quad \text{Distance}_{p,t} \leq j \\ 0, & \text{if Distance}_{p,t} > j \end{cases} \tag{III.1}$$

where j denotes a distance cut-off (e.g. 50km) and $Distance_{p,t}$ denotes the distance from the hurricane path of each precinct p at time t. The resultant specification, often called a staggered difference-in-difference, allows for the treatment to occur at different periods for different precincts.

Second, I employ a continuous treatment specification, $D_{p,t}$, which captures the treatment intensity more gradually than in the binary treatment specification, and I estimate:

$$Democrat_{p,t} = \tau D_{p,t} + \sum_{p} \alpha_p \text{Precinct}_p + \sum_{t} \lambda \text{Year}_t + \epsilon_{2p,t}$$

where $D_{p,t} = \text{Distance}_{p,t}$ for all $k \geq t$ periods and 0, otherwise.

The key identification assumption that allows the interpretation of τ as a causal

[13] Across estimations, I differentiate the effect of proximity to hurricane by the intensity of the exposure itself, captured by a hurricane' winds as defined on the Saffir-Simpson scale in TABLE III.A.1.

effect is that, in the absence of a unit's near miss, the Democrat vote share in that unit would have followed a similar pattern as a control unit over time. Graphically, this assumption is testable with the parallel trend. More substantively, the implication is that there are no time-varying confounders. I explore the robustness of the estimates to several potential time-varying covariates including population movements, partisan and turnout changes.[14]

III.3 Data

This paper links newly assembled longitudinal precinct-level election results to newly collected spatial data on hurricane tracks to study the effects of exposure to risk. Each precinct is followed from 2002 to 2014. I complement the precinct-level estimation with individual-level data on risk aversion and with Google Trends data on insurance demand among the American public. In total, five categories of datasets are used in this paper: (i) National Hurricane Centre NOAA spatial data on hurricane tracks, (ii) administrative longitudinal precinct-level election results, (iii) the Cooperative Congressional Election Study (CCES) for cross-sectional information on individual demographics, risk aversion, political preferences and residence (zipcode level) and the Health and Retirement Study (HRS) for panel data on individual demographics, risk aversion and residence (zipcode level), (iv) Google Trends insurance-related searches, (v) newly collected or linked administrative data on voter turnout, partisanship, geographical correspondences and crosswalks.

[14]The results are reported in FIGURE III.B.3, III.B.4, III.B.5, III.B.6, III.E.2, III.E.3.

III.3.1 Data on Storms and Hurricanes

Data on hurricanes and severe storms comes from the National Oceanic and Atmospheric Administration (NOAA). Starting 1848, NOAA records all hurricanes or storms' names, their nature, wind speed and daily latitude and longitude coordinates of their path. Of interest are storms that formed in the North Atlantic basin and I use all hurricanes that made landfall in the United States between 2003 and 2014. The resulting cases considered in this paper are presented in TABLE III.A.2 and I document the intensity of their within-state distribution in FIGURE III.A.1. In order to test whether future hurricanes affect current political outcomes I rely on hurricanes that made landfall in the US after 2014: hurricane Matthew and Hermine that both made landfall in 2016. They are described in TABLE III.A.3 and III.A.4.

III.3.2 Election Results Data

To measure electoral returns I rely on information collected from the most granular administrative level – electoral precinct. The average precinct is about ten times *smaller* than a congressional district and has an average of 800 voters (compared to the average congressional district of 720,000 voters), although precincts tend to vary considerably in terms of geographical size and population density (Amos et al., 2017; Webb, 2014). The impressive granularity of the data and its administrative nature should therefore be considered superior to its survey, self-reported based vote intention counterpart.

In constructing the electoral returns data, I use all available election results between 2002-2014 from the Harvard Election Data Archive (Ansolabehere et al., 2015, 2018). Due to the notable missingness of necessary data in HEDA, I complement this dataset by further data collection. TABLE III.B.1 indicates the source of each state-year election

results.[15]

Because voting precincts boundaries and names change over time, substantial effort was needed to merge and clean a longitudinal database covering such a long time span. In order to obtain a longitudinal database, I merged all precincts election results across counties, states and years. I proceeded by determining the geocode location of each of the around 15,000 precincts, informed by census and state-level provided geographical shapefiles. To my knowledge, this paper provides the first effort in providing geocode election administrative-based data for over a decade at the most granular administrative level in the United States.

III.3.3 Risk Aversion Data

This paper employs two data sources to measure risk aversion. Cross-sectional individual-level risk aversion and voting preferences data are based on the Cooperative Congressional Election Study (CCES), a national stratified sample survey administered by YouGov. To quantify risk aversion behaviour across time within subject, a second data set is used, the Health and Retirement Study (HRS).

Generally, measures of risk aversion take one of two forms. The first approach is to rely on respondents' self-reported willingness to take risks. Since the accuracy of the respondents' answers may be questionable, I rely on the second approach to measuring risk aversion, that which captures the respondent's attitude to risk taking in a hypothetical lottery. In CCES, individuals are provided with a lottery over a certain, though lower gain and an uncertain, higher gain. Respondents are asked: "Suppose you are the only income earner in the family, and you have a good job guaranteed to give you income every year for life. You are given the opportunity to take a new and

[15]Because availability of precinct level electoral results varies considerably across the US, I relied, where necessary, on direct contact with the states' supervisor of elections or counties' election representatives. Electoral outcomes dating so far back for Florida remained unavailable.

equally good job, with a 50-50 chance it will double your income and a 50-50 chance that it will cut your income by a third. Would you take the new job?" If yes "Suppose the chances were 50-50 that it would double your income, and 50-50 that it would cut it in half. Would you still take the new job?" If no "Suppose the chances were 50-50 that it would double your income and 50-50 that it would cut it by 20 percent. Would you then take the new job?".

Barsky et al. (1997) introduced this type of two-question battery for risk aversion, and a similar question to the one in CCES was asked in the 1996 Panel Study of Income Dynamics. The two question survey instrument generates a four point scale of risk aversion ranging from 0 (risk taking) to 3 (risk averse). In the 2014 CCES module, 54% of respondents are risk averse, 29 % fall in the risk neutral groupings and 18% are risk tolerant as shown in FIGURE III.C.1.

While the question used avoids potential biases associated with self-reported risk taking behaviour, its limitation is that it captures predominantly one's attitudes to financial risks. Although it is unlikely that an alternative, self-reported, measure would encompass all possible dimensions related to risk taking, this concern is nevertheless important to the extent that risk attitudes vary across contexts. To further address this issue, I investigate whether the risk measure employed in this paper has properties generally consistent with broader risk aversion measures, not necessarily including financial risks. I validate this measure using plausibly exogenous factors to risk aversion in SECTION III.C.2.

To quantify risk aversion behaviour across time within subject, I rely on responses to hypothetical gambles from 2002 to 2006 from the Health and Retirement Study (HRS). HRS is a longitudinal panel study that surveys a representative sample of approximatively 20,000 people of the US population. The survey usually presents these gambles to new respondents and a random sub-sample of returning respondents and asks about

their desirability to choose a certain but lower return compared to a more uncertain, but higher gain. Respondents are asked: "Suppose that you are the only income earner in the family. Your doctor recommends that you move because of allergies, and you have to choose between two possible jobs. The first would guarantee your current total family income for life. The second is possibly better paying, but the income is also less certain. There is a 50-50 chance the second job would double your total lifetime income and a 50-50 chance that it would cut it by a third. Which job would you take-the first job or the second job?"

Respondents willing to take the first risky job are then asked about a riskier but better paid job (downside risk of one-half), whereas those who rejected the first job are asked about their willingness to select a job with a downside risk of one-fifth. Those that reject the risk of one fifth are finally asked about a job with a risk of a tenth, whereas those willing to accept the risky jobs are finally asked if they would consider a job with a risk of three-quarters. Based on respondents' answers to these five hypothetical gambles, individuals are ranked into six risk aversion categories, with higher numbers denoting higher risk aversion. Similar to the CCES module, 63% of respondents are falling into the top two risk averse categories, 26% in the middle, risk neutral categories and 11% in the two most risk tolerant groups as shown in FIGURE III.D.2.

The question is comparable to the one used in the CCES as it also focuses on financial risk taking and avoids potential biases associated with self-reported risk taking behaviour. Compared to HRS, the CCES provides additional leverage to study cross-sectionally respondents' vote choice as well as risk taking behaviour. It is limited, however, in making credible claims about over-time changes in risk aversion. Therefore, complementary to the CCES, the HRS is used as it repeatedly presents the same lottery to the same respondents, which allows capturing the possibility of individuals choosing riskier lotteries over time. I validate the measure in a similar way to the CCES one,

and find that, consistent with existing literature, women and older individuals are less willing to take risks, as reported in FIGURE III.D.3 and III.D.4.

III.3.4 Google Data

Google Trends (GT) data has been used for a number of questions, ranging from health (Wilde et al., 2017) to economic indicators (Choi and Varian, 2012). The data is particularly appealing, as it aggregates daily billions of instances in which a particular term is searched on Google. Consequently, these searches can be considered good proxies for the public's interests, concerns and intentions.

To test the effect of exposure to natural disasters on insurance demands, I supplement the analysis with data on Google searches of insurance-themed words. In the United States, GT enables users to download data at the designated market area (DMA) level, which aggregates in fact searches from IP addresses within any given DMA. This allows the researcher to identify the locations in which the searched word or phrase was most popular during the specified time frame. The data returned from GT represents a proportion, not an absolute value – i.e. it provides the proportion of searches made for a particular term out of all searches made in that region for the specified period of time. The results range on a scale between 0 to 100, where 100 is the location with the most popularity as a fraction of total searches in that location. For example, searching the term 'hurricane' across the US week by week for the year 2017, GT assigns the highest value (100) to the data with the highest volume, which is the week 3 to 9 September 2017. Incidentally, this is the period Hurricane Irma approached the US for landfall.

Is it meaningful? Inherently, time-series data may display some noise. In particular, differences from month to month may not necessarily be meaningfully different from levels of activity in the previous months. In order to determine whether changes are meaningful, I normalize each keyword's index to equal 100 at the mean frequency of

searches over the period considered, allowing thus to interpret the coefficients as the percentage change in searches from the mean.[16] In order to insure the validity of the monthly searches, I complement this with weekly searches. GT users are normally able to download weekly data for a period of up to 5 years. Because all but three hurricanes fall between 01/01/2004 (the start of GT data) and 01/01/2009, I restrict the hurricane sample to those in between these dates. Because the index downloaded by GT users represents an average over a sample of IPs within a DMA which varies with the time (day) and IP address of the user that downloads the data, the index used in the analysis represents a simple average of 5 downloads carried over 7 days from two IP addresses.

I select for the analysis 5 insurance related words ("flood insurance", "car insurance", "life insurance", "health insurance", "home insurance") and 3 placebos ("Google", "Yahoo", "Bing") for which I web-scraped data from 1 January 2004 to 1 January 2015. In order to identify each DMA's distance from the sample of hurricanes considered in this paper, I merge the DMA geographical information (Sood, 2018) with the index provided by GT. Finally, repeated queries of a single IP address within a short period of time are discarded. This increases confidence in the validity of the index.

III.3.5 Other Data

Additional data was collected and linked to precincts for the period 2002 to 2014. Incumbency data is derived from electoral returns and using the US Counties Geographical Crosswalk (Pahontu, 2020) is linked to each precinct. Turnout and partisan data is based on Dave Leip's Atlas (Leip, 2017). Data on house value and sales at county level comes from one of the largest online real estate agencies in the US – Zillow. To capture home values across time, I use the Zillow Home Value Index[17] for all home types

[16] For a similar analytical strategy to Google Trends data see Wilde et al. (2017).

[17] This is a smoothed, seasonally adjusted measure of the median estimated home value across a given region and housing type.

from 1996 to 2019 and home sales from 2008 to 2019. In order to explore alternative mechanisms related to authoritarian values, law enforcement and infrastructure spending preferences, I employ the 2016 CCES Module from the University of Mississippi (Dowling, 2019).

III.4 Results

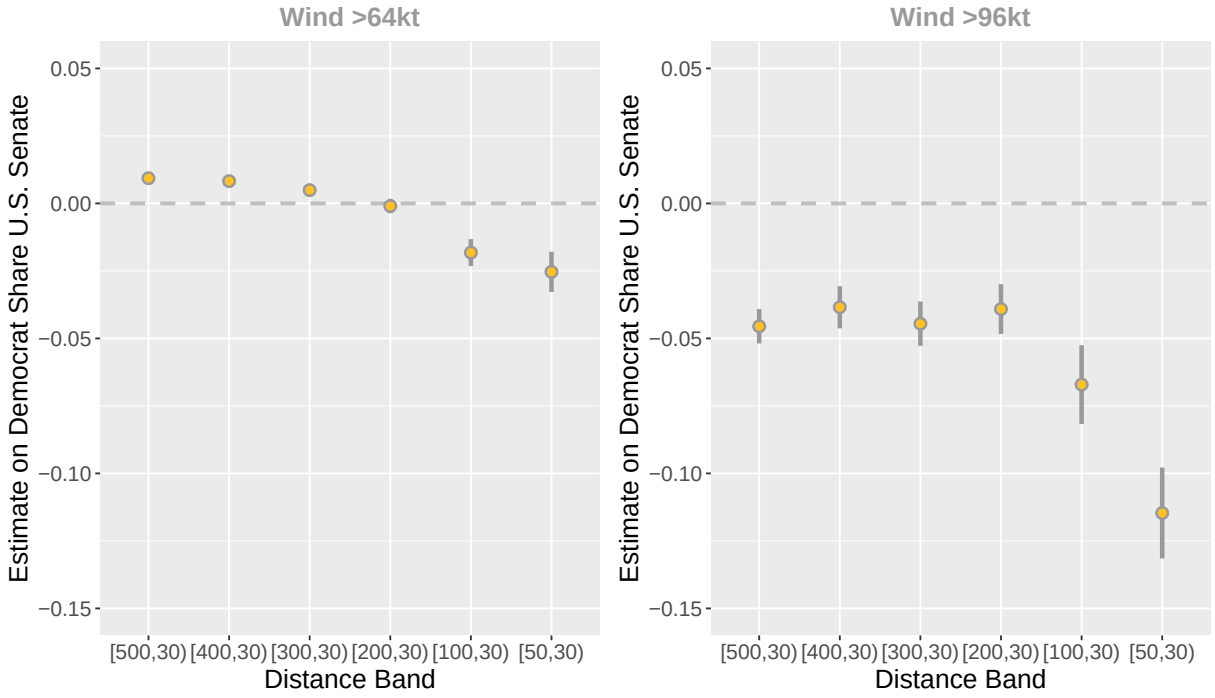
I present in this section the effect of proximity to hurricane paths on the U.S. Senate and House electoral returns. Between 2002-2014 a total of 19 hurricanes have made landfall in the U.S, but many of them overlapped temporally, not all of them were in close proximity to each precinct included in the analysis neither did all hurricanes maintain hurricane-level winds along their entire path. Consequently, I define distance as the minimum (closest) distance to a *hurricane* path, which requires winds of at least 64 knots.[18] This means that a precinct may be part of the treatment group with respect to one hurricane, but part of the control with respect to another one. In order to account for the potential differential effect of exposure to high intensity hurricanes, a second binary treatment specification includes the minimum distance to a *major* hurricane path.[19]

Looking first at the U.S. Senate results, the left panel of FIGURE III.3 shows that proximity to hurricane path of winds of at least 64 knots decreases the Democrat Vote Share. As expected the strongest effect is visible among those closest to the hurricane path, in particular those within 100 km. Within these precincts, the Democrat vote share is reduced by 2.5 percentage points. The magnitude of this effect increases 4

[18] I report alternative distance specification in TABLE III.B.5, III.B.6, III.B.7, III.B.8, III.B.9.

[19] Due to data quality, availability and span, I report in the main specification estimations based on electoral returns from NC, SC, TX, LA, VA. I report the results for NC, SC, TX, LA, VA, AL, MS in FIGURE III.B.7, III.B.8. I explore the robustness of these results to the inclusion of any state by running jacknnife (take one out) estimations which I document in FIGURE III.B.9.

FIGURE III.3: PROXIMITY TO HURRICANES ↓ DEMOCRAT VOTE SHARE IN U.S. SENATE

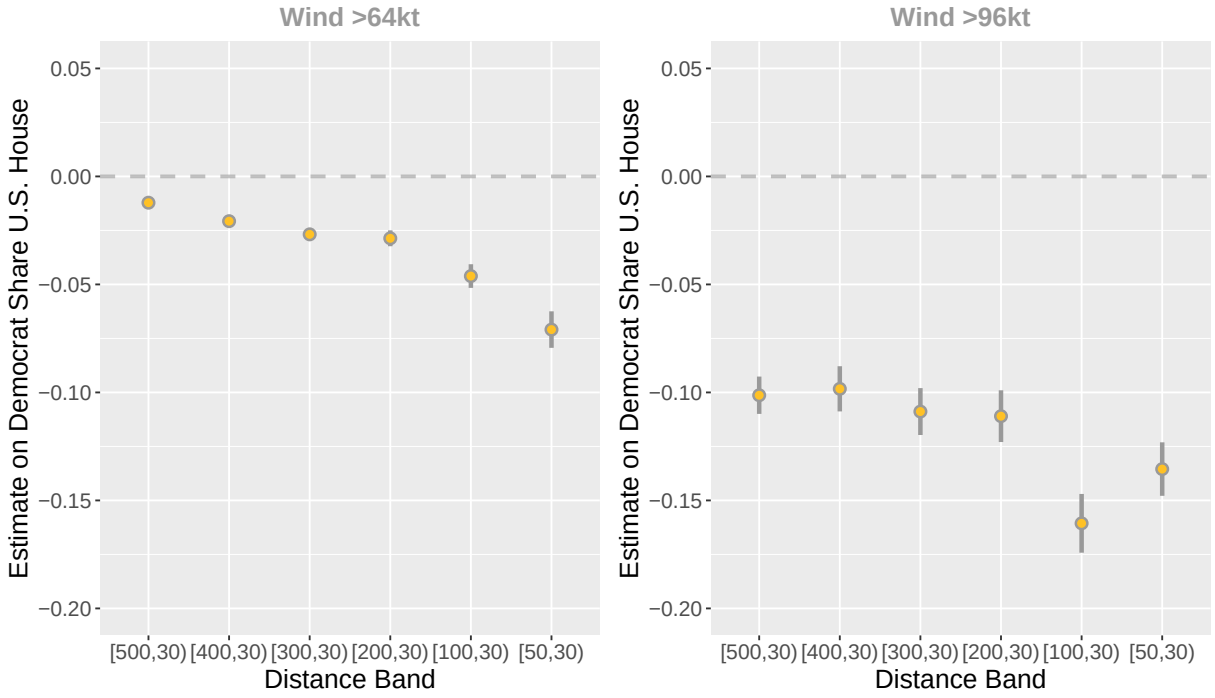


NOTE: The outcome, Democrat vote share, is defined between 0 and 1. Treatment is defined as binary. Distance from hurricane path decreases from left to right. Estimations include precinct, election and state fixed effects. Full results in TABLE III.B.2.

times in size to about 11.5 percentage points when looking only at proximity to major hurricanes, as depicted in the figure's right panel. This represents a very important result given the U.S. Senate's low electoral turnover.

The effect on the U.S. House electoral returns is reported in FIGURE III.4. As before, the left panel includes distances from all five hurricane categories and it predicts an increase in Republican vote share by 7 percentage points for those between 30 and 50 km from the hurricane path. The overall support for Republicans strengthens even further when looking at proximity to major hurricanes, though the variance within precincts 500 km away compared to 50 km away from hurricane path is lower. Proximity to major hurricanes decrease the Democrat Vote Share in the U.S. House by more than 13 percentage points. The magnitude of effect is particularly large given the winning

FIGURE III.4: PROXIMITY TO HURRICANES ↓ DEMOCRAT VOTE SHARE IN U.S. HOUSE



NOTE: The outcome, Democrat vote shares, defined between 0 and 1. Treatment is defined as binary. Distance from hurricane path decreases from left to right. Estimations include precinct, election and state fixed effects. Full results in TABLE III.B.3.

candidates' low margin of victory in states affected by hurricanes such as North Carolina or Virginia.

The results are overall more striking than in the case of the U.S. Senate. While in the Senate it takes at least a category 3 hurricane to make even those within 500 km more likely to support Republicans, in the House this happens from lower-intensity hurricanes. This happens most likely because of the relatively higher electoral turnover in the House, making previously safe precincts more competitive.

TABLE III.B.4 reports estimates from a continuous treatment specification, capturing the treatment's intensity more gradually than the binary specification. Models (1) and (2) report the effects on the Senate elections and (3) and (4) on the House. The models also differentiate between wind intensity exposure.

Similar to the binary case, Republicans benefit from a significant electoral premium in precincts that are closer to hurricane paths. For every 1 unit decrease in the log of distance from major hurricanes, the Democrats vote share decreases by 2 percentage points in the Senate and 5 percentage points in the House. Similar to the binary specification, the effect is strongest for major hurricane exposure in the Senate, whereas decreasing distance from lower intensity hurricanes has a marginally negative effect on Democrats. However, the magnitude of effect is very small, only about a 6th of the size of the coefficient of exposure to major hurricanes.

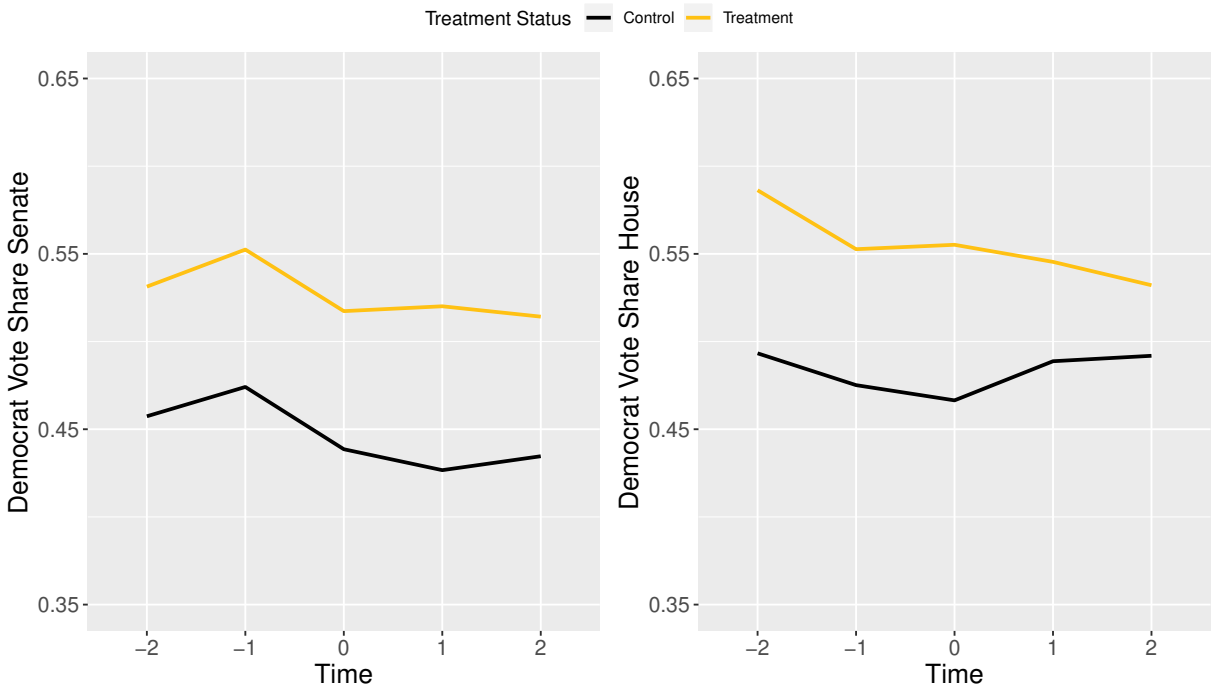
The continuous treatment specification also sheds some light on the hypothesized trade-off between private and public insurance. In particular, Democrats are generally hurt by exposure to natural disasters among those in close proximity to hurricane paths.[20]

In order to give a causal interpretation to the effects discussed, I discuss a key identification assumption on which the estimation is based. That is, in the absence of exposure to hurricanes, the average Democrat vote share in the affected precincts would have followed a similar trend as the average Democrat vote share in the unaffected precincts. Based on this assumption, the point estimate described represents the average treatment effect for treated. To account for potential serial correlation and heteroskedasticity, standard errors are clustered at the unit level.

In testing whether the identification assumption is plausible, I report the average Democrat vote share in pre-treatment elections. In order to do this given the staggered set-up, I standardize the election to equal 0 in the last pre-treatment election. The results depicted in FIGURE III.5 confirm the validity of the causal estimates and increase

[20]I find support for this pattern at the individual level as well. I geocode individuals' location at the zipcode level and using their self-reported vote intention in survey answers to the 2014 module of the CCES, I explore the effect of hurricane proximity on Democrat support. TABLES III.C.5 and III.C.6 confirm in this context too that decreasing distance from hurricane paths decreases individuals' support for the Democrats.

FIGURE III.5: COMMON TRENDS U.S. SENATE AND HOUSE



NOTE: Parallel trends depicted based on model (3) from TABLE III.B.2 and III.B.3, respectively. Time 0 represents last pre-treatment election.

confidence that, in the absence of the treatment, the untreated and treated units would have followed approximatively the same pattern in the post-treatment period. Finally, FIGURE III.B.10 reports placebo tests confirming that future hurricanes do not affect past election results, increasing further the confidence in the causal estimates.

III.5 Spared from Destruction: Unpacking Mechanisms

III.5.1 Risking It

Without doubt, natural disasters are traumatic events, likely to affect individuals' behaviour in the short and, even, the long-run. In fact, recollection of unfortunate experiences associated with hurricanes is thought to last about 7 years (Blake and Gibney, 2011): "I saw an entire town demolished, people fighting over water, breaking

open caskets searching for something that could help them survive" recalled in 2011 a survivor of the 2005 Hurricane Katrina (Ward, 2011, p.266). Experiencing a shock may therefore make individuals *perceive* the world differently, riskier. For example, Malmendier and Nagel (2011) find that changes in risk taking behaviour following a financial shock are owed to changes in beliefs. Similarly, Cameron and Shah (2015) observe that individuals update their perception of risk following exposure to disasters. Exposure to traumatic events may therefore make individuals more likely to take risks (Page et al., 2014; Eckel et al., 2009; Hanaoka et al., 2018).

The increased Republican support in areas *nearly* missed by hurricanes could be driven by a two-step process that links private insurance to risk aversion: (1) exposure to shocks may increase risk aversion by updating one's beliefs about the riskiness of the environment, but (2) subsequent purchase of insurance reduces risk aversion. Emerging empirical work relating the take-up of insurance and the reduction in risk aversion supports, albeit not explicitly, a two-step process (Gallagher, 2014; Cameron and Shah, 2015).

Assets, Risk Aversion and Insurance

When a consumer buys more of a particular good between two time points, the expectation is that her budget constraint changed, rather than her preferences for that good (Andersen et al., 2008). Analogously, most changes in vote choice are attributed to changes in economic circumstances (Margalit, 2013), and never to changes in risk taking.[21] By focusing on situational factors, this literature has largely overlooked a crucial aspect in the decision making process: individuals' tolerance to risk. As not

[21] I introduce the concept of time-varying risk aversion in SECTION III.C.1, discuss the relationship between its time-variant and time invariant components and explain the empirical limitations of existing time-varying accounts. I specify in Section III.C.3 the estimation strategy and suggest that it provides a fair test of time-varying risk aversion as it does not vary individual circumstances as is common in the rest of the literature.

only individuals' future earnings and social status are highly uncertain but also political processes and outcomes, the lack of accounting for risk tolerance represents a huge omission. For example, recognizing that more risk averse individuals prefer certainty and security, risk aversion is found to promote support for the welfare state (Duch and Rueda, 2015; Gärtner et al., 2017; Assandri et al., 2017; Durante et al., 2014). Incorporating risk aversion into vote choice calculations therefore complicates and enhances the way scholars of American politics and political economy alike conceive of the state-market nexus and interpret elections outcomes in the United States.

As prior work has shown, although vote choice is largely driven by changes in economic circumstances and concerns over taxation (Margalit, 2013; Jerzak and Libgober, 2020), citizens derive utility and taxation preferences from their wealth, in addition to income, having therefore the option to privately insure themselves (Ansell, 2014; Busemeyer and Iversen, 2020; Cheng and Vahid, 2011; Hilt and Rahn, 2018; Hall and Yoder, 2019). This significantly alters the conclusions of accounts looking only at government-provided insurance. Following work relating consumption including assets, risk aversion, optimal insurance purchasing and wealth (Zanetti, 2014; Cook and Graham, 1977; Mossin, 1968; Swanson, 2012), I am able to relate theoretically the states of nature associated with hurricane exposure with insurance choices in the private market (e.g. home, car) and public goods (e.g. spending on police, street lighting) aimed at recovering the asset's value. If individuals value their assets more than their consumption (Cook and Graham, 1977), then their optimal choice is to purchase insurance at the expense of publicly provided one. Specifically, asset damage would impose substantial financial costs if hit, which is why insurance becomes relatively more expensive. If purchased, this reduces the affordability of the existing income tax, given a budget constraint. Relying instead on federally provided assistance such as FEMA becomes less appealing not only because this would not provide the desired type of insurance

(e.g. car insurance) but also because this involves a more uncertain process including but not limited to applicant eligibility. Therefore, consistent with optimal insurance purchasing, individuals should intensify their inquiries for private insurance, especially asset insurance, but not for federal assistance programs.

Additionally, it can be shown that the household's insurance margin has substantial effects not only on the assets' value but also on the individual's risk aversion: as households increasingly offset potential shocks to asset values by varying their insurance level, their relative risk aversion decreases. This happens if (i) the concavity of the relative risk aversion parameter depends on assets, unlike the traditional Arrow-Pratt model (Zanetti, 2014) and (ii) if individuals care more about their assets than their consumption. Effectively, assets act as a cushion against economic loss, and, once insured, this creates an as-if wealth effect, which as in the traditional Arrow case, triggers an increase in individuals' willingness to take risks.

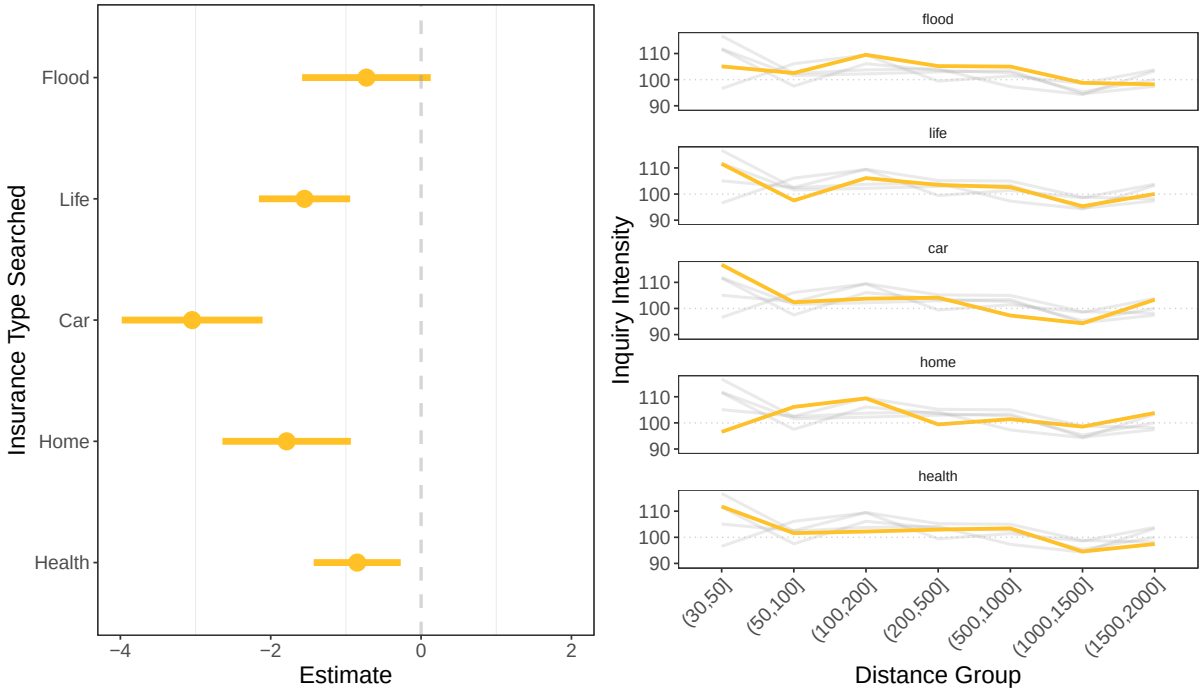
Results and Discussion

I explore the relationship between intensity of insurance inquiries and hurricane proximity based on monthly Google searches within high-risk areas. Out of all month-hurricane observations, I restrict the estimation only to those months for which Google searches are available that coincide with months in which hurricanes occurred. The remaining sample includes around 700 DMA-month observations. The coefficients thus can be interpretable as the average treatment effect of the treated, more specifically, the effect of proximity to hurricane on Google searches among the DMAs exposed to hurricanes (IP addresses are geocoded at DMA level).

As the left panel of FIGURE III.6 reports, there is a positive relationship between hurricane proximity and insurance-related searches. Specifically, for every 100 km further away from the hurricane path, insurance-related Google searches decrease. The

magnitude of effects varies across the five insurance terms considered, with the largest magnitudes corresponding to asset insurance, such as car insurance (3%) and home insurance (1.5%) and the lowest for flood insurance (1%). The right panel of this figure shows the distribution of searches based on distance from the hurricane path reported to the mean searches for each term, normalized at 100. Those within 500 km from the hurricane path have notably higher private insurance inquiries than the average searches. As expected, hurricane proximity does not increase searches for public provided insurance captured by FEMA searches (FIGURE III.E.1).

FIGURE III.6: HURRICANE PROXIMITY ↑ PRIVATE INSURANCE INQUIRIES



NOTE: The left panel reports linear estimates based on monthly Google searches on various private insurance keywords. The dependent variables are indexes of search frequency normalized to the mean level of searches during the sample period (2004-2015). All regressions include state, month and year fixed effects and state-month trends. Full estimates are reported in TABLE III.E.1. The same analysis is repeated based on weekly searches and reported in TABLE III.E.2. The right panel plots average monthly inquiries based on individuals' location relative to the hurricane path. The inquiry intensity is normalized at 100, such that values above this threshold represent a higher search intensity.

TABLE III.E.2 reports results based on weekly Google Trends data. These results are consistent with those based on the monthly data, though with the magnitude of effects

is, as expected, smaller than in the monthly estimation. Out of all week-hurricane observations, the estimation includes about 700 observations and estimates that for every 100 km away from the hurricane path, weekly insurance-related searches decreased by as little as 0.6% and as much as 1%. As before in the monthly data, the largest magnitudes are associated with asset insurance searches.

These results provide empirical traction on the likelihood of the relative risk aversion parameter to depend on assets. As theorized, the expectation would therefore be that individuals' willingness to take risks also increases with the insurance uptake.

I quantify risk aversion changes across time with staggered difference-in-difference estimates from the HRS. I also report cross-sectional averages of proximity to hurricanes on risk aversion based on CCES estimates in Section III.C.4. I calculate each respondent's distance from hurricane paths by geocoding her location, provided at zipcode level.

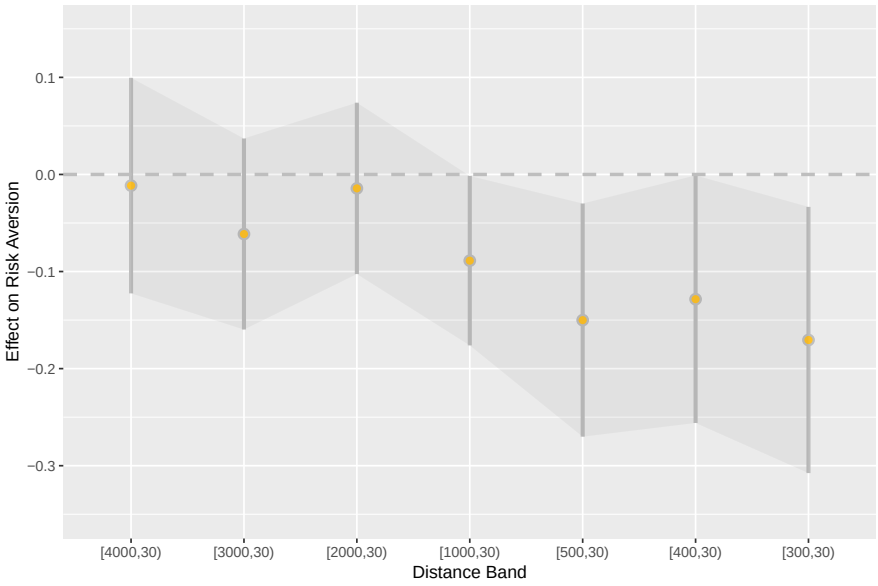
Figure III.7 plots within individual changes in risk aversion as one's proximity to hurricane paths changes over time. Consistent with expectations, individuals choose riskier gambles as their proximity to hurricane paths increases. Using a continuous rather than binary specification, a similar result can be shown for those in close proximity to hurricane paths in the HRS (Figure III.D.5) and CCES (Figure III.C.11).

In sum, I find empirical support for the two-step argument in which exposure to risk increases the likelihood of insurance uptake, especially that of asset insurance, and that, consequently, those more closely exposed to hazard become more risk tolerant.

III.5.2 Alternative Mechanisms

There may be a number of alternative mechanisms through which proximity to hurricanes increases Republican support other than through its effect on risk aversion. Although the research design does not rely on instrumental variable estimation, it

FIGURE III.7: HURRICANE PROXIMITY MAKES INDIVIDUALS CHOOSE RISKIER GAMBLES



NOTE: The outcome, risk aversion, defined between 1 and 6, with higher values denoting higher risk aversion. Treatment bands defined as binary. Distance from hurricane path decreases from left to right. Estimations include individual and time fixed effects. Full results are reported in TABLE III.D.3.

may still be valuable to test potential violations of the as-it-were exclusion restriction. Where possible, I estimate difference-in-difference models, but in most situations I rely on the post-exposure 2014 and 2016 CCES surveys. As exposure to hurricanes already occurred by the time individuals respond to these surveys, any differences in behaviour, attitudes and preferences of individuals near missed compared to more far away misses should already be visible and even cross-sectional estimation would pick up such effects.

Praying

Are individuals more religious if they are spared from destruction? If individuals believe they are lucky they have been nearly missed, they may turn to God in gratitude for having been spared. Such behaviour would be consistent with the empirical patterns found in this paper: religious people are more likely to be Republican and less likely

to support taxation and public insurance (Scheve et al., 2006). Similarly, the need to cope with shocks such as natural disasters may account for an individual's higher religiosity (Sinding Bentzen, 2019). In order to explore this mechanism, I rely on church attendance data from the 2014 CCES survey, a common measure of an individual's religiosity. FIGURE III.F.1 reports by distance bands the effect of being nearly missed versus being more far away and shows that close proximity to hurricanes has no effect on individual's church attendance frequency.

Authoritarian Values, Law and Order

"There was an atmosphere of lawlessness, the place was out of control. I was frightened, to be honest", New Orleans resident Jonathan Hare recalls.[22]

As natural disasters create disruption, chaos and panic, even individuals nearly missed may observe such effects. First, this observation or simply the threat of disruption and income loss may induce more authoritarian values in people. If so, this would be consistent with the reduced form results in that people with authoritarian values are more likely to support the Republican party and people are more likely to be authoritarian when facing threats (e.g. terrorism) (Hetherington and Suhay, 2011). To measure authoritarian values, I use the child-rearing measure of authoritarianism, a standard measure in American politics research (Hetherington and Weiler, 2009; Wronski et al., 2018). As FIGURE III.F.2 reports, there is no effect of proximity to hurricane on authoritarianism values, regardless if it is measured with respect to independence, curiosity, obedience, or being considerate.

Second, observing disruption induced by natural disasters, especially to the transportation and infrastructure system, may induce individuals to be less supportive of public government spending as it may be viewed inefficient in face of such disasters.

[22] "Hurricane Katrina: Readers' Experiences", *BBC*, 1 September 2005

Therefore, individuals may become more supportive of the Republican party which proposes to cut taxes. To address this concern, I rely on respondents' support of Congress passing the Highway and Transportation Funding Act and show in FIGURE III.F.3 that proximity to hurricanes has no effect on whether individuals support this initiative or not. As individuals may attribute blame incorrectly to different government levels, such as state or local authorities, I check whether individuals wish the state to increase spending on infrastructure or whether they grade poorly the state of roads in their local community. Similar to the results for the federal government, FIGURE III.F.3 shows no association between different levels of government spending on infrastructure or road quality and proximity to hurricanes.

Learning

Natural disasters and other shocks may represent opportunities for individuals to learn new information about incumbents, governments, the economy or possible future shocks (Ashworth et al., 2018; Eggers, 2014; Malmendier and Nagel, 2011; Eggers and Fouirnaies, 2014; Cameron and Shah, 2015). I discuss the role of information and dissonance in APPENDIX III.G by making use of longitudinal precinct electoral returns from New Jersey for the period 2002-2012. Hurricane Irene (2011) made landfall in New Jersey as a category 1 hurricane and was the first hurricane to make landfall since 1903 in New Jersey.[23] Therefore, New Jersey is an atypical state for hurricane exposure and in this respect could be different from states facing repetitive exposures such as Texas. Although milder, I find support in New Jersey for a similar electoral pattern as in the high-risk states following a near miss. I also discuss in APPENDIX III.G implications for incumbent support.

[23]"Hurricane Irene", *NOAA*, 28 August 2011 and "Hurricane Irene Electric Response Report", *NJ Authorities*, 14 December 2011

III.5.3 Threats to Identification

Identification in this paper relies on the conjecture that natural disasters are as good as randomly assigned *within* high-risk areas. This was shown to be true even in settings with advanced warning and forecasting systems (Currie and Rossin-Slater, 2013). Given the randomness of the hurricane paths, the identification assumption underlying the interpretation of the distance from hurricane coefficients in these equations is that risk-seeking individuals do not differentially relocate to or away from areas struck by hurricanes. In supporting the proposed identification strategy, I investigate whether risk-averse individuals tend to cluster more in certain areas or whether their potential relocation is related to either proximity to the hurricanes studied or their risk aversion level.

First, I observe the place of residence and risk aversion level of CCES respondents and I am therefore able to correlate detailed information about individuals' location with their risk preferences. As evident from FIGURE III.C.9, the distribution of risk aversion is similar in high- and low- hurricane risk areas. In fact, the correlation between high risk areas and risk aversion is of 0.1.

Second, HRS respondents are tracked across time, including when they move residence. In TABLE III.D.2 I investigate whether an individual's decision to move correlates with her risk aversion. I observe when individuals from high-risk states move zipcodes – either within high-risk states or outside these areas – and correlate decisions to move between 2002 and 2004, between 2002 and 2006 and between 2004 and 2006 with risk aversion at each interview-year. As risk aversion differences between movers and non-movers are not statistically significant, I conclude that it is unlikely HRS respondents move within or away from high-risk areas because of reasons related to (changes in) risk aversion. What is more, HRS actually asks respondents the reason

for their relocation and it is almost always the case that they move for personal reasons (e.g. being closer to their children, job opportunities) rather than because of the weather.

Third, I use Google Trends monthly data from 2004 to 2015 to investigate whether proximity to hurricanes for individuals from high-risk areas has any effect on their searches for real estate agencies in the month when hurricanes make landfall. I use four keywords capturing major real estate agencies "Zillow", "Remax", "Redfin" and the keyword "Real Estate Agent". As depicted in FIGURE III.E.2, individuals' search pattern for real estate agents is not statistically different if they are closer to hurricane paths in months when hurricanes make landfall.

Fourth, I rely on data from Zillow, one of the biggest US online real estate agencies, to investigate whether proximity to hurricanes has an effect on either home sales or home values. I use county level data from 1996 to 2019 for home values and from 2008 to 2019 for home sales, including state, time fixed effects and state-time trends and conclude in FIGURE III.E.3 that proximity to hurricanes has no effect on either home sales or values, compared to times when the same county was further away from the path.

III.6 Discussion

Risk puts at jeopardy the very idea of the American dream – the belief that working hard is key to succeeding and securing comfort financially. Even in a system in which the language of personal responsibility is flourishing and unfortunate events are blamed on the victims (Hacker, 2019; Alesina et al., 2001), leading theories of accountability and distributional conflict would expect exposure to risk to foster Democrat support or to penalize incumbents (Margalit, 2013; Hilt and Rahn, 2018).

Relying on exogenous variation in risk exposure within *nearly*-hit high risk areas prompted by the randomness of hurricane paths, I find instead that risk exposure fosters Republican, not Democrat, support. Using a difference-in-differences framework, I document an electoral penalty of 5 to 15 percentage points against Democrats in US House and Senate races between 2002 and 2014 in areas nearly missed by hurricanes.[24]

I explore several drivers likely to account for an increase in Republican vote share in areas spared from destruction: religiosity, authoritarian values, law and order, learning, cognitive dissonance and incumbency. Empirical evidence fails to support any of these possible accounts of changing vote choice. Instead, I advance an alternate theory in which changing Democrat support is driven by changes in a time-variant component of risk aversion. To be sure, I find support for a two-step process linking hurricane proximity and risk aversion: (1) being a near-miss increases risk aversion behaviour by updating beliefs about the riskiness of the environment prompting insurance uptake, (2) subsequent purchase of insurance reduces risk aversion. I rely on individuals' intensity of insurance inquiries to confirm that insurance, in particular asset insurance, peaks in months when hurricanes nearly hit them and on panel data on risk aversion to substantiate the claim that individuals choose a riskier gamble following a near miss. Together, these results provide convincing evidence of the likelihood of the proposed mechanism.

Is the observed patterns generalizable? Availability of private insurance appears theoretically and empirically crucial. This may vary with a country's level of development or even with national economic and political institutions. For example, in a liberal market economy like the US where generally public insurance is lower compared to coordinated market economies, it could be that private insurance markets are more developed. Consequently, the results could be replicable in countries with developed

[24]These results are striking given that general elections occur right after the hurricane season. One policy implication therefore concerns a potential revision of the timing of elections in the United States.

private insurance markets. Whether one should expect this where public insurance is low or not may be an interesting avenue for future research.

Finally, this paper's theoretical and empirical contribution may provide traction on heated on-going debates about voters' myopia and rationality. It is rather consistent with this papers' findings that voters are not spatially myopic as they do not punish US House incumbents, but only Democrat incumbents. However, this remains largely beyond the scope of this paper, so further research could rely on similar research designs to shed light on this issue. Among other contributions, this paper provides a novel longitudinal precinct level election returns data that could be used in future research.

Appendix

III.A Appendix A – Hurricanes

Hurricanes making landfall in continental US form in the Atlantic Ocean Basin. A cyclone is steered across the ocean by winds. The eye of the storm is a circular area with light winds that develops in the centre of a severe cyclone. The eyewall is the band of clouds surrounding the eye where the strongest winds occur. The radius of maximum winds is given by the distance between the centre of the storm and the location of its maximum winds. In the case of hurricanes, the radius is generally found at the inner edge of the eyewall. Cyclones in the North Atlantic basic are classified by their sustained wind speeds using the Saffir-Simpson Scale as documented in TABLE III.A.1. A hurricane is defined as a cyclone with sustained winds of at least 64 knots, cut-off that is used to calculate proximity to a *hurricane*. A major hurricane is characterized by sustained winds of at least 96 knots, cut-off used in calculating distance to *major hurricanes*.

TABLE III.A.1: TYPES OF HURRICANES: SAFFIR-SIMPSON

Hurricane Category	Winds (kt)	Description
1	64-82	Very dangerous winds will produce some damage
2	83-95	Extremely dangerous winds will cause extensive damage
3	96-112	Devastating damage will occur
4	113-136	Catastrophic damage will occur
5	$\geq$ 137	Catastrophic damage will occur

SOURCE: NOAA. Major Hurricanes are those with at least 96kt winds.

FIGURE III.A.1: HURRICANE COUNT IN HIGH-RISK AREAS 2003-2014

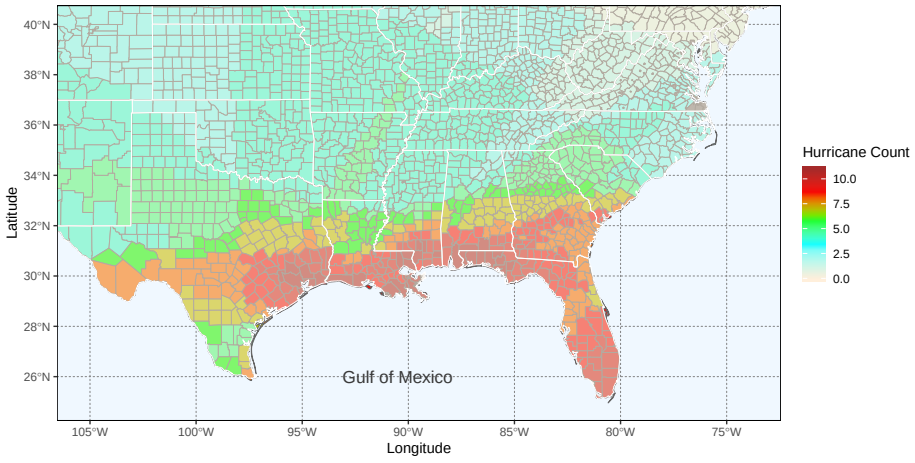


Table III.A.2: Hurricanes Considered

State	Year	Hurricane Name	Hurricane Category in State (max)
AL	2004	Ivan	3
AL	2005	Dennis	3
FL	2004	Charley	4
FL	2004	Frances	2
FL	2004	Jeanne	3
FL	2005	Dennis	3
FL	2005	Katrina	1
FL	2005	Wilma	3
LA	2005	Cindy	1
LA	2005	Katrina	3
LA	2007	Humberto	1
LA	2008	Gustav	2
LA	2012	Isaac	1
MS	2005	Katrina	3
SC	2004	Gaston	1
SC	2004	Charley	1
NC	2003	Isabel	2
NC	2004	Charley	1
NC	2011	Irene	1
NC	2014	Arthur	2
NJ	2011	Irene	1
TX	2003	Claudette	1
TX	2005	Rita	3
TX	2007	Humberto	1
TX	2008	Dolly	1
TX	2008	Ike	2
VA	2003	Isabel	2

Source: National Hurricane Centre NOAA

Table III.A.3: Placebo Hurricanes Considered

Year	Hurricane Name	Hurricane Category At Landfall (max)
2016	Hermine	1
2016	Matthew	1

Source: National Hurricane Centre NOAA

TABLE III.A.4: SEQUENCE OF HURRICANES AND PLACEBO HURRICANES

Year	Hurricane	Date Hit US	k
Main Hurricanes			
2003	Claudette	July 2003	19
2003	Isabel	September 2003	18
2004	Charley	13 August 2004	17
2004	Gaston	29 August 2004	16
2004	Frances	6 September 2004	15
2004	Ivan	16 September 2004	14
2004	Jeanne	18 September 2004	13
2005	Cindy	6 July 2005	12
2005	Dennis	10 July 2005	11
2005	Katrina	25 August 2005	10
2005	Rita	24 September 2005	9
2005	Wilma	24 October 2005	8
2007	Humberto	13 September 2007	7
2008	Dolly	26 July 2008	6
2008	Gustav	1 September 2008	5
2008	Ike	12 September 2008	4
2011	Irene	27 August 2011	3
2012	Isaac	29 August 2012	2
2014	Arthur	4 July 2014	1
Placebo Hurricanes			
2016	Hermine	28 August 2016	99
2016	Matthew	October 2016	98

SOURCE: NOAA INDIVIDUAL HURRICANE REPORTS

III.B Appendix B – Precinct Level Data

TABLE III.B.1: DATA SOURCES FOR PRECINCT-LEVEL ESTIMATION

Data Source	State	Year	Data Type	Geographical Level
Author Collection	AL	2002	Election Return	Precinct
HEDA	AL	2004-2014	Election Return	Precinct
HEDA	LA	2002-2014	Election Return	Precinct
HEDA	MS	2006-2012	Election Return	Precinct
Author Collection	MS	2004	Election Return	Precinct
Author Collection	SC	2002-2006	Election Return	Precinct
HEDA	SC	2008-2014	Election Return	Precinct
HEDA	NC	2002-2014	Election Return	Precinct
HEDA	TX	2002-2014	Election Return	Precinct
Author Collection	VA	2002, 2004, 2014	Election Return	Precinct
HEDA	VA	2006-2012	Election Return	Precinct
HEDA	NJ	2002-2008	Election Return	Precinct
Author Collection	NJ	2010, 2012	Election Return	Precinct

NOTE: Election Returns refer to U.S. House and Senate Votes and are collected only for general elections. Only votes cast on election day are considered and early voting, provisional, absentee votes are discarded, where available. For states that do no hold primaries, such as Louisiana, vote shares are constructed by summing the votes received by all candidates belonging to the same party.

Table III.B.2: Democrat Vote Share U.S. Senate: Main Specification

	Distance Bandwidths from All Hurricanes					
	<50km	<100km	<200km	<300km	<400km	<500km
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-0.025***	-0.018***	-0.001	0.005***	0.008***	0.009***
	(0.004)	(0.003)	(0.001)	(0.001)	(0.001)	(0.001)
Observations	274,841	274,841	274,841	274,841	274,841	274,841
R-squared	0.103	0.103	0.102	0.103	0.103	0.103
Number of Clusters	56,667	56,667	56,667	56,667	56,667	56,667
Control Mean	.454	.453	.448	.448	.448	.450
	Distance Bandwidths from Major Hurricanes					
	(7)	(8)	(9)	(10)	(11)	(12)
Treatment	-0.115***	-0.067***	-0.039***	-0.045***	-0.038***	-0.046***
	(0.009)	(0.007)	(0.005)	(0.004)	(0.004)	(0.003)
Observations	61,816	61,816	61,816	61,816	61,816	61,816
R-squared	0.120	0.118	0.117	0.118	0.117	0.120
Number of Clusters	12,832	12,832	12,832	12,832	12,832	12,832
Control Mean	.489	.489	.489	.488	.488	.490
State FE	✓	✓	✓	✓	✓	✓
Election FE	✓	✓	✓	✓	✓	✓
Precinct FE	✓	✓	✓	✓	✓	✓

Note: Dependent variable, vote share, between 0 and 1. Treatment is defined as binary. Estimations based on electoral returns from NC, SC, LA, VA, TX. Standard errors are clustered by precinct-hurricane. *** p<0.01, ** p<0.05, * p<0.1

Table III.B.3: Democrat Vote Share U.S. House: Main Specification

	Distance Bandwidths from All Hurricanes					
	<50km	<100km	<200km	<300km	<400km	<500km
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-0.071***	-0.046***	-0.029***	-0.027***	-0.021***	-0.012***
	(0.004)	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)
Observations	317,803	317,803	317,803	317,803	317,803	317,803
R-squared	0.055	0.055	0.055	0.055	0.055	0.054
Number of Clusters	56,677	56,677	56,677	56,677	56,677	56,677
Control Mean	.494	.493	.488	.489	.489	.49
	Distance Bandwidths from Major Hurricanes					
	(7)	(8)	(9)	(10)	(11)	(12)
Treatment	-0.135***	-0.161***	-0.111***	-0.109***	-0.098***	-0.101***
	(0.006)	(0.007)	(0.006)	(0.006)	(0.005)	(0.004)
Observations	72,577	72,577	72,577	72,577	72,577	72,577
R-squared	0.071	0.077	0.076	0.076	0.075	0.079
Number of Clusters	12,833	12,833	12,833	12,833	12,833	12,833
Control Mean	.532	.532	.532	.53	.531	.533
State FE	✓	✓	✓	✓	✓	✓
Election FE	✓	✓	✓	✓	✓	✓
Precinct FE	✓	✓	✓	✓	✓	✓

Note: Dependent variable, vote share, between 0 and 1. Treatment is defined as binary. Estimations based on electoral returns from NC, SC, LA, VA, TX. Standard errors are clustered by precinct-hurricane. *** p<0.01, ** p<0.05, * p<0.1

Table III.B.4: Democrat Vote Share: Main Specification (Continuous Treatment)

	U.S. Senate		U.S. House	
	(1)	(2)	(3)	(4)
Log Distance	-0.003***	0.020***	0.012***	0.053***
	(0.001)	(0.002)	(0.001)	(0.002)
Observations	274,841	61,816	317,803	72,577
R-squared	0.103	0.119	0.055	0.080
Number of Clusters	56,667	12,832	56,677	12,833
Wind	≥64kt	≥ 96kt	≥64kt	≥ 96kt
State FE	✓	✓	✓	✓
Election FE	✓	✓	✓	✓
Precinct FE	✓	✓	✓	✓

Note: Dependent variable, vote share, between 0 and 1. Treatment is continuous. Due to skewness, log of distance is used and reported. Estimations based on electoral returns from NC, SC, LA, VA, TX. Standard errors are clustered by precinct-hurricane. *** p<0.01, ** p<0.05, * p<0.1

Table III.B.5: Democrat Vote Share U.S. Senate: Closest Distance

	Distance Bandwidths from All Hurricanes					
	<50km	<100km	<200km	<300km	<400km	<500km
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-0.026***	0.004*	-0.000	0.006***	0.008***	0.013***
	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
Observations	60,856	60,856	60,856	60,856	60,856	60,856
R-squared	0.113	0.111	0.111	0.112	0.112	0.112
Number of Clusters	12,623	12,623	12,623	12,623	12,623	12,623
Control Mean	.455	.448	.442	.44	.443	.447
	Distance Bandwidths from Major Hurricanes					
	(7)	(8)	(9)	(10)	(11)	(12)
Treatment	-0.114***	-0.067***	-0.034***	-0.034***	-0.033***	-0.042***
	(0.009)	(0.007)	(0.005)	(0.005)	(0.004)	(0.004)
Observations	45,278	45,278	45,278	45,278	45,278	45,278
R-squared	0.140	0.136	0.134	0.134	0.134	0.137
Number of Clusters	9,473	9,473	9,473	9,473	9,473	9,473
Control Mean	.487	.487	.488	.488	.489	.491
State FE	✓	✓	✓	✓	✓	✓
Election FE	✓	✓	✓	✓	✓	✓
Precinct FE	✓	✓	✓	✓	✓	✓

Note: Dependent variable, vote share, between 0 and 1. Treatment is defined as binary. Estimations based on electoral returns from NC, SC, LA, VA, TX. Standard errors are clustered by precinct. *** p<0.01, ** p<0.05, * p<0.1

Table III.B.6: Democrat Vote Share U.S. House: Closest Distance

	Distance Bandwidths from All Hurricanes					
	<50km	<100km	<200km	<300km	<400km	<500km
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-0.070***	-0.037***	-0.046***	-0.027***	-0.013***	0.001
	(0.004)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)
Observations	70,988	70,988	70,988	70,988	70,988	70,988
R-squared	0.059	0.058	0.061	0.057	0.055	0.055
Number of Clusters	12,625	12,625	12,625	12,625	12,625	12,625
Control Mean	.492	.486	.48	.482	.481	.486
	Distance Bandwidths from Major Hurricanes					
	(7)	(8)	(9)	(10)	(11)	(12)
Treatment	-0.132***	-0.158***	-0.108***	-0.104***	-0.097***	-0.101***
	(0.006)	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)
Observations	54,001	54,001	54,001	54,001	54,001	54,001
R-squared	0.069	0.076	0.073	0.073	0.072	0.078
Number of Clusters	9,474	9,474	9,474	9,474	9,474	9,474
Control Mean	.523	.523	.524	.525	.526	.528
State FE	✓	✓	✓	✓	✓	✓
Election FE	✓	✓	✓	✓	✓	✓
Precinct FE	✓	✓	✓	✓	✓	✓

Note: Dependent variable, vote share, between 0 and 1. Treatment is defined as binary. Estimations based on electoral returns from NC, SC, LA, VA, TX. Standard errors are clustered by precinct. *** p<0.01, ** p<0.05, * p<0.1

TABLE III.B.7: DEMOCRAT VOTE SHARE: CLOSEST DISTANCE SPECIFICATION (CONTINUOUS TREATMENT)

	U.S. SENATE		U.S. HOUSE	
	(1)	(2)	(3)	(4)
Log Distance	-0.013***	0.014***	0.013***	0.051***
	(0.001)	(0.002)	(0.002)	(0.002)
Observations	60,856	45,278	70,988	54,001
R-squared	0.117	0.135	0.058	0.077
Number of Clusters	12,623	9,473	12,625	9,474
Wind	≥64kt	≥ 96kt	≥64kt	≥ 96kt
State FE	✓	✓	✓	✓
Election FE	✓	✓	✓	✓
Precinct FE	✓	✓	✓	✓

NOTE: Dependent variable, vote share, between 0 and 1. Treatment is continuous. Due to skewness, log of distance is used and reported. Estimations based on electoral returns from NC, SC, LA, VA, TX. Standard errors are clustered by precinct. *** p<0.01, ** p<0.05, * p<0.1

Table III.B.8: Democrat Vote Share: Strongest Hurricane Specification

	U.S. Senate					
	<50km	<100km	<200km	<300km	<400km	<500km
	(1)	(2)	(3)	(4)	(5)	(6)
Treatment	-0.063***	-0.054***	-0.050***	-0.045***	-0.077***	-0.063***
	(0.005)	(0.005)	(0.005)	(0.004)	(0.007)	(0.006)
Observations	63,509	63,509	63,509	63,509	63,509	63,509
R-squared	0.116	0.116	0.116	0.116	0.120	0.119
Number of Clusters	12,623	12,623	12,623	12,623	12,623	12,623
Control Mean	.512	.512	.51	.508	.506	.507
	U.S. House					
	(7)	(8)	(9)	(10)	(11)	(12)
Treatment	-0.033***	-0.029***	-0.017***	-0.039***	-0.079***	-0.061***
	(0.002)	(0.002)	(0.003)	(0.004)	(0.006)	(0.005)
Observations	74,394	74,394	74,394	74,394	74,394	74,394
R-squared	0.052	0.052	0.051	0.053	0.055	0.054
Number of Cluster	12,625	12,625	12,625	12,625	12,625	12,625
Control Mean	.502	.502	.500	.497	.494	.494
State FE	✓	✓	✓	✓	✓	✓
Election FE	✓	✓	✓	✓	✓	✓
Precinct FE	✓	✓	✓	✓	✓	✓

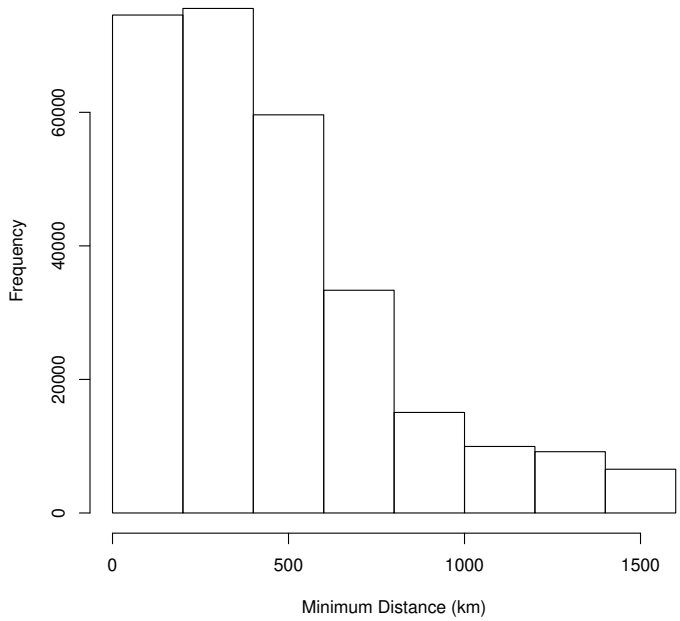
Note: Dependent variable, vote share, between 0 and 1. Treatment is continuous. Due to skewness, log of distance is used and reported. Estimations based on electoral returns from NC, SC, LA, VA, TX. Standard errors are clustered by precinct. *** p<0.01, ** p<0.05, * p<0.1

Table III.B.9: Democrat Vote Share: Strongest Hurricane Specification (Continuous Treatment)

	Senate	House
Log Distance	0.028***	0.017***
	(0.003)	(0.002)
Observations	63,509	74,394
R-squared	0.119	0.054
Number of Clusters	12,623	12,625
State FE	✓	✓
Election FE	✓	✓
Precinct FE	✓	✓

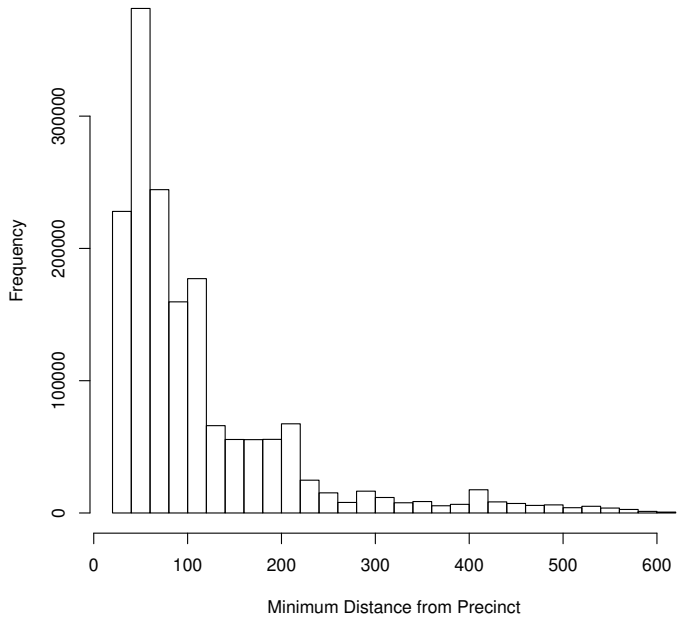
Note: Dependent variable, vote share, between 0 and 1. Treatment is continuous. Due to skewness, log of distance is used and reported. Estimations based on electoral returns from NC, SC, LA, VA, TX. Standard errors are clustered by precinct. *** p<0.01, ** p<0.05, * p<0.1

FIGURE III.B.1: DISTRIBUTION OF DISTANCE FROM ALL HURRICANES OF PRECINCTS IN TREATED STATES



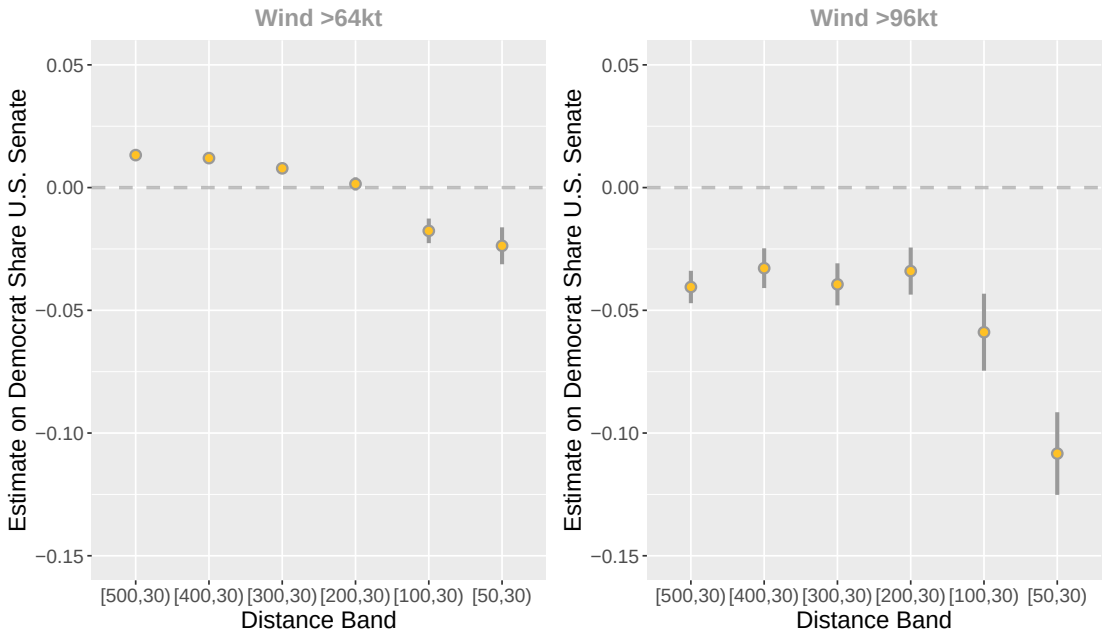
NOTE: Distance from hurricanes calculated as in FIGURE III.2.

FIGURE III.B.2: DISTRIBUTION OF DISTANCE FROM CLOSEST HURRICANES EXPERIENCED OF PRECINCTS IN TREATED STATES



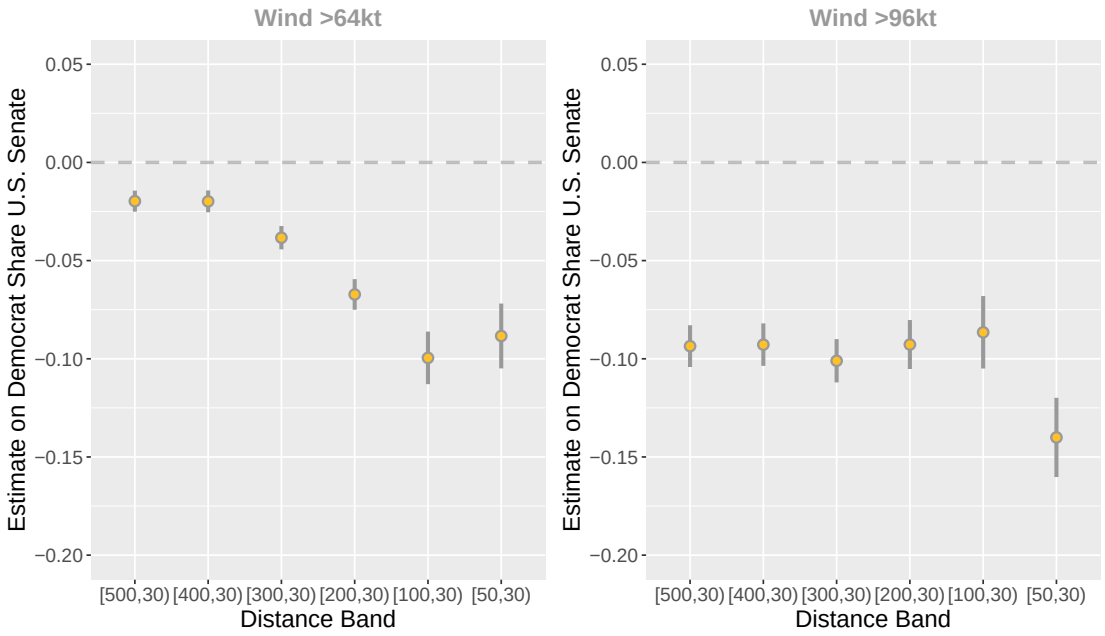
NOTE: Distance from hurricanes calculated as in FIGURE III.2.

FIGURE III.B.3: ESTIMATED DEMOCRAT SENATE SHARE AND TURNOUT



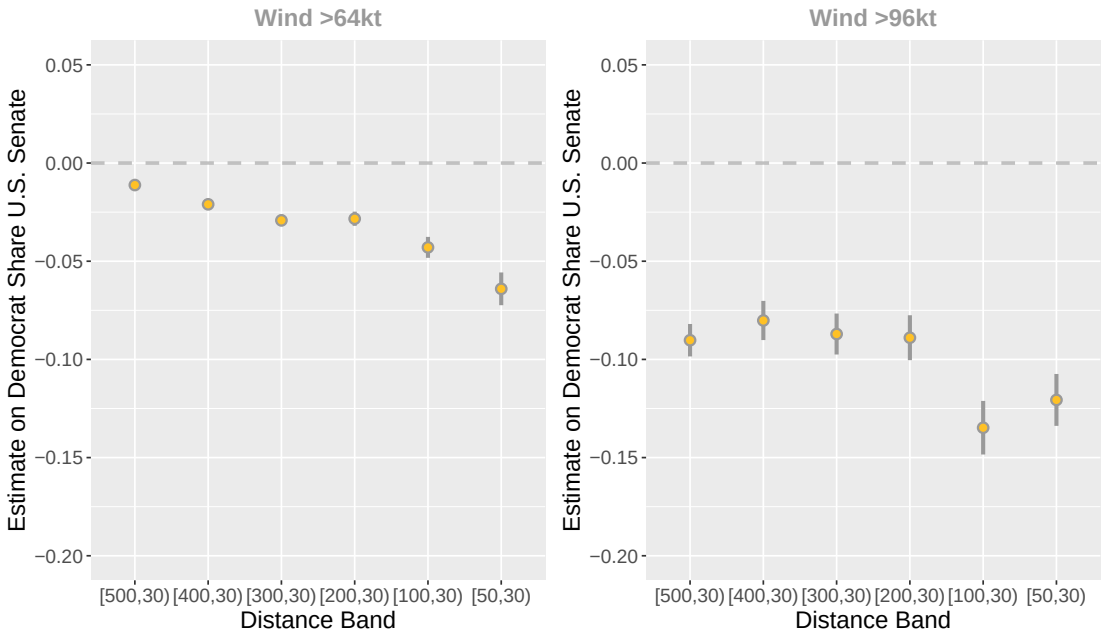
NOTE: Dependent variable, vote share, between 0 and 1. Treatment is binary. Turnout data is provided at county level based on David Leip's Atlas. Estimations based on electoral returns from NC, SC, LA, VA, TX, AL, MS. Standard errors are clustered.

FIGURE III.B.4: ESTIMATED DEMOCRAT SENATE SHARE, PARTISAN REGISTRATION, AND TURNOUT



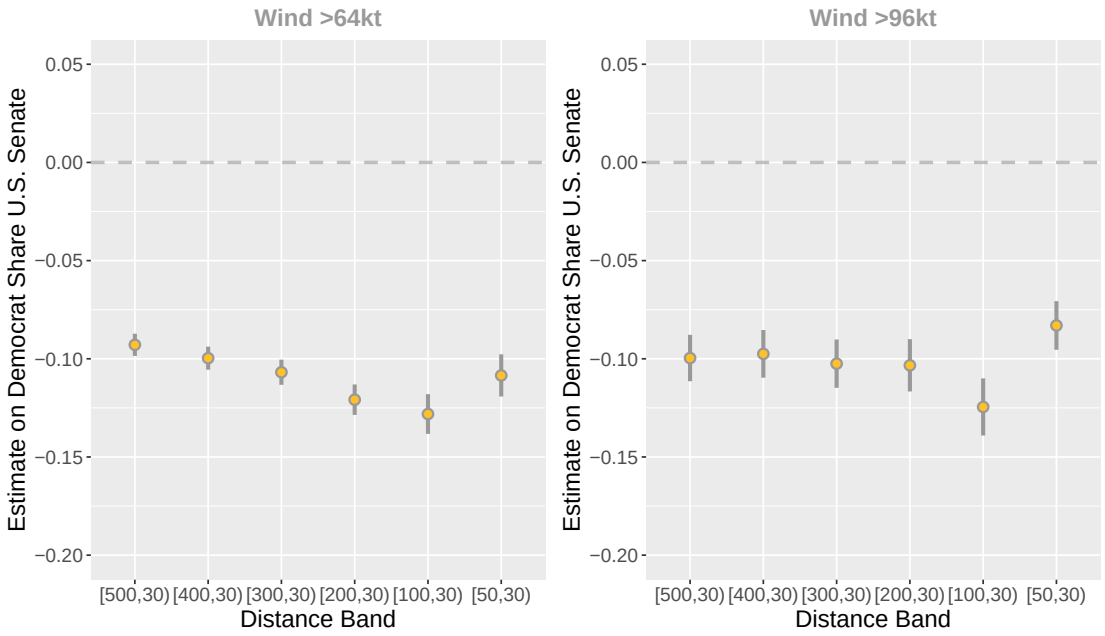
NOTE: Dependent variable, vote share, between 0 and 1. Treatment is binary. Turnout and partisan data is provided at county level based on David Leip's Atlas. Turnout is reported in percentages and partisan participation is calculated as the percentage of Democrat partisans over the total registered number of voters. As not all states report partisan registration, the analysis in these models is based on LA and NC data. Standard errors are clustered.

FIGURE III.B.5: ESTIMATED DEMOCRAT HOUSE SHARE AND TURNOUT



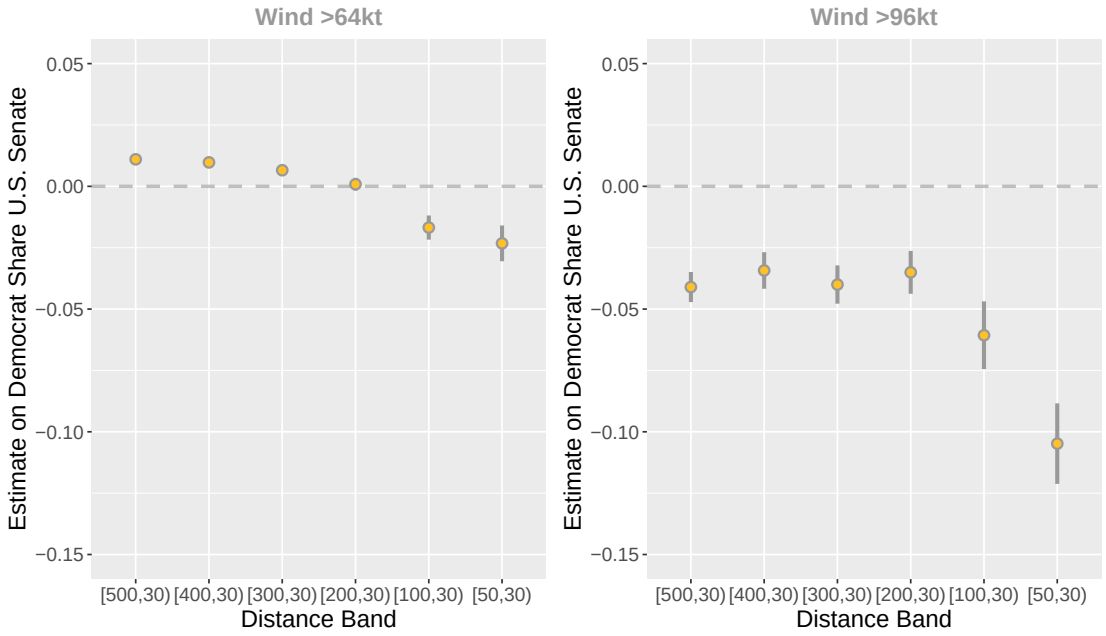
NOTE: Dependent variable, vote share, between 0 and 1. Treatment is binary. Turnout data is provided at county level based on David Leip's Atlas. Estimations based on electoral returns from NC, SC, LA, VA, TX, AL, MS. Standard errors are clustered.

FIGURE III.B.6: ESTIMATED DEMOCRAT HOUSE SHARE, PARTISAN REGISTRATION, AND TURNOUT



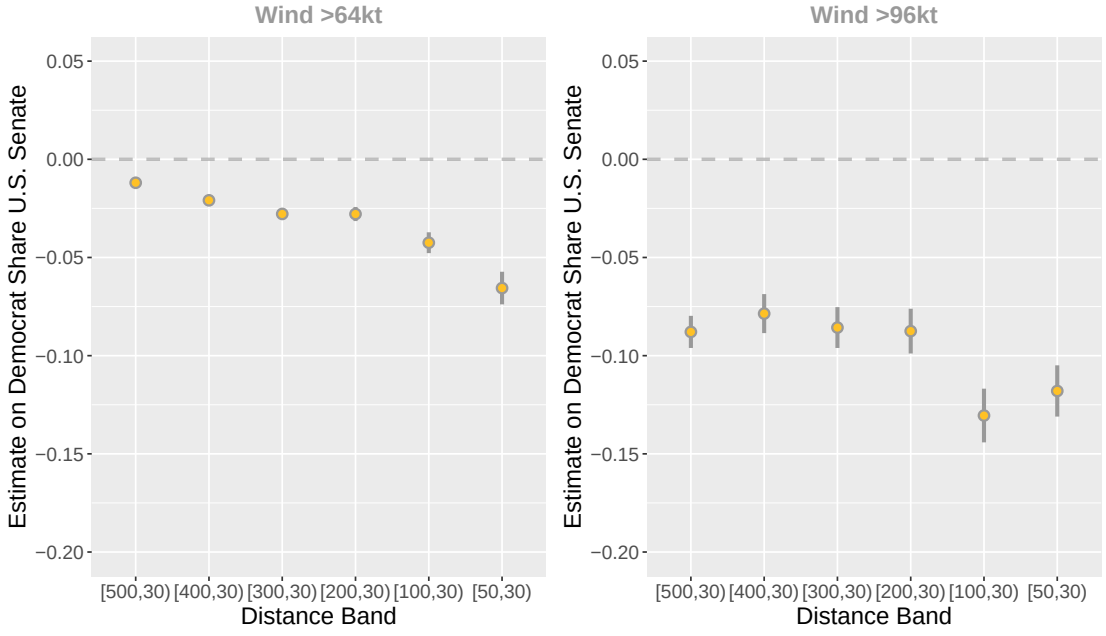
NOTE: Dependent variable, vote share, between 0 and 1. Treatment is binary. Turnout and partisan data is provided at county level based on David Leip's Atlas. Turnout is reported in percentages and partisan participation is calculated as the percentage of Democrat partisans over the total registered number of voters. As not all states report partisan registration, the analysis in these models is based on LA and NC data. Standard errors are clustered.

FIGURE III.B.7: ESTIMATED DEMOCRAT U.S. SENATE SHARE



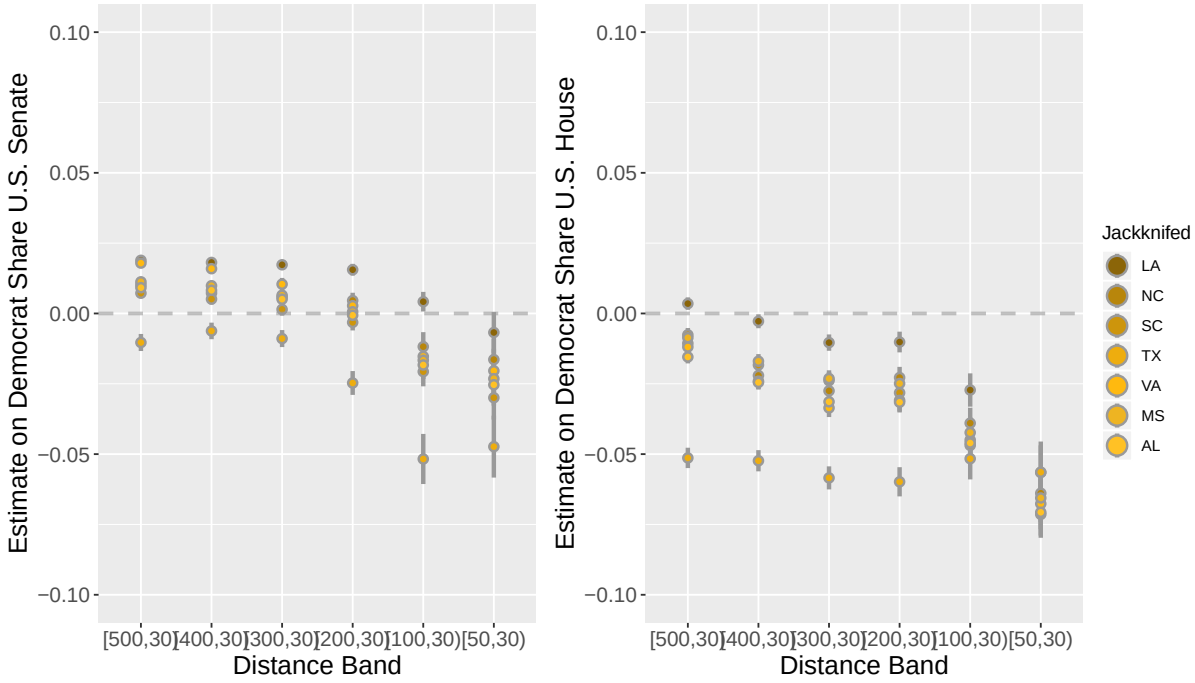
NOTE: Dependent variable, vote share, between 0 and 1. Treatment is binary. Estimations based on electoral returns from NC, SC, LA, VA, TX, AL, MS. Standard errors are clustered by precinct-hurricane.

FIGURE III.B.8: ESTIMATED DEMOCRAT U.S. HOUSE SHARE



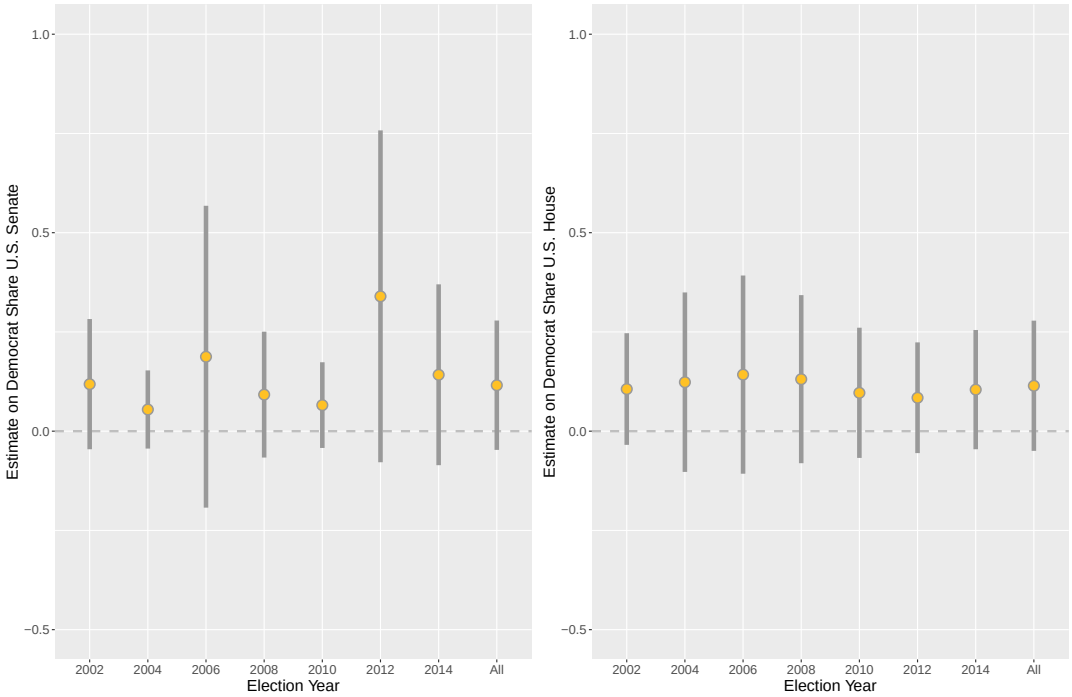
NOTE: Dependent variable, vote share, between 0 and 1. Treatment is binary. Estimations based on electoral returns from NC, SC, LA, VA, TX, AL, MS. Standard errors are clustered by precinct-hurricane.

FIGURE III.B.9: JACKKNIFE ESTIMATES



NOTE: Dependent variable, vote share, between 0 and 1. Treatment is binary. Estimations based on electoral returns from NC, SC, LA, VA, TX, AL, MS. Standard errors are clustered by precinct-hurricane.

FIGURE III.B.10: PLACEBO ESTIMATES



NOTE: Dependent variable, vote share, between 0 and 1. Treatment is binary. Estimations based on electoral returns from NC, SC, LA, VA, TX, AL, MS. Standard errors are clustered by precinct-hurricane. Distance is calculated from placebo hurricanes from TABLE III.A.3.

III.C Appendix C – Risk Aversion: Theory and CCES Data

III.C.1 Stable Preferences?

Individuals face a degree of uncertainty in almost any decision they make across their life. Risk attitudes therefore play a central role in determining an individual's utility from pursuing a certain action. Specifically, risk averse behaviour denotes a preference for a certain and secure although smaller gain over a less certain but potentially higher reward (Kahneman and Tversky, 1984).

Traditionally, individual risk attitudes are assumed to be constant (Stigler and Becker, 1977). Yet, recent empirical evidence suggests quite to the contrary. For example, individuals experiencing economic downturns (Cohn et al., 2015; Malmendier and Nagel, 2011; Guiso et al., 2013; Weber et al., 2012), health shocks (Decker and Schmitz, 2016) or natural disasters (Eckel et al., 2009; Cameron and Shah, 2015) change their risk-taking behaviour across time.

However, a conceptual difficulty emerges in identifying what it means for risk aversion to vary across time. Temporal stability of risk attitudes can either mean that the individual has the same risk attitude over time or that the risk attitude is a stable function of opportunities that change over time (Andersen et al., 2008).[25] Most of the empirical evidence available defines time-variant risk aversion in the former sense. Yet, this relates to an empirical difficulty that this paper signals.

Simply put, existing evidence in favour of time-varying risk aversion also varies other opportunities or factors that are associated with the outcomes of interest or with risk

[25]Specifically, in the latter view, risk attitudes are state-contingent. This means they may depend on the specific state of nature an individual is exposed to, and, consequently vary once the individual's circumstances change.

aversion itself. For example, it may come as no surprise that as an individual's health is deteriorating, her risk-taking behaviour also decreases (Decker and Schmitz, 2016). In order to identify though whether an individual changes risk attitudes over time, other opportunities associated with risk-taking behaviour such as income, education, unemployment or sickness should be kept constant. The failure to recognize this represents a limitation in the existing literature (Alesina and La Ferrara, 2005; Jung, 2015; Dohmen et al., 2011).

In particular, a time-variance component of risk attitudes introduces the problem of endogeneity. Risk attitudes are formed by a time-invariant component (e.g. personality traits, possibly innate, attitudes determined by family background and early childhood experiences) and a time-variant component (associated with shocks and experiences faced by individuals, including but not limited to getting older). Endogeneity becomes problematic to the extent that the time-invariant component determines the time-variant one. If these two components are independent, then over-time changes in willingness to take risks may be explained either by changes in risk preferences or beliefs about future returns (or both) (Malmendier and Nagel, 2011).

III.C.2 Validation

Among the plausibly exogenous factors to risk aversion – age, gender and race – older individuals and women are found more risk averse (Hryshko et al., 2011; Dohmen et al., 2005; Hartog et al., 2000; Kam and Simas, 2010), while whites (the so-called 'white-men' effect) and Asians are found more risk taking (Benjamin et al., 2010; Palmer, 2003; Hryshko et al., 2011). Consistent with this literature, FIGURE III.C.3 reports women to be more risk averse than men, older individuals to be more risk averse (up until around 75 years old) as shown in FIGURE III.C.6 and Asians more risk tolerant (FIGURE III.C.4). There appear to be no significant differences in risk attitudes between

Whites and African Americans in the 2014 CCES sample. As anticipated, risk taking behaviour increases in education and income (Kam and Simas, 2010) as reported in FIGURE III.C.2 and III.C.5.

III.C.3 Specification

I explore the relationship between proximity to a hurricane's path and risk aversion in three ways. Starting with the individual-level estimation in CCES, I estimate:

$$\text{Risk}_{2014} = \alpha_1 + \gamma D_z^{\ell} + \epsilon_3 \tag{III.2}$$

where D_z^{ℓ} represents the distance from each zipcode z to the ℓ's hurricane's path, where distance is defined as in Equation III.1. For robustness, distance is also defined as a multi-category with categories corresponding to j distance bands and as continuous.

Because I employ risk aversion data in only one year (2014), the estimation of γ in equation III.2 is unlikely to capture different treatment intensities considering that hurricanes experienced further away in the past may not be comparable to that of a hurricane experienced recently. This motivates two methods of calculating distances from hurricane ℓ defined as: (i) distance from the strongest hurricane ever experienced, and (ii) distance from the spatially closest hurricane every experienced. All these effects are differentiated between exposure to any hurricane category and exposure specifically from major hurricanes.

III.C.4 Results

I begin by estimating the effect of exposure to the strongest hurricane ever experienced by an individual. The results are reported in TABLE III.C.2. The closer an individual was to the strongest hurricane she ever experienced, the greater her risk

tolerance appears to be in 2014. In fact, an individual within 100 km away from the hurricane is expected to be about 0.4 units (approximatively 20%) more risk loving than those more than 100km away.

In a second treatment specification, I investigate how closeness of exposure to hurricanes alters risk tolerance. Consistent with previous results, closeness increases risk tolerance as TABLE III.C.3 shows. However, given that proximity to a hurricane might have occurred far back in time and it need not have been the strongest ever experienced, one notices that the magnitude of effect is smaller than in the previous specification. Specifically, those within 100km from the hurricane path are found to decrease their risk aversion by 11 units, which amounts to about 5% decrease, compared to the control group.

Following these treatment specifications, it becomes apparent that not only the closeness of the hurricane, but also its intensity matters. TABLE III.C.4 reports the interaction of hurricane intensity with proximity from it. Among those closer to a hurricane, individuals become more risk tolerant as the intensity of the hurricane increases – i.e. at high severity of exposure.

To increase confidence in these results, I test whether future hurricanes influence risk aversion in 2014. TABLE III.A.3 reports the hurricanes considered as placebo (lags). Only hurricanes that made landfall in the US are considered. As FIGURE III.C.10 shows, there are no effects. Also, the distribution of the distance of placebo hurricanes are similar to those from the hurricanes considered in this paper as FIGURES III.C.7 and III.C.8 report.

TABLE III.C.1: CCES SUMMARY STATISTICS

Statistic	N	Mean	St. Dev.	Min	Max
Employed	6,127	0.502	0.500	0	1
Out of Labour Force	6,127	0.429	0.495	0	1
Risk Aversion	6,127	2.067	1.165	0	3
Democrat	3,993	0.571	0.495	0	1
Female	6,127	0.433	0.496	0	1
Age	6,127	59.353	11.718	22	94
Race					
White	6,127	0.846	0.361	0	1
Black	6,127	0.054	0.226	0	1
Hispanic	6,127	0.047	0.211	0	1
Asian	6,127	0.012	0.108	0	1
Native American	6,127	0.006	0.079	0	1
Mixed	6,127	0.014	0.118	0	1
Race: Other	6,127	0.021	0.143	0	1
Education					
No High School	6,127	0.013	0.111	0	1
High School	6,127	0.196	0.397	0	1
Tertiary Education	6,127	0.631	0.483	0	1
Post Graduate	6,127	0.160	0.367	0	1
Income Categories					
Less than $10,000	6,127	0.022	0.148	0	1
$10,000 - $19,999	6,127	0.056	0.231	0	1
$20,000 - $29,999	6,127	0.085	0.279	0	1
$30,000 - $39,999	6,127	0.092	0.289	0	1
$40,000 - $49,999	6,127	0.094	0.291	0	1
$50,000 - $59,999	6,127	0.104	0.306	0	1
$60,000 - $69,999	6,127	0.087	0.282	0	1
$70,000 - $79,999	6,127	0.085	0.279	0	1
$80,000 - $99,999	6,127	0.115	0.320	0	1
$100,000 - $119,999	6,127	0.088	0.284	0	1
$120,000 - $149,999	6,127	0.077	0.267	0	1
$150,000 - $199,999	6,127	0.053	0.224	0	1
$200,000 - $249,999	6,127	0.019	0.135	0	1
>$250,000	6,127	0.022	0.145	0	1
Income Quarters					
Income: Bottom 25%	6,127	0.255	0.436	0	1
Income: 25-50%	6,127	0.285	0.452	0	1
Income: 50-75%	6,127	0.201	0.401	0	1
Income: Top 25%	6,127	0.259	0.438	0	1

TABLE III.C.2: STRONGEST HURRICANE EXPERIENCED IN CCES

	(1)	(2)	(3)	(4)
	< 50km	< 100 km	< 200km	< 500 km
Treatment	-0.464*	-0.416***	-0.269**	.028
	(0.253)	(0.153)	(0.116)	(0.066)
Controls	✓	✓	✓	✓
Observations	3,293	3,293	3,293	3,293
R-squared	0.040	0.041	0.040	0.039
Control Mean	2.081	2.086	2.087	2.083

NOTE: The outcome, risk aversion, is categorical and varies between 0 (risk tolerant) and 3 (risk averse). Controls include age, gender, education, income, race. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1

TABLE III.C.3: CLOSEST HURRICANE EXPERIENCED IN CCES

	(1)	(2)	(3)	(4)
	< 50km	< 100 km	< 200km	< 500 km
Treatment	-0.094	-0.118**	-0.093*	-0.007
	(0.100)	(0.058)	(0.049)	(0.032)
Controls	✓	✓	✓	✓
Observations	6,109	6,109	6,109	6,109
R-squared	0.032	0.032	0.032	0.032
Control Mean	2.071	2.077	2.079	2.081

NOTE: The outcome, risk aversion, is categorical and varies between 0 (risk tolerant) and 3 (risk averse). Controls include age, gender, education, income, race. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1

TABLE III.C.4: INTERACTION EFFECTS DISTANCE AND WIND IN CCES

	(1)	(2)
Distance	−0.005***	−0.004***
	(0.001)	(0.001)
Wind	−0.001***	−0.001***
	(0.0002)	(0.0002)
Distance x Wind	0.0001***	0.00004***
	(0.00001)	(0.00001)
Controls	X	✓
Observations	116,413	116,413
R^2	0.001	0.030

NOTE: The outcome, risk aversion, is categorical and varies between 0 (risk tolerant) and 3 (risk averse). Distance is measured in 100km. Controls include age, gender, education, income, race. *** p<0.01, ** p<0.05, * p<0.1

TABLE III.C.5: REDUCED FORM: STRONGEST HURRICANE EXPOSURE AND DEMOCRAT VOTE

	(1)	(2)
Log Distance	0.045***	0.043***
	(0.014)	(0.013)
Controls	X	✓
Observations	2,112	2,112
R^2	0.005	0.114

NOTE: Dependent variable, Democrat vote, is a binary variable with the value 1 for Democrat. Distance is calculated as the minimum distance to a major hurricane ever experienced in a zipcode. Due to skewness, the log of distance is used and reported. Controls include age, gender, education, income, race. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1

TABLE III.C.6: REDUCED FORM: CLOSEST HURRICANE EXPOSURE AND DEMOCRAT VOTE

	(1)	(2)
Log Distance	0.022***	0.022***
	(0.007)	(0.006)
Controls	X	✓
Observations	3,982	3,982
R^2	0.003	0.097

NOTE: Dependent variable, democrat vote, is a binary variable with the value 1 for Democrat. Distance is calculated as the minimum (closest) distance to a hurricane (i.e. winds of at least 64kt) ever experienced in a zipcode. Due to skewness, the log of distance is used and reported. Controls include age, gender, education, income, race. Robust standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1

FIGURE III.C.1: DISTRIBUTION OF RISK AVERSION IN CCES 2014

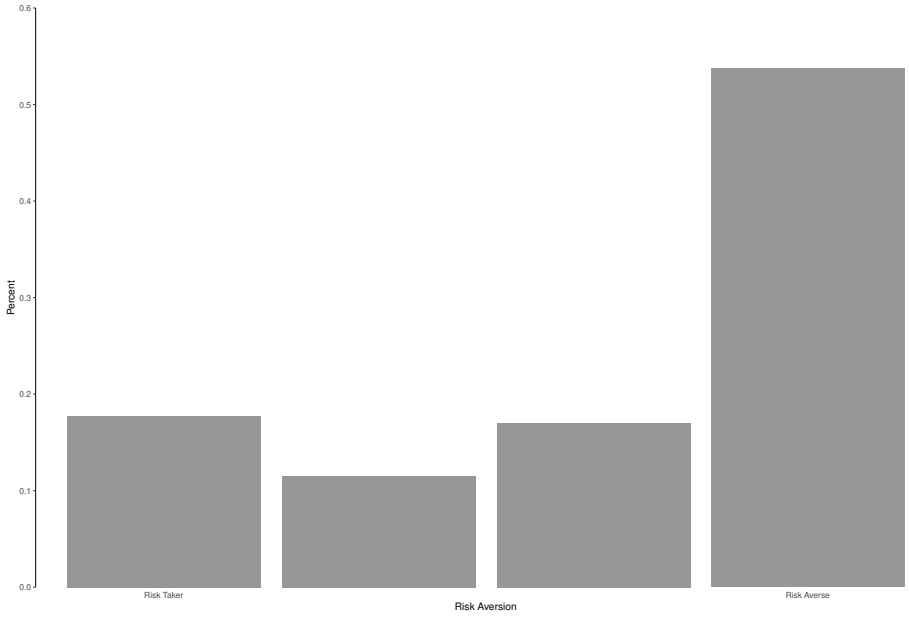


FIGURE III.C.2: DISTRIBUTION OF RISK AVERSION AND EDUCATION IN CCES 2014

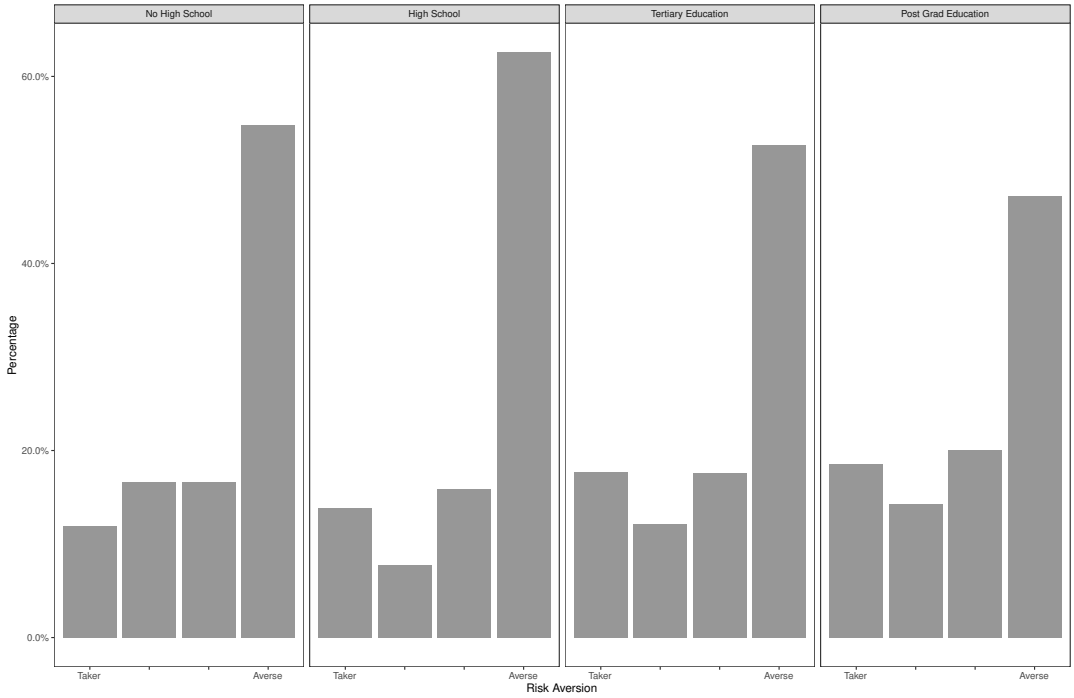


FIGURE III.C.3: DISTRIBUTION OF RISK AVERSION AND GENDER IN CCES 2014

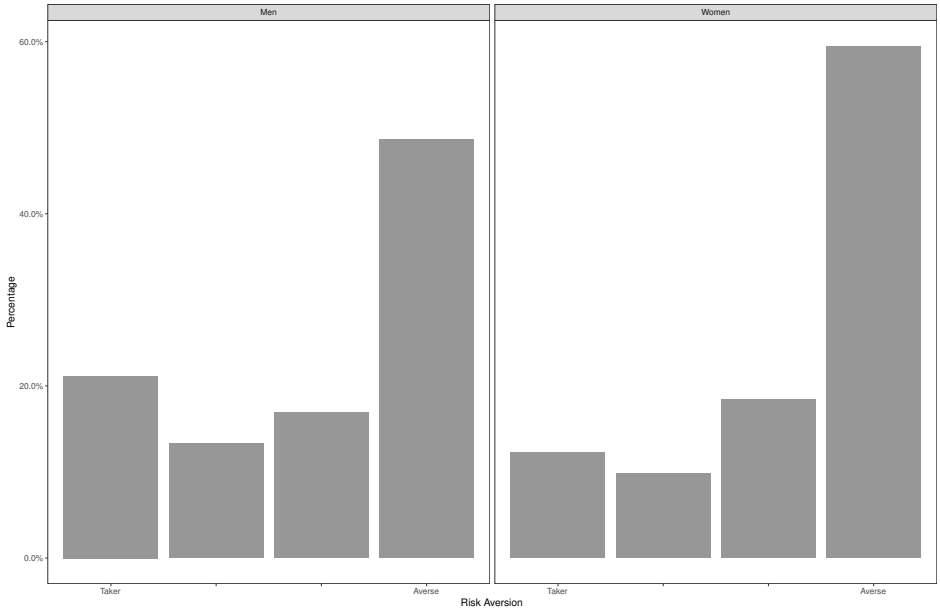


FIGURE III.C.4: DISTRIBUTION OF RISK AVERSION AND RACE IN CCES 2014

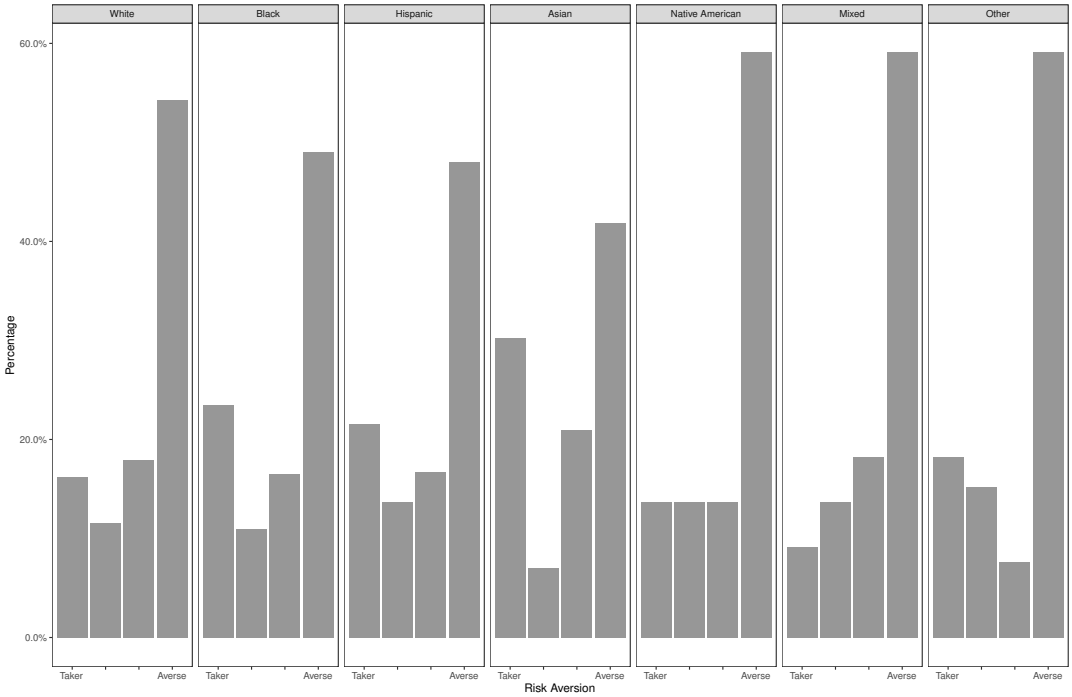


FIGURE III.C.5: DISTRIBUTION OF RISK AVERSION AND INCOME IN CCES 2014

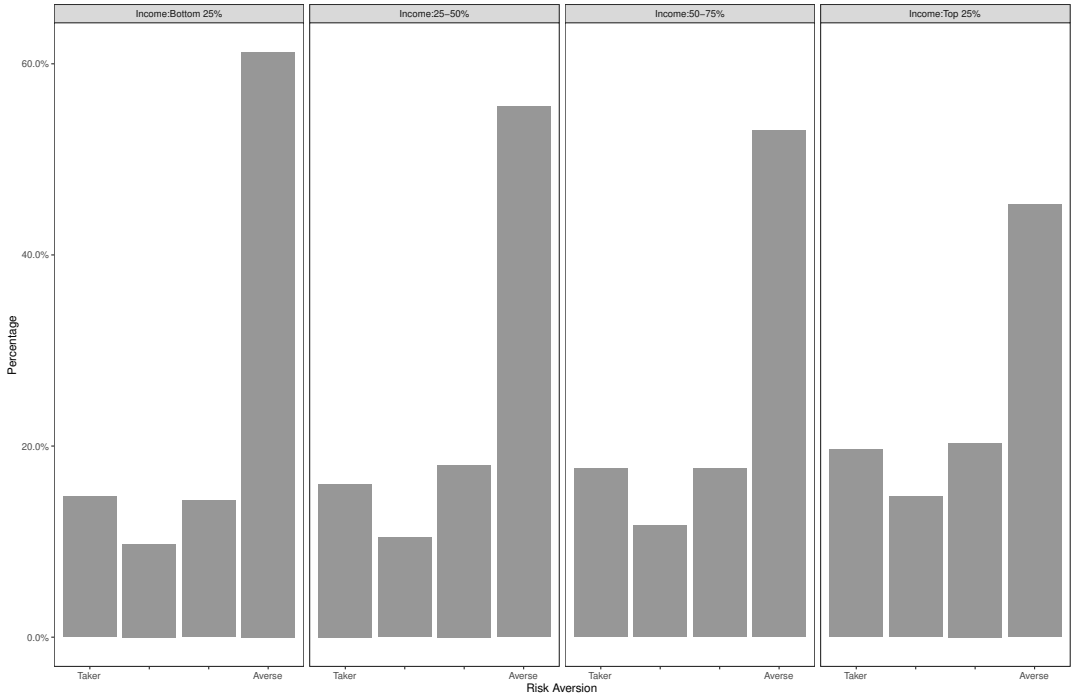


FIGURE III.C.6: DISTRIBUTION OF RISK AVERSION AND AGE IN CCES 2014

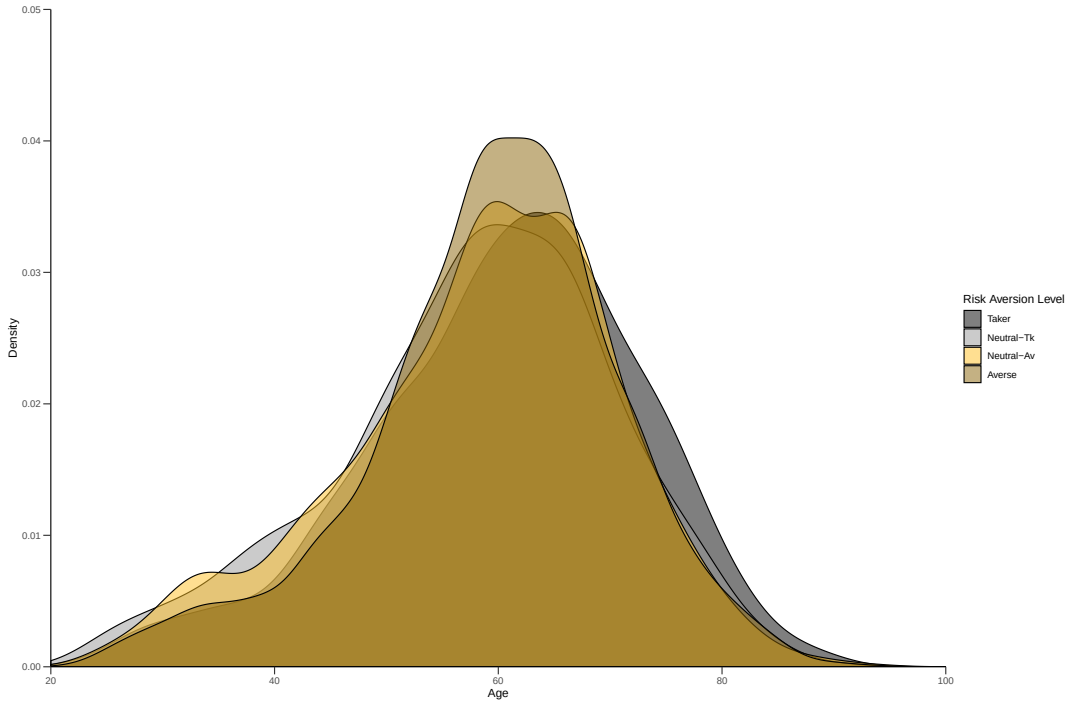
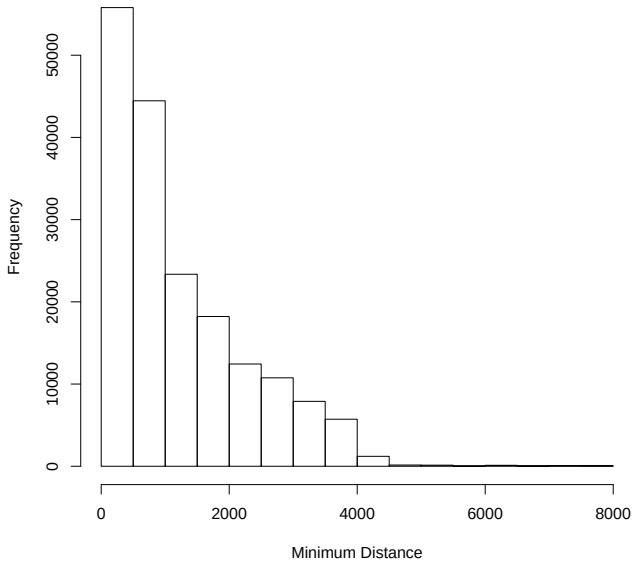
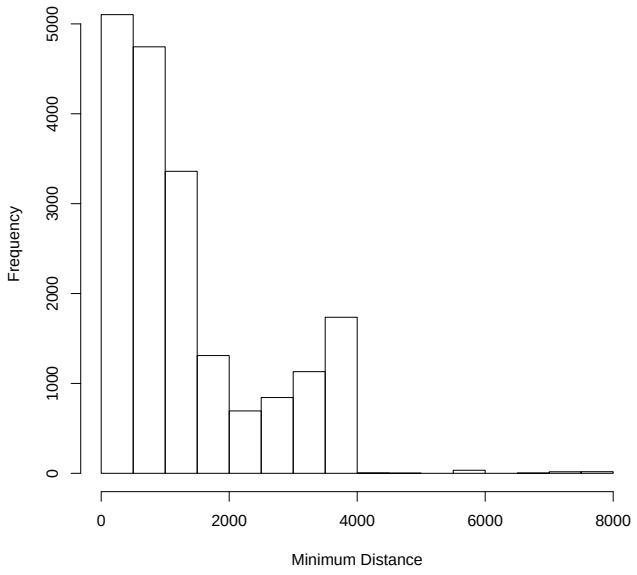


FIGURE III.C.7: DISTRIBUTION OF DISTANCES FROM HURRICANES IN CCES 2014



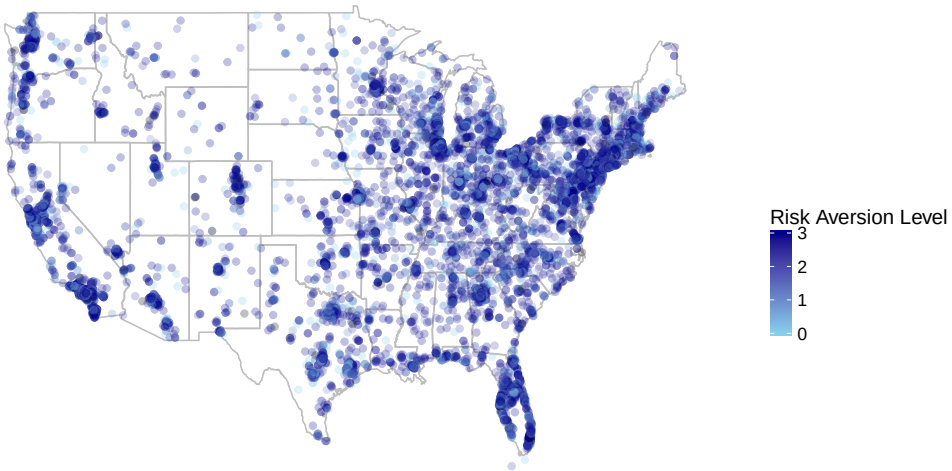
NOTE: DISTANCES FROM HURRICANES CALCULATED AS IN FIGURE III.2.

FIGURE III.C.8: DISTRIBUTION OF DISTANCES FROM PLACEBO HURRICANES IN CCES 2014



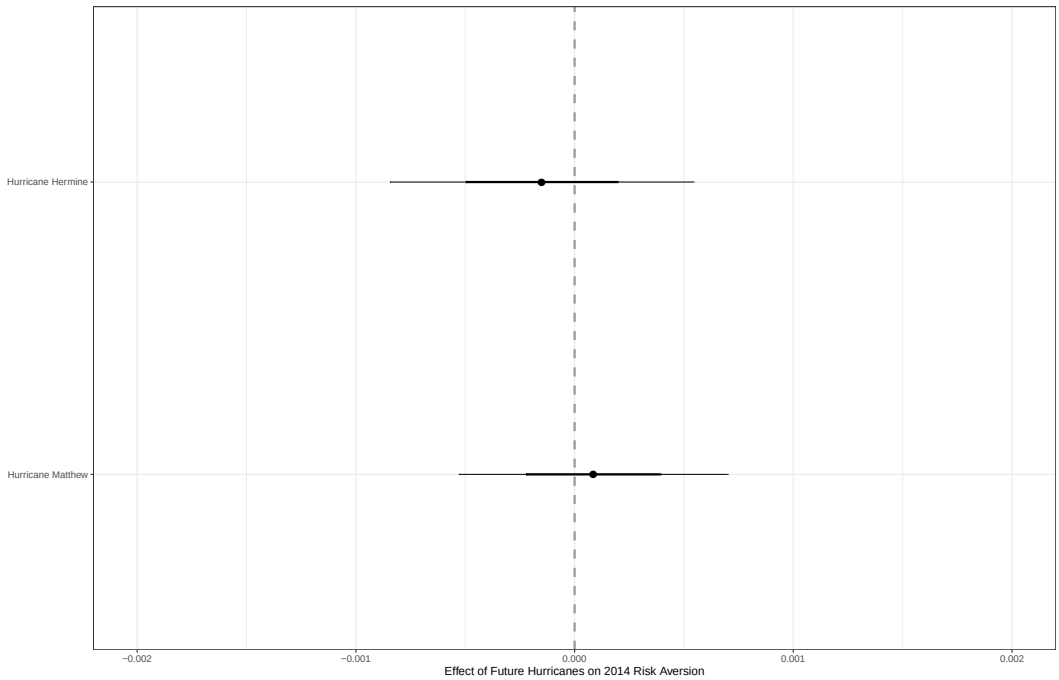
NOTE: DISTANCES FROM HURRICANES CALCULATED AS IN FIGURE III.2.

FIGURE III.C.9: RISK AVERSION BY ZIPCODE



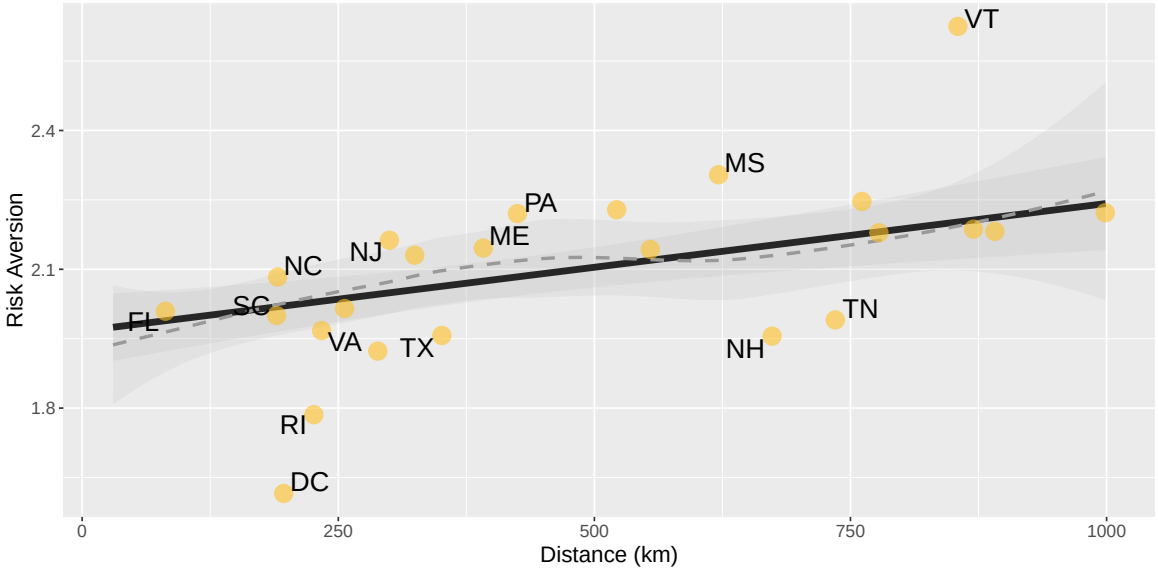
Source: 2014 CCES; Note: Risk aversion varies between 0 (risk-seeking) to 3 (risk averse). Each zipcode-risk aversion level is calculated as the average risk aversion in that zipcode.

FIGURE III.C.10: PLACEBO TEST: DISTANCE FROM FUTURE HURRICANES



NOTE: Models include controls for race, gender, income, education, employment status, age.

FIGURE III.C.11: FIRST STAGE IN CCES CLOSE PROXIMITY



III.D Appendix D – Risk Aversion: Theory and Health and Retirement Study

I complement the CCES estimation by using panel data to estimate within-individual changes in risk aversion. I employ below a similar specification to that in equation III.1 to estimate the effect of distance from hurricane path to risk aversion.

Table III.D.1: HRS Summary Statistics

Statistic	N	Mean	St. Dev.	Min	Max
Risk Aversion	21,953	4.674	1.510	1	6
Education	12,493	1.454	0.924	0.000	3.000
Female	21,953	0.622	0.485	0	1
Age	21,953	56.970	5.398	26	65

Table III.D.2: Correlation Movers and Risk Aversion in HRS

	(1)	(2)	(3)
	Moved 2002 to 2004	Moved 2004 to 2006	Moved 2002 to 2006
Risk Aversion	0.001	-0.006	-0.005
	(0.003)	(0.005)	(0.004)
Observations	3,019	1,064	2,925
R-squared	0.000	0.001	0.001

Note: Dependent variable defined as binary. Risk Aversion measured on a scale from 1 to 6, with higher values denoting higher risk aversion. *** p<0.01, ** p<0.05, * p<0.1

FIGURE III.D.1: DISTRIBUTION OF MINIMUM HURRICANE DISTANCE HRS

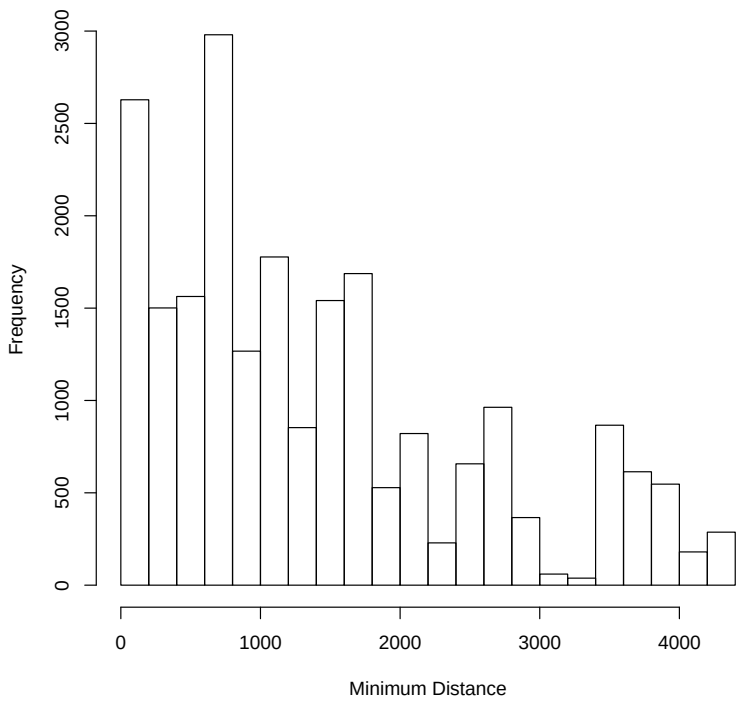


FIGURE III.D.2: DISTRIBUTION OF RISK AVERSION IN HRS

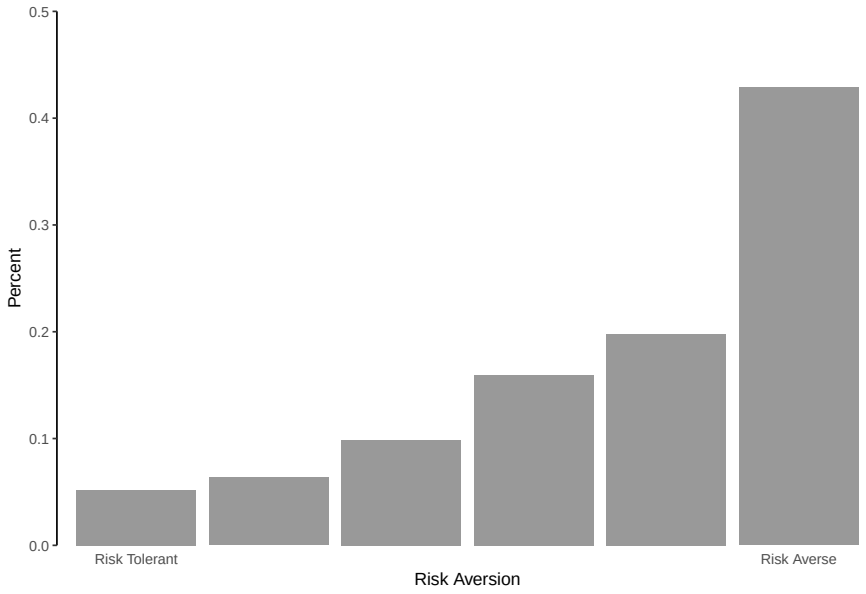


FIGURE III.D.3: DISTRIBUTION OF RISK AVERSION BY GENDER IN HRS

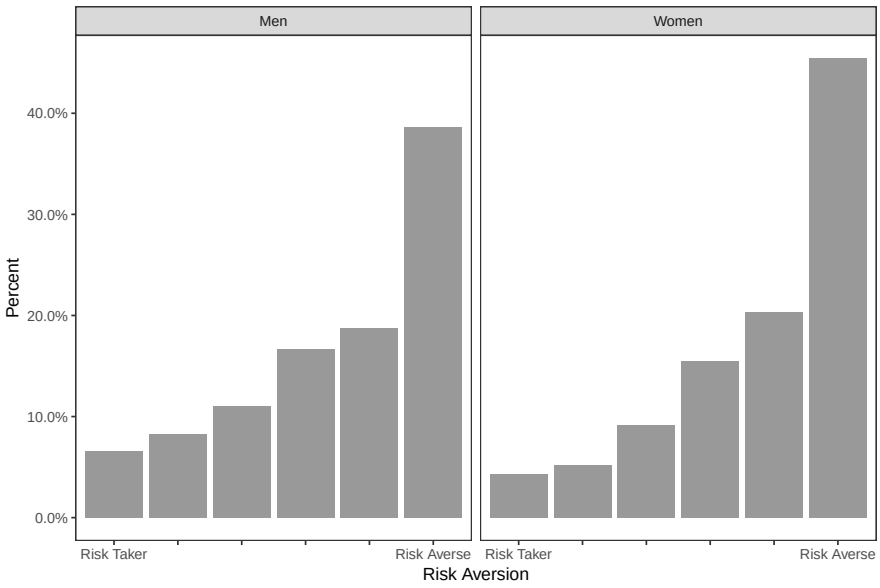


FIGURE III.D.4: DISTRIBUTION OF RISK AVERSION BY AGE IN HRS

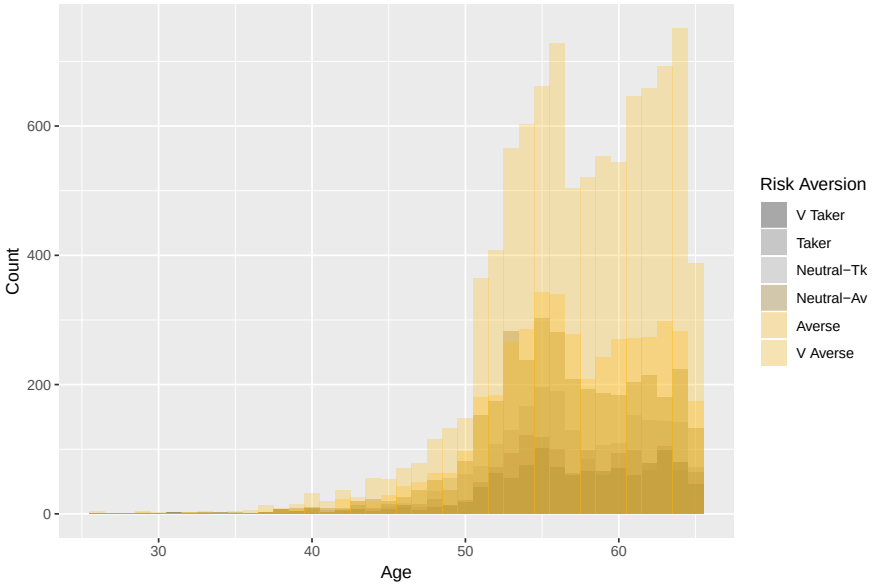
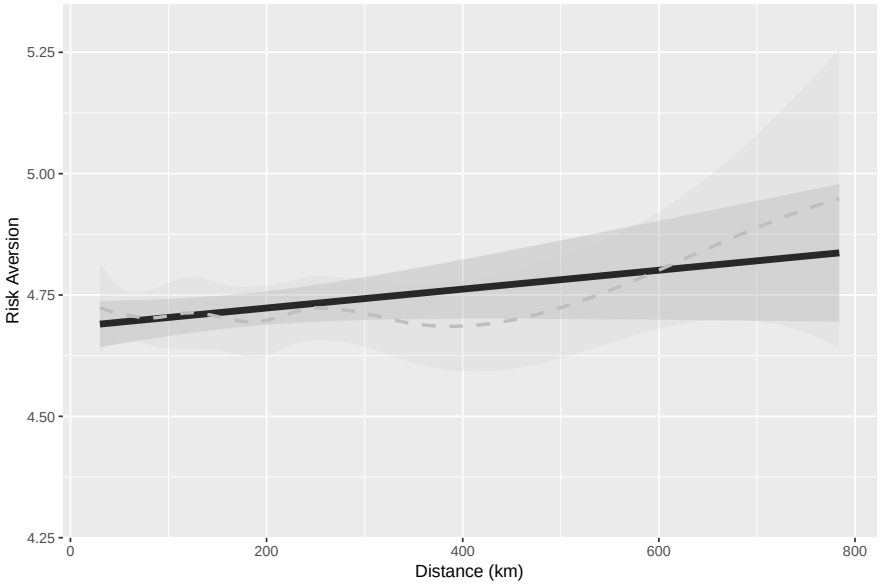


TABLE III.D.3: FIRST STAGE: CLOSEST HURRICANE HRS

	(1) < 300 km	(2) < 400 km	(3) $< 500km$	(4) < 1000 km	(5) < 2000 km	(6) < 3000km	(7) < 4000 km	(8) All
Treatment	-0.171**	-0.128**	-0.150**	-0.089**	-0.014	-0.061	-0.011	
	(0.070)	(0.065)	(0.061)	(0.045)	(0.045)	(0.050)	(0.057	
Distance (log)								0.048**
								(0.023)
Observations	21,953	21,953	21,953	21,953	21,953	21,953	21,953	21,953
R-Squared	0.004	0.004	0.004	0.004	0.003	0.003	0.003	0.004
Number of clusters	14,230	14,230	14,230	14,230	14,230	14,230	14,230	14,230

NOTE: Dependent variable, risk aversion, defined on a scale from 1 to 6 with higher values denoting higher risk aversion. Treatment is defined as binary. Models include individual and time fixed effects. Clustered standard errors in brackets. *** p<0.01, ** p<0.05, * p<0.1

FIGURE III.D.5: FIRST STAGE (POOLED) IN HRS HIGH RISK AREAS



III.E Appendix E – Insurance and Google Trends Data

I further explore the relationship between proximity to hurricanes and risk aversion in the Google Trends data. Unlike the CCES data and more similar to the precinct-level data, GT provides a DMA-level panel data of google searches. Given the nature of the data, one should expect almost concurrent internet search during an exogenous shock (such as a hurricane).[26] Consequently, I estimate the distance from the most recent hurricane experienced from either the month or the week included in the GT sample.[27] Monthly Google Trends were downloaded from IP1 in May-June 2018. Weekly Google Trends were downloaded from IP1 in June-July 2018 and from IP2 in August 2018. More detailed information about the download process are available upon request.

[26]The overlap between data availability and hurricane timings implies that I am able to use all the 19 hurricanes in the CCES analysis and hurricanes 4-17 in the Google Trends analysis. The hurricane numbers are explained in Table III.A.4.

[27]A hurricane is considered most recent even if it occurs at the end of a week for the weekly estimation or of a month for the monthly estimation. This is not problematic because GT index is the average of a week/month searches.

TABLE III.E.1: HURRICANE DISTANCE AND MONTHLY GOOGLE SEARCHES 2004-2015

	(1) Flood Insurance Searches	(2) Life Insurance Searches	(3) Car Insurance Searches	(4) Home Insurance Searches	(5) Health Insurance Searches
Distance	-0.727*	-1.788***	-3.045***	-1.550***	-0.850**
	(0.362)	(0.361)	(0.396)	(0.257)	(0.245)
Google	0.229	0.229	-0.111	0.167	-0.071
	(0.251)	(0.245)	(0.082)	(0.165)	(0.147)
Yahoo	0.160	0.351	0.103	0.219	0.264*
	(0.088)	(0.195)	(0.200)	(0.170)	(0.133)
Bing	0.102	0.401***	0.702***	0.375*	0.433***
	(0.083)	(0.101)	(0.169)	(0.182)	(0.115)
Constant	74.914***	35.727**	100.459***	64.245***	61.787***
	(15.117)	(14.804)	(14.520)	(14.362)	(8.571)
State FE	✓	✓	✓	✓	✓
Month FE	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
State-Month Trends	✓	✓	✓	✓	✓
Observations	647	670	682	636	682
R-squared	0.207	0.250	0.316	0.213	0.242

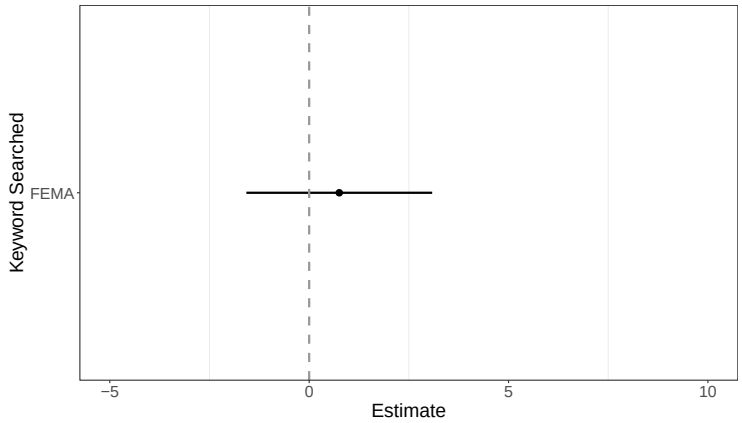
NOTE: The dependent variables are indexes of search frequency normalized to the mean level of searches during the sample period (2004-2015). Distance from any storm level is measured in hundreds. All regressions include state, month and year fixed effects and state-month trends. Clustered standard errors reported in parantheses. *** p<0.01, ** p<0.05, * p<0.1

TABLE III.E.2: HURRICANE DISTANCE AND WEEKLY GOOGLE SEARCHES 2004-2009

	(1) Flood Insurance Searches	(2) Life Insurance Searches	(3) Car Insurance Searches	(4) Home Insurance Searches	(5) Health Insurance Searches
Distance	-0.591**	-0.670**	-0.944***	-0.963***	-0.977***
	(0.177)	(0.240)	(0.157)	(0.229)	(0.223)
Google	0.037	0.099**	0.126***	0.083	0.111**
	(0.028)	(0.032)	(0.026)	(0.072)	(0.044)
Yahoo	0.154***	0.213**	0.221***	0.162**	0.272***
	(0.023)	(0.065)	(0.045)	(0.051)	(0.032)
Bing	0.119***	0.366***	0.319**	0.273***	0.352***
	(0.019)	(0.049)	(0.122)	(0.055)	(0.073)
Constant	81.898***	44.340***	47.290***	59.552***	48.876***
	(1.755)	(6.816)	(6.897)	(3.325)	(6.590)
State FE	✓	✓	✓	✓	✓
Week FE	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓
State-Week Trends	✓	✓	✓	✓	✓
Observations	703	741	741	716	741
R-squared	0.245	0.294	0.317	0.291	0.330

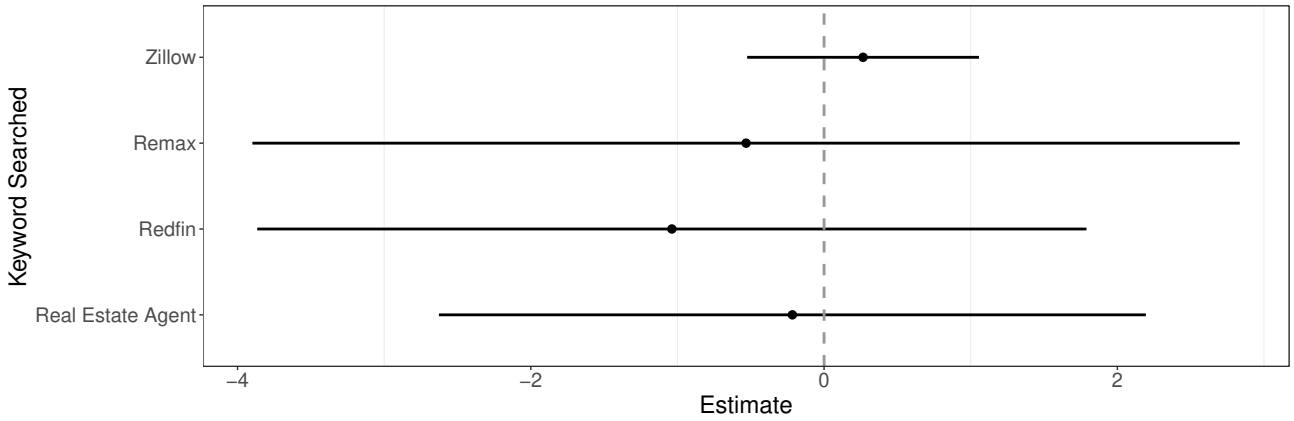
NOTE: The dependent variables are indexes of search frequency normalized to the mean level of searches during the sample period (2004-2009). Distance from any storm level is measured in hundreds. All regressions include state, week and year fixed effects and state-week trends. Clustered standard errors reported in parantheses. *** p<0.01, ** p<0.05, * p<0.1

FIGURE III.E.1: GTRENDS RESULT: HURRICANE PROXIMITY AND FEMA SEARCHES



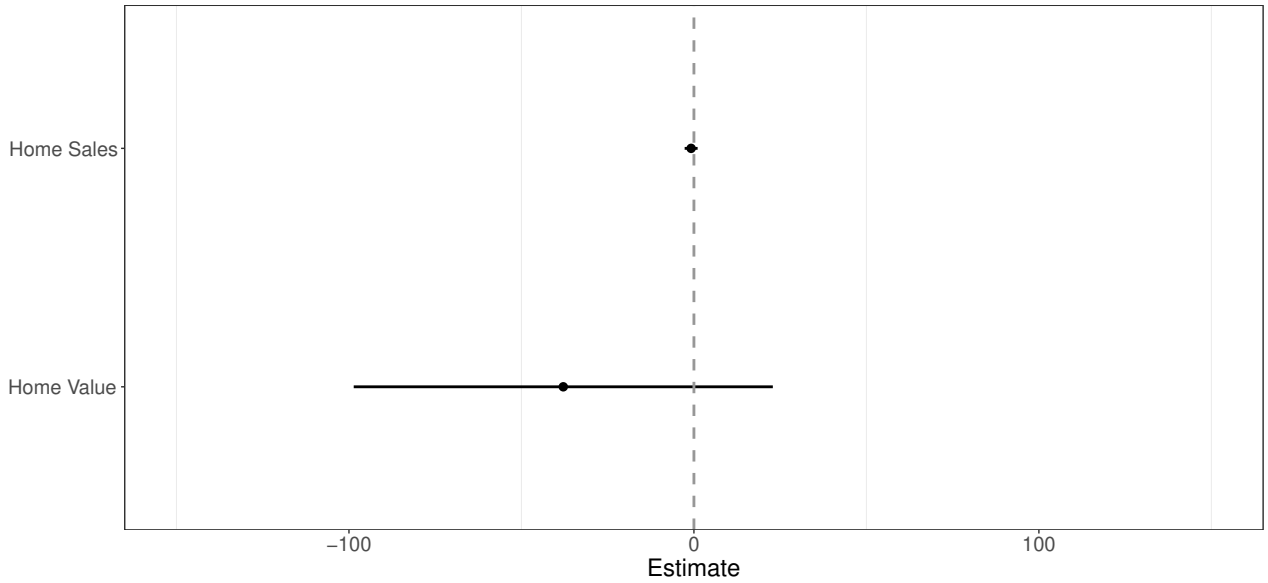
NOTE: The dependent variables is an index of search frequency normalized to the mean level of searches during the sample period (2004-2015). Distance from any storm level is measured in hundreds. The regression includes state, month and year fixed effects and state-month trends. Clustered standard errors reported in parantheses. *** p<0.01, ** p<0.05, * p<0.1

FIGURE III.E.2: GTRENDS RESULT: HURRICANE PROXIMITY AND REAL ESTATE AGENCIES



NOTE: The dependent variables are indexes of search frequency normalized to the mean level of searches during 2004-2015. Data is at DMA level. Estimated models include state and time fixed effects and state trends and distance is in log. Standard errors are clustered.

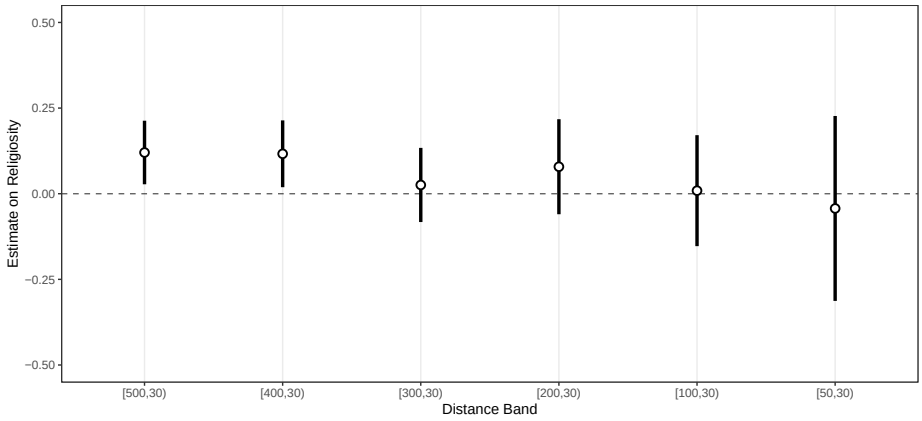
FIGURE III.E.3: ZILLOW DATA RESULT: HURRICANE PROXIMITY AND HOME VALUES AND SALES



NOTE: Data is at county level from 1996 to 2019 (Home Values) and 2008 to 2019 (Home Sales). Estimated models include state and time fixed effects and state trends and distance is in log. Standard errors are clustered. Data source: Zillow.

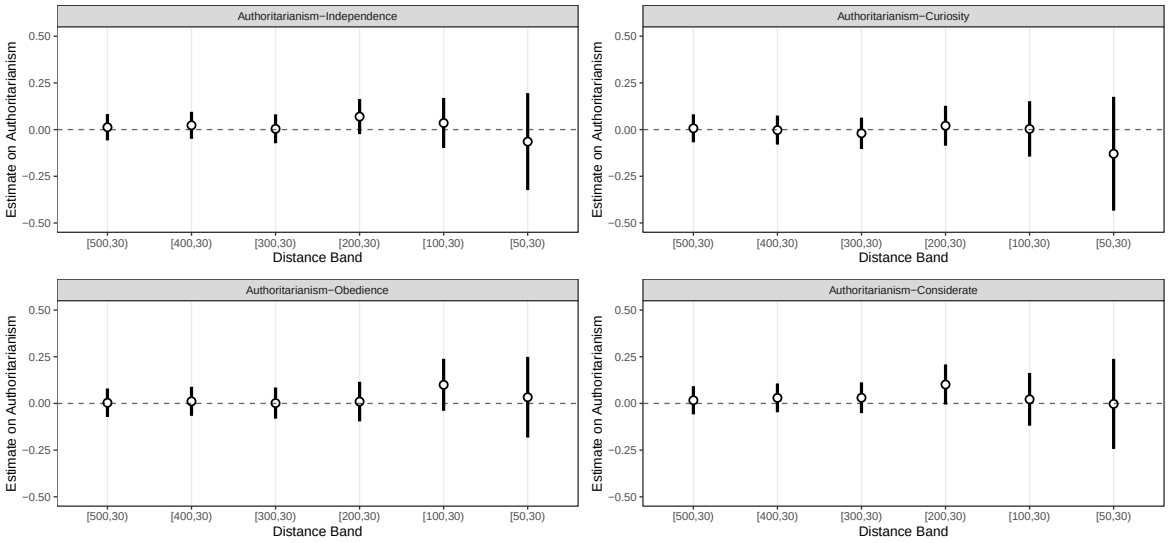
III.F Appendix F – Alternative Mechanisms

FIGURE III.F.1: HURRICANE PROXIMITY AND RELIGIOSITY



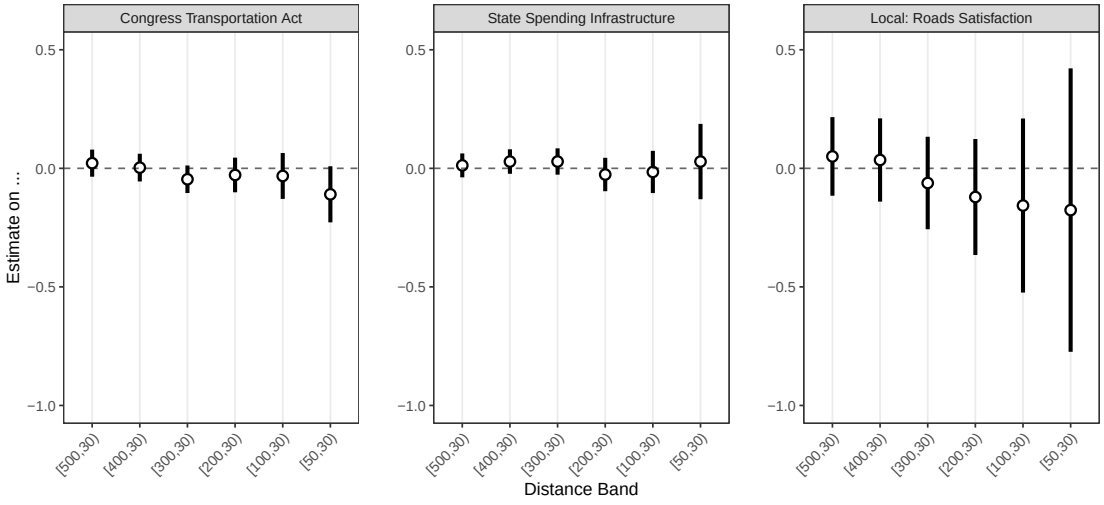
NOTE: The outcome, church attendance, is measured on a 1-6 scale with higher numbers denoting higher religiosity. Models include controls for race, gender, income, education, employment status, age and are based on the 2016 CCES MS Module.

Figure III.F.2: Hurricane Proximity and Authoritarianism



Note: The outcome, authoritarian values, is binary and assesses whether individuals exhibit authoritarian values over independence, curiosity, obedience, consideration. Models include controls for race, gender, income, education, employment status, age and are based on the 2016 CCES MS Module.

Figure III.F.3: Hurricane Proximity and Roads



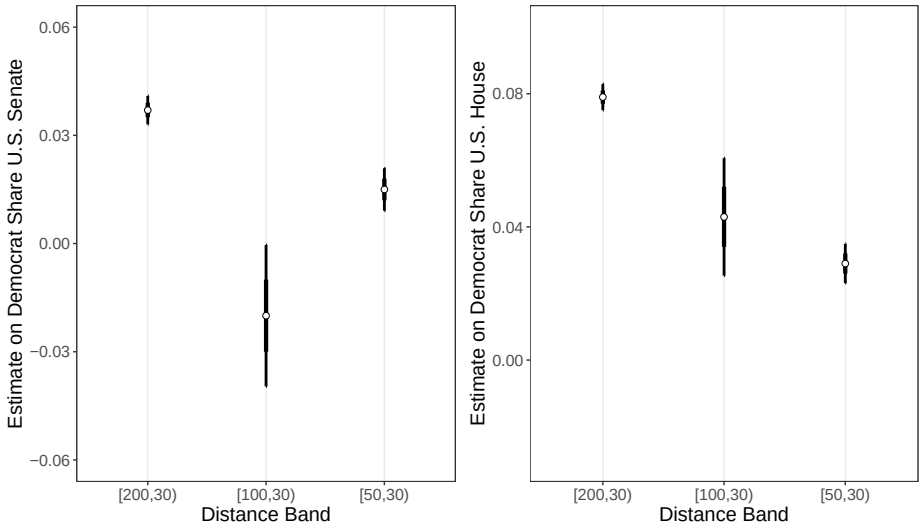
Note: The outcome, support for Congress Transportation Act is binary (for or against), support for state spending infrastructure ranges from 1 (greatly increase) to 5 (greatly decrease) and roads satisfaction ranges from 1 (excellent) to 5 (poor). All models include controls for race, gender, income, education, employment status, age and are based on the 2016 CCES MS Module.

III.G Appendix G – Information, Beliefs, Preferences

Natural disasters and other shocks may represent opportunities for individuals to learn new information about incumbents, governments, the economy or possible future shocks (Ashworth et al., 2018; Eggers, 2014; Malmendier and Nagel, 2011; Eggers and Fouirnaies, 2014; Cameron and Shah, 2015). For example, Ashworth et al. (2018) find that experiencing a disaster provides voters with key information that likely affects their vote choice, while Cameron and Shah (2015) find that individuals perceive the world riskier after a disaster. Similarly, experiencing financial downturns makes individuals more pessimistic about future returns (Malmendier and Nagel, 2011) and increases the perceived risk of future income shocks (Eggers and Fouirnaies, 2014). Repeated exposure to such shocks could then inflict dissonance and individuals living in high-risk areas may not be updating beliefs about the riskiness of their environment or their risk preferences in order to keep it consistent with, for example, their choices to live in these very areas (Festinger, 1962; Bonin et al., 2007). Similarly, repeated exposure could provide certain types of information about the world inaccessible to people who never experience disasters. Information about the riskiness of the environment which makes individuals update, even if incorrectly, risk perceptions and beliefs is not of concern as such information would work through the risk taking behaviour channel. This would be the case, for example, in Cameron and Shah (2015) and Malmendier and Nagel (2011). Information relating for example the incumbents' response to hurricane damage as in Ashworth et al. (2018) would potentially represent an alternative mechanism. In the present case, unlike Ashworth et al. (2018), individuals do not face damages, so being nearly hit should not provide new information about the incumbents' quality. Even if it did, it is unclear that this information would not work through risk perceptions or preferences. In brief, individuals punishing or rewarding incumbents would do so

in the expectation that similar shocks and losses are likely to occur in the future (i.e. updated risk perception) and a better qualified politician would better handle the situation. If it would not affect risk perceptions, then acquiring information could resemble dissonance including, for example, partisans blaming the other party's representatives for the damages as in Malhotra and Kuo (2008). In sum, if nearly hit individuals do acquire information that does not update their risk perceptions and this information is related to the riskiness of their environment (so to repetitive exposures), then uninformed individuals such as those not accustomed to disasters should react differently (either more strongly less strongly or not at all) than individuals in high-risk areas. Similarly, if acquired, information should not affect incumbents' assessment differently based on the party they belong to, a fact which I discuss below.

FIGURE III.G.1: ESTIMATED EFFECT OF HURRICANE IRENE ON NJ DEMOCRAT VOTE SHARE



NOTE: Dependent variable, Democrat vote share, between 0 and 1. Treatment is defined as binary. Distance bands reported only under 200km as within New Jersey the maximum distance from Irene's path is just above 100 km. Standard errors are clustered by precinct-hurricane.

In order to explore these issues, I first make use of longitudinal precinct electoral returns from New Jersey for the period 2002-2012. Hurricane Irene (2011) made landfall

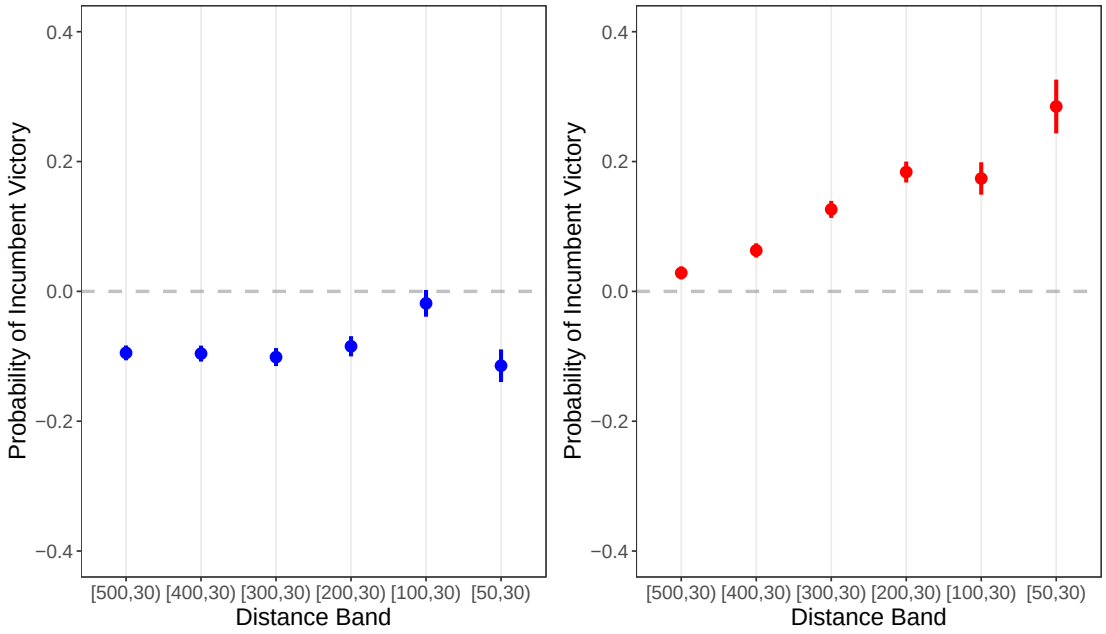
in New Jersey as a category 1 hurricane near Little Egg Inlet, but subsequent sustained winds in the state reached a maximum of 60kt (classifying it as a tropical storm). This was the first hurricane to make landfall since 1903 in New Jersey.[28] Therefore, New Jersey can be considered an atypical state for experiencing hurricanes and in this respect it is expected to be different from states facing repetitive exposures such as Texas. Running the same analysis as in TABLE III.B.2 and III.B.3 in New Jersey would be useful in two respects. First, it helps clarify the role of information and dissonance in risk taking behaviour and vote choice. The analysis complements the results in TABLE III.D.3 that shows individuals choose riskier gambles in times when they are more nearly hit than in times when they are more far away from hurricane paths. If dissonance with respect to risk taking behaviour would be at play, then these results would not be expected. If information however plays a role in dissonance in non-risk taking areas, then we should not expect in New Jersey results similar in spirit to those from the main specifications in high-risk states. Second, because it is an atypical state for disaster exposure, the analysis in New Jersey is useful in deriving out of sample predictions and may increase the results' external validity. Specifically, if the as-if wealth effect that decreases risk aversion is at play, then the mechanism should be validated also on people not accustomed to repetitive exposure to hurricanes, such as individuals living and voting in New Jersey. Broadly, FIGURE III.G.1 supports the main estimates from the high-risk states insofar as proximity to hurricanes appears to mildly decrease Democrat support in the NJ races for US House and Senate. It is noteworthy that hurricane Irene did not maintain hurricane levels across the state, but rather only at landfall. Therefore, the results could have been even stronger if voters were exposed to hurricane winds rather than tropical storm winds.

From the voters' perspective, incumbents provide certainty and therefore there ap-

[28]Source: NOAA and NJ Authorities

pears to be a correlation between more risk averse voters and incumbent support (Eckles et al., 2014). Looking preliminarily at US House elections, I complement their results and entertain the possibility that risk tolerant people are not less supportive of the incumbent, but of *Democrat* incumbents. Previously, TABLE III.D.3 showed that individuals choose riskier gambles in times when they are more nearly hit than in times when they are more far away from hurricane paths. FIGURE III.G.2 shows that Democrat incumbents are consistently less likely to win in near missed precincts than Republican incumbents who benefit from natural disasters. This provides further evidence that vote choices are related to concerns over taxation.

FIGURE III.G.2: HURRICANE PROXIMITY AND INCUMBENT VICTORY IN US HOUSE



NOTE: Dependent variable and treatment are binary. Incumbency is defined as the winning party in the precinct in the previous election. In blue, I report estimates on Democrat incumbents' probability of winning with proximity to hurricanes ($>$ 64kt). In red, I report the Republican incumbents' probability of win based on distance bands from the hurricane paths.

References

Achen, Christopher H and Bartels, Larry M (2004). Blind Retrospection: Electoral Responses to Drought, Flu, and Shark Attacks. *Princeton University Manuscript*.

Achen, Christopher H and Bartels, Larry M (2016). *Democracy for Realists: Why Elections Do Not Produce Responsive Government*. Princeton University Press.

Ahlquist, John, Copelovitch, Mark, and Walter, Stefanie (2020). The Political Consequences of External Economic Shocks: Evidence from Poland. *American Journal of Political Science*.

Alesina, Alberto, Glaeser, Edward, and Sacerdote, Bruce (2001). Why Doesn't the US have a European-style Welfare System? *National Bureau of Economic Research*.

Alesina, Alberto and La Ferrara, Eliana (2005). Preferences for Redistribution in the Land of Opportunities. *Journal of Public Economics*, 89(5-6):897–931.

Amos, Brian, McDonald, Michael P, and Watkins, Russell (2017). When Boundaries Collide: Constructing a National Database of Demographic and Voting Statistics. *Public Opinion Quarterly*, 81(S1):385–400.

Andersen, Steffen, Harrison, Glenn W, Lau, Morten I, and Elisabet Rutström, E (2008). Lost in State Space: Are Preferences Stable? *International Economic Review*, 49(3):1091–1112.

Ansell, Ben (2014). The Political Economy of Ownership: Housing Markets and the Welfare State. *American Political Science Review*, 108(2):383–402.

Ansolabehere, Stephen, Ban, Pamela, and Morse, Michael (2018). Precinct-Level Election Data, 2014. `https://doi.org/10.7910/DVN/B51MPX`.

Ansolabehere, Stephen, Meredith, Marc, and Snowberg, Erik (2014). Macro-Economic Voting: Local Information and Micro-Perceptions of the Macro-Economy. *Economics & Politics*, 26(3):380–410.

Ansolabehere, Stephen, Palmer, Maxwell, and Lee, Amanda (2015). Precinct-Level Election Data, 2002-2012. `https://doi.org/10.7910/DVN/YN4TLR`.

Ashworth, Scott, Bueno de Mesquita, Ethan, and Friedenberg, Amanda (2018). Learning about Voter Rationality. *American Journal of Political Science*, 62(1):37–54.

Assandri, Matteo, Maffioletti, Anna, Piacenza, Massimiliano, and Turati, Gilberto (2017). Risk Attitudes and Preferences for Redistribution: New Evidence from the Lab. *CESifo Economic Studies*.

Barr, Nicholas Adrian (2001). *The Welfare State as Piggy Bank: Information, Risk, Uncertainty, and the Role of the State*. Oxford University Press.

Barsky, Robert B, Juster, F Thomas, Kimball, Miles S, and Shapiro, Matthew D (1997). Preference Parameters and Behavioral Heterogeneity: An Experimental Approach in the Health and Retirement Study. *Quarterly Journal of Economics*, 112(2):537–579.

Bartels, Larry M (2005). Homer Gets a Tax Cut: Inequality and Public Policy in the American Mind. *Perspectives on Politics*, 3(1):15–31.

Bechtel, Michael M and Hainmueller, Jens (2011). How Lasting Is Voter Gratitude? An Analysis of the Short-and Long-Term Electoral Returns to Beneficial Policy. *American Journal of Political Science*, 55(4):852–868.

Benjamin, Daniel J, Choi, James J, and Strickland, A Joshua (2010). Social Identity and Preferences. *American Economic Review*, 100(4):1913–28.

Blake, Eric S and Gibney, Ethan J. (2011). *The Deadliest, Costliest, and Most Intense United States Tropical Cyclones from 1851 to 2010 (and Other Frequently Requested Hurricane Facts)*. NOAA. `https://www.nhc.noaa.gov/pdf/nws-nhc-6.pdf`.

Bonin, Holger, Dohmen, Thomas, Falk, Armin, Huffman, David, and Sunde, Uwe (2007). Cross-sectional Earnings Risk and Occupational Sorting: The Role of Risk Attitudes. *Labour Economics*, 14(6):926–937.

Busemeyer, Marius R and Iversen, Torben (2020). The Welfare State with Private Alternatives: The Transformation of Popular Support for Social Insurance. *The Journal of Politics*, 82(2):671–686.

Cameron, Lisa and Shah, Manisha (2015). Risk-Taking Behavior in the Wake of Natural Disasters. *Journal of Human Resources*, 50(2):484–515.

Campello, Daniela and Zucco Jr, Cesar (2015). Presidential Success and The World Economy. *Journal of Politics*, 78(2):589–602.

Cheng, Terence and Vahid, Farshid (2011). Demand for Hospital Care and Private Health Insurance in a Mixed Public-Private System: Empirical Evidence using a Simultaneous Equation Modeling Approach. `https://ssrn.com/abstract=1752581`.

Choi, Hyunyoung and Varian, Hal (2012). Predicting the Present with Google Trends. *Economic Record*, 88(s1):2–9.

Cohn, Alain, Engelmann, Jan, Fehr, Ernst, and Maréchal, Michel André (2015). Evidence for Countercyclical Risk Aversion: An Experiment with Financial Professionals. *American Economic Review*, 105(2):860–85.

Cook, Philip J and Graham, Daniel A (1977). The Demand for Insurance and Protection: The Case of Irreplaceable Commodities. *Quarterly Journal of Economics*, 91(1):143–156.

Currie, Janet and Rossin-Slater, Maya (2013). Weathering the Storm: Hurricanes and Birth Outcomes. *Journal of Health Economics*, 32(3):487–503.

Decker, Simon and Schmitz, Hendrik (2016). Health Shocks and Risk Aversion. *Journal of Health Economics*, 50:156–170.

Dohmen, Thomas, Falk, Armin, Huffman, David, Sunde, Uwe, Schupp, Jürgen, and Wagner, Gert G (2011). Individual Risk Attitudes: Measurement, Determinants, and Behavioral Consequences. *Journal of the European Economic Association*, 9(3):522–550.

Dohmen, Thomas J, Falk, Armin, Huffman, David, Sunde, Uwe, Schupp, Jürgen, and Wagner, Gert G (2005). Individual Risk Attitudes: New Evidence from a Large, Representative, Experimentally-Validated Survey. *Institute for the Study of Labor Discussion Paper 1730*.

Dowling, Conor (2019). CCES 2016, Team Module of University of Mississippi. `https://doi.org/10.7910/DVN/0JIMKY`.

Downs, Anthony (1957). An Economic Theory of Democracy. *New York: Harper*.

Duch, Raymond M and Rueda, David (2015). The People You Are: Personality Traits as Determinants of Redistribution Preferences. `https://ssrn.com/abstract=2840433`.

Duch, Raymond M and Stevenson, Randolph T (2008). *The Economic Vote: How Political and Economic Institutions Condition Election Results*. Cambridge University Press.

Durante, Ruben, Putterman, Louis, and Van der Weele, Joël (2014). Preferences for Redistribution and Perception of Fairness: An Experimental Study. *Journal of the European Economic Association*, 12(4):1059–1086.

Eckel, Catherine C, El-Gamal, Mahmoud A, and Wilson, Rick K (2009). Risk Loving after the Storm: A Bayesian-Network Study of Hurricane Katrina Evacuees. *Journal of Economic Behavior & Organization*, 69(2):110–124.

Eckles, David L, Kam, Cindy D, Maestas, Cherie L, and Schaffner, Brian F (2014). Risk Attitudes and the Incumbency Advantage. *Political Behavior*, 36(4):731–749.

Eggers, Andrew C (2014). Partisanship and Electoral Accountability: Evidence from the UK Expenses Scandal. *Quarterly Journal of Political Science*, 9(4):441–472.

Eggers, Andrew C. and Fouirnaies, Alexander B. (2014). The Economic Impact of Economic News. *Mimeo, Nuffield College*. `http://andy.egge.rs/papers/Eggers_Fouirnaies_Recessions.pdf`.

Fearon, James D (1999). Electoral Accountability and the Control of Politicians: Selecting Good Types versus Sanctioning Poor Performance. In Bernard Manin, Adam Przeworski and Stokes, Susan, editors, *Democracy, Accountability, and Representation*. Cambridge University Press.

Feigenbaum, James J and Hall, Andrew B (2015). How Legislators Respond to Localized Economic Shocks: Evidence from Chinese Import Competition. *Journal of Politics*, 77(4):1012–1030.

Festinger, Leon (1962). *A Theory of Cognitive Dissonance*. Stanford University Press.

Flores, Alejandro Quiroz and Smith, Alastair (2013). Leader Survival and Natural Disasters. *British Journal of Political Science*, 43(4):821–843.

Gallagher, Justin (2014). Learning about an Infrequent Event: Evidence from Flood Insurance Take-Up in the United States. *American Economic Journal: Applied Economics*, pages 206–233.

Gärtner, Manja, Mollerstrom, Johanna, and Seim, David (2017). Individual Risk Preferences and the Demand for Redistribution. *Journal of Public Economics*, 153:49–55.

Gartner, Scott Sigmund (2008). Ties to the Dead: Connections to Iraq War and 9/11 Casualties and Disapproval of the President. *American Sociological Review*, 73(4):690–695.

Gasper, John T and Reeves, Andrew (2011). Make it Rain? Retrospection and the Attentive Electorate in the Context of Natural Disasters. *American Journal of Political Science*, 55(2):340–355.

Getmansky, Anna and Zeitzoff, Thomas (2014). Terrorism and Voting: The Effect of Rocket Threat on Voting in Israeli Elections. *American Political Science Review*, 108(3):588–604.

Gomez, Brad T and Wilson, J Matthew (2006). Cognitive Heterogeneity and Economic Voting: A Comparative Analysis of Four Democratic Electorates. *American Journal of Political Science*, 50(1):127–145.

Guiso, Luigi, Sapienza, Paola, and Zingales, Luigi (2013). Time Varying Risk Aversion. *National Bureau of Economic Research*. `https://www.nber.org/papers/w19284`.

Hacker, Jacob S (2019). *The Great Risk Shift: The New Economic Insecurity and the Decline of the American Dream*. Oxford University Press.

Hall, Andrew B and Yoder, Jesse (2019). Does Homeownership Influence Political Behavior? Evidence from Administrative Data. *Mimeo, Stanford University.* `http://www.andrewbenjaminhall.com/homeowner.pdf`.

Hanaoka, Chie, Shigeoka, Hitoshi, and Watanabe, Yasutora (2018). Do Risk Preferences Change? Evidence from Panel Data Before and After the Great East Japan Earthquake. *American Economic Journal: Applied Economics*, 10(2):298–330.

Hartog, Joop, Ferrer-i Carbonell, Ada, and Jonker, Nicole (2000). On a Simple Survey Measure of Individual Risk Aversion. `https://ssrn.com/abstract=260938`.

Healy, Andrew and Malhotra, Neil (2009). Myopic Voters and Natural Disaster Policy. *American Political Science Review*, 103(3):387–406.

Healy, Andrew J, Persson, Mikael, and Snowberg, Erik (2017). Digging into the Pocketbook: Evidence on Economic Voting from Income Registry Data Matched to a Voter Survey. *American Political Science Review*, 111(4):771–785.

Hetherington, Marc and Suhay, Elizabeth (2011). Authoritarianism, Threat, and Americans' Support for the War on Terror. *American Journal of Political Science*, 55(3):546–560.

Hetherington, Marc J and Weiler, Jonathan D (2009). *Authoritarianism and Polarization in American Politics.* Cambridge University Press.

Hilt, Eric and Rahn, Wendy M (2018). Financial Asset Ownership and Political Partisanship: Liberty Bonds and Republican Electoral Success in the 1920s. *National Bureau of Economic Research.* `https://www.nber.org/papers/w24719`.

Hryshko, Dmytro, Luengo-Prado, María José, and Sørensen, Bent E (2011). Childhood Determinants of Risk Aversion: The Long Shadow of Compulsory Education. *Quantitative Economics*, 2(1):37–72.

Huber, Gregory A, Hill, Seth J, and Lenz, Gabriel S (2012). Sources of Bias in Retrospective Decision Making: Experimental Evidence on Voters' Limitations in Controlling Incumbents. *American Political Science Review*, 106(4):720–741.

Iversen, Torben and Soskice, David (2001). An Asset Theory of Social Policy Preferences. *American Political Science Review*, 95(4):875–893.

Jacoby, William G (2000). Issue Framing and Public Opinion on Government Spending. *American Journal of Political Science*, 44(4):750–767.

Jerzak, Connor T and Libgober, Brian (2020). The Impact of Transportation Policy on Electoral Politics: Evidence from E-ZPass. *Research in Transportation Economics.*

Jung, Seeun (2015). Does Education Affect Risk Aversion? Evidence from the British Education Reform. *Applied Economics*, 47(28):2924–2938.

Kahneman, Daniel and Tversky, Amos (1984). Choices, Values, and Frames. *American Psychologist*, 39(4):341.

Kam, Cindy D and Simas, Elizabeth N (2010). Risk Orientations and Policy Frames. *Journal of Politics*, 72(2):381–396.

Karbownik, Krzysztof and Wray, Anthony (2019). Long-run Consequences of Exposure to Natural Disasters. *Journal of Labour Economics*, 37(3):949–1007.

Key, Valdimer Orlando (1966). *The Responsible Electorate*. Harvard University Press.

Kramer, Gerald H (1971). Short-term Fluctuations in US Voting Behavior, 1896–1964. *American Political Science Review*, 65(1):131–143.

Leip, Dave (2017). Dave Leip Voter Registration and Turnout Data by County. `https://doi.org/10.7910/DVN/WRSW25`.

Malhotra, Neil and Kuo, Alexander G (2008). Attributing Blame: The Public's Response to Hurricane Katrina. *Journal of Politics*, 70(1):120–135.

Malmendier, Ulrike and Nagel, Stefan (2011). Depression Babies: Do Macroeconomic Experiences Affect Risk Taking? *Quarterly Journal of Economics*, 126(1):373–416.

Margalit, Yotam (2013). Explaining Social Policy Preferences: Evidence from the Great Recession. *American Political Science Review*, 107(1):80–103.

McCarty, Nolan, Poole, Keith T, and Rosenthal, Howard (2016). *Polarized America: The Dance of Ideology and Unequal Riches*. MIT Press.

Meltzer, Allan H and Richard, Scott F (1981). A Rational Theory of the Size of Government. *Journal of Political Economy*, 89(5):914–927.

Montalvo, Jose G (2011). Voting after the Bombings: A Natural Experiment on the Effect of Terrorist Attacks on Democratic Elections. *Review of Economics and Statistics*, 93(4):1146–1154.

Mossin, Jan (1968). Aspects of Rational Insurance Purchasing. *Journal of Political Economy*, 76:553–568.

O'Grady, Tom (2019). How do Economic Circumstances Determine Preferences? Evidence from Long-Run Panel Data. *British Journal of Political Science*, 49(4):1–26.

Page, Lionel, Savage, David A, and Torgler, Benno (2014). Variation in Risk Seeking Behaviour Following Large Losses: A Natural Experiment. *European Economic Review*, 71:121–131.

Pahontu, Raluca L. (2019). Divisive Jobs: Three Facets of Risk, Precarity and Redistribution. `https://ssrn.com/abstract=3208111`.

Pahontu, Raluca. L (2020). US Counties Geographical Correspondence and Crosswalk. https://doi.org/10.7910/DVN/Z4YTA6.

Palmer, Christina (2003). Risk Perception: Another Look at the 'White Male' Effect. *Health, Risk & Society*, 5(1):71–83.

Pape, Robert A (2003). The Strategic Logic of Suicide Terrorism. *American Political Science Review*, 97(3):343–361.

Petrocik, John R (1996). Issue Ownership in Presidential Elections, with a 1980 Case Study. *American Journal of Political Science*, 40:825–850.

Rehm, Philipp (2009). Risks and Redistribution: An Individual-level Analysis. *Comparative Political Studies*, 42(7):855–881.

Rehm, Philipp (2011). Risk Inequality and the Polarized American Electorate. *British Journal of Political Science*, 41(2):363–387.

Rehm, Philipp, Hacker, Jacob S, and Schlesinger, Mark (2012). Insecure Alliances: Risk, Inequality, and Support for the Welfare State. *American Political Science Review*, 106(2):386–406.

Remmer, Karen L (2014). Exogenous Shocks and Democratic Accountability: Evidence from the Caribbean. *Comparative Political Studies*, 47(8):1158–1185.

Rueda, David and Stegmueller, Daniel (2016). The Externalities of Inequality: Fear of Crime and Preferences for Redistribution in Western Europe. *American Journal of Political Science*, 60(2):472–489.

Rueda, David and Stegmueller, Daniel (2019). *Who Wants What?: Redistribution Preferences in Comparative Perspective*. Cambridge University Press.

Scheve, Kenneth, Stasavage, David, et al. (2006). Religion and Preferences for Social Insurance. *Quarterly Journal of Political Science*, 1(3):255–286.

Sinding Bentzen, Jeanet (2019). Acts of God? Religiosity and Natural Disasters across Subnational World Districts. *The Economic Journal*, 129(622):2295–2321.

Sood, Gaurav (2018). Geographic Information on Designated Media Markets. https://doi.org/10.7910/DVN/IVXEHT.

Stigler, George J and Becker, Gary S (1977). De Gustibus Non Est Disputandum. *American Economic Review*, 67(2):76–90.

Swanson, Eric T (2012). Risk Aversion and the Labour Margin in Dynamic Equilibrium Models. *American Economic Review*, 102(4):1663–91.

Tertytchnaya, Katerina and De Vries, Catherine E (2018). The Political Consequences of Self-Insurance: Evidence from Central-Eastern Europe, the Caucasus and Central Asia. *Political Behavior*, 41:1–24.

Tilley, James and Hobolt, Sara B (2011). Is the Government to Blame? An Experimental Test of How Partisanship Shapes Perceptions of Performance and Responsibility. *Journal of Politics*, 73(2):316–330.

Ward, Jesmyn (2011). *Salvage the Bones: A Novel*. Bloomsbury Publishing USA.

Weatherford, CL and Gray, WM (1988). Typhoon Structure as Revealed by Aircraft Reconnaissance. II: Structural variability. *Monthly Weather Review*, 116(5):1044–1056.

Webb, Glenn (2014). Precinct Size Matters-The Large Precinct Bias in US Presidential Elections. `https://arxiv.org/abs/1410.8868`.

Weber, Martin, Weber, Elke U, and Nosić, Alen (2012). Who Takes Risks When and Why: Determinants of Changes in Investor Risk Taking. *Review of Finance*, 17(3):847–883.

Wilde, Joshua, Apouey, Bénédicte H, and Jung, Toni (2017). The Effect of Ambient Temperature Shocks during Conception and Early Pregnancy on Later Life Outcomes. *European Economic Review*, 97:87–107.

Wolfers, Justin (2002). Are Voters Rational?: Evidence From Gubernatorial Elections. `https://ssrn.com/abstract=305740`.

Wronski, Julie, Bankert, Alexa, Amira, Karyn, Johnson, April A, and Levitan, Lindsey C (2018). A Tale of Two Democrats: How Authoritarianism Divides the Democratic Party. *Journal of Politics*, 80(4):1384–1388.

Zanetti, Francesco (2014). Housing and Relative Risk Aversion. *Economics Letters*, 123(1):23–25.

IV

Mind the Gap: Why Wealthy Voters Support Brexit

with Jane Green

Many choices in mass political behaviour concern trade-offs between the benefits a choice may bring and its potential risks. We would be mistaken to think that elections are decided by people for whom preferences, costs, benefits and risks all positively align. This is especially true in high-stakes elections, such as those that usher in major changes to the status quo.

What explains why some people vote for risky propositions that are otherwise consistent with their preferences, and others do not do so? We argue that personal wealth is the basis under which people make such decisions. Wealth provides insurance to cushion against potential economic risks arising from a change to the status quo (Ehrlich and Becker, 1972; Ansell, 2014; Tertytchnaya and De Vries, 2019), and higher levels of wealth may decrease risk aversion (Zanetti, 2014; Pahontu, 2020). Simply, less wealthy voters are less able to 'afford' to vote in ways that are consistent with their preferences, whereas wealthier voters are more able to support a risky decision, due to their lower risk aversion through self-insurance.

We illustrate this mechanism in the context of Britain's vote to leave the European Union; or Brexit. This high-stakes vote ushered in economic uncertainties and risks for the promise of benefits in sovereignty, immigration controls, and trading opportunities

outside the EU. In other high-stakes referendums on EU membership, when the choice was posed between drastic economic costs and the EU, voters had opted for the latter (Hobolt, 2009). In the case of Brexit, voters took the dramatic decision to change the status quo. The Leave campaign argued that the risks of staying in the European Union were greater, and sought to minimise the risks of leaving (Atikcan et al., 2020). Remain voters foresaw substantial economic damage, while Leavers foresaw a weaker short-term economy.[1] A majority of older Leave voters stated that significant economic damage was worth the benefits of Brexit.[2] Overall, Remain and Leave voters differed most substantially in the degree to which they thought the economic risks were a price worth paying.[3]

Despite the importance of risk to the Brexit vote, existing explanations have almost exclusively focused on its benefits, particularly to low income, older and less educated voters. This has been explained through a combination of cultural concerns relating to immigration, sovereignty, anti-elite sentiment and nationhood (Hobolt, 2016; Clarke et al., 2017; Evans and Menon, 2017; Norris and Inglehart, 2019; Iakhnis et al., 2018), or economic concerns arising from austerity (Fetzer, 2019), import shocks (Colantone and Stanig, 2018), long-term local economic decline (Carreras et al., 2019), inequalities (Clarke et al., 2017) and the economic gains of out-groups (Green et al., 2020). This approach draws heavily on studies of populism, and highlights the source of people's preferences. However, it does not explain why some Leave voters were more likely to be risk-taking in respect to Brexit (Steenbergen and Siczek, 2017), why some people voted with their preferences despite substantial expected economic risks, and why others

[1]"Perhaps It'll All be OK in the End? The Contrast in Perceptions of the Short-Term and Long-Term Economic Consequences of Brexit", *What UK Thinks*, John Curtice, 16 October 2018

[2]Brexit: Majority of older Leave voters say significant economic damage is 'price worth paying', *The Independent*, Rob Merrick, 1 August 2017

[3]The 'extremists' on Both Sides of the Brexit Debate, *YouGov Politics and Current Affairs*, Matthew Smith, 01 August 2017; Leave voters less likely to see worst case Brexit scenario as 'bad', *YouGov Politics and Current Affairs*, Matthew Smith, 11 January 2019;

voted against.

We demonstrate how, across the income distribution, variation in personal wealth enabled wealthier individuals to vote with their Brexit preferences, and less wealthy individuals to vote against them. That is to say, lower income voters were more likely to support Brexit, but less likely to do so if they were also less wealthy. Conversely, higher income voters were less likely to support Brexit, but more likely to do so if they had greater personal wealth. The effects of income and wealth are additive, working in opposite directions. This is different to aggregate-level patterns, which identify a geographic relationship between wealth and higher Remain support (Ansell, 2019; Adler and Ansell, 2020). We identify a positive association between wealth and Brexit support at the individual level which exists within low and high wealth areas, and the strongest evidence for this is among wealthy individuals in richer areas. These are novel empirical findings in the case of Brexit. Furthermore, by considering not just the benefits, but also the potential costs of voting for a change in the status quo, we are able to theorize the underlying effect of wealth and risk aversion in this case.

Brexit is by no means unique as an example of high-stakes political decisions where benefits need to be offset by risks (Atikcan, 2015), and where this trade-off may take place across the income distribution. Consider the question of independence for Quebec, Catalonia, Scotland, the experience of secession of former Soviet republics, some countries' decisions to fundamentally alter their economies by uniting, such as East and West Germany, or even decisions to join the European Union's economic area and monetary union (Hierro and Queralt, 2020; Abadie et al., 2015; Hobolt, 2009). Status quo votes are more likely to be irreversible (at least in the short term), they denote significant political, economic and constitutional changes, and – by definition - they lack local or recent precedent, and thus usher in considerable uncertainty. We argue that these are also instances where the status quo may be especially unpopular among

certain groups, such as lower income individuals, but where privately insured, wealthy individuals are cushioned against economic risks.[4]

Using individual-level measures of wealth and income, we corroborate the hypothesized additive yet opposite effects of income and wealth on vote choice. We replicate this finding across a large election study using new wealth measures, an independent wealth panel study and also in a survey experiment, which allows us to causally identify the effect of wealth on Brexit support. In the same way, we validate our proposed mechanism, which complements existing work on the role of wealth in insuring individuals against economic risks and its effect on lowering risk aversion. These findings advance our understanding of the importance of private insurance, of votes for changes to the status quo, and provide a deeper understanding of the specific case of Brexit.

IV.1 The Costs and Benefits of Brexit

The Brexit referendum, which took place in Britain on 23rd June 2016, has almost exclusively been studied from the vantage point of the populism literature. Consequently, the Brexit vote is seen as a response to cultural, economic and political grievances, which typify the campaigns of populists (Ivarsflaten, 2008). Seen this way, voters responded to the question of EU membership through a combination of cultural, economic and political benefits of EU independence, or the costs of exiting the EU (Hobolt, 2016; Clarke et al., 2017; Evans and Menon, 2017; Iakhnis et al., 2018; Green et al., 2020). The Brexit referendum divided voters broadly by age, education level and income, with older, lower educated and lower income voters being more supportive, on average, of Leave. Given demographic distributions, this resulted in a geographic 'bifurcation' between the more cosmopolitan, liberal, urban areas of the country that

[4]Largely, populism and status quo changes are likely to go hand in hand, even if not all status quo campaigns need to be populist.

were also more prosperous, and the more inward-looking and less prosperous areas that held more negative views about immigration (Jennings and Stoker, 2017).

Advancing cultural explanations of Brexit, researchers emphasize the role of immigration, racial attitudes and liberal-conservative values, a 'cultural backlash' against the long-term ascendance of minorities through globalisation (Norris and Inglehart, 2019) and free movement of people within the EU (Goodwin and Milazzo, 2017; Evans and Menon, 2017). These concerns map closely onto British and English national sentiment, as well as preferences for political sovereignty and a tendency to hold more negative views towards elites (Iakhnis et al., 2018). In fact, Evans and Mellon (2019) (see also Fieldhouse et al. (2019)) demonstrate how immigration attitudes became more closely tied to preferences about European integration in the decade prior to the referendum, particularly after EU expansion in 2004. The long-term scepticism of the British public towards the European Union had its roots in decades of negative discourse about the EU, a hostile print media, concerns that Britain was a net contributor in EU payments, and a history of calls for British exceptionalism (Goodwin et al., 2018; Clarke et al., 2017; Evans et al., 2018). This 'second dimension' issue of European integration had long been cross-cutting in British politics, separating voters across the left-right economic dimension (Green, 2007).

These second dimension concerns appear more important in understanding individual-level motivations of Brexit (Green et al., 2020), while economic concerns are better evidenced at aggregate-levels of measurement. For example, Fetzer (2019) (see also Fetzer et al. (2018)) identifies the role of long-term welfare cuts ('austerity') and economic hardship on Brexit support. Other researchers emphasizing first dimension underpinnings of the Brexit vote combine economic and immigration concerns. Colantone and Stanig (2018) highlight the link between economic globalisation and competition, Eastern European immigration and support for Brexit. Carreras et al. (2019) chart the

transmission of experiences of long-term economic decline on immigration concerns, and in turn Brexit, and Green et al. (2020) find higher Brexit support among individuals who perceived ethnic minorities to be doing better economically. This builds on wider insights into the influence of perceived economic competition on attitudes towards immigration (Pardos-Prado and Xena, 2019), the confluence of perceptions of fairness and the allocation of resources between white rural areas and more diverse urban areas (Cramer, 2016), and the role of long-term economic change (particularly in the status of white working class occupations) that are argued to precede grievances due to social status threat (Olson, 2008; Mutz, 2018), and nostalgia (Gest, 2016; Gest et al., 2018; Gidron and Hall, 2017).

With respect to the first dimension, there is a strong correspondence between the role of economic grievances and concerns about immigration. Thus, support for Brexit – and for populism more widely – is expected to run along the second dimension of political preferences, but to be significantly accentuated for those for whom economic competition and grievances are more acute. These explanations chime closely to the wider explanations of support for Donald Trump in the 2016 US presidential election (Bobo, 2017; Schaffner et al., 2018; Mutz, 2018; Norris and Inglehart, 2019), and to support for populist parties and candidates more broadly (Mudde, 2010; Ford and Goodwin, 2014; Van Hauwaert and Van Kessel, 2018; Autor et al., 2019).

IV.2 The Brexit Risk

IV.2.1 A Vote Against The Status Quo

It is striking that the populism literature focuses on the benefits of a vote against the status quo, accentuated as it is for low income, but it does not tend to focus on the associated risks (Steenbergen and Siczek, 2017). This is an especially large gap

in the case of Brexit, an outcome which was assumed to fall in favour of the status quo due to voters' tendency to prefer the safer option – a status quo bias (Samuelson and Zeckhauser, 1988; Masatlioglu and Ok, 2005; Atikcan et al., 2020). This had been the experience of other referendums where the anti-EU vote was presented as entailing costly economic consequences (Hobolt, 2016; Dhingra et al., 2017; Breinlich et al., 2017; Born et al., 2019), and would be consistent with the expectations of loss aversion in the case of Brexit. Tversky and Kahneman (1991) argue that individuals prefer to avoid losses than choose possible gains, thereby favouring the status quo. Bias towards the status quo arises when there is uncertainty about the distribution of costs and benefits that may arise from reform (Fernandez and Rodrik, 1991). Brexit was an example of populism, but it was also a change from the status quo, thus extending the 'status quo disruption' implications of a vote for a populist party or candidate.

Remain voters were more likely to expect that Brexit would lead to negative economic consequences (Clarke et al., 2017; Hobolt, 2016), and to be persuaded by the economic risks associated with a status quo change (Atikcan et al., 2020). This rhetoric was voiced assiduously by Remain campaigners, business leaders, and economists, so much so that the Remain campaign was dubbed 'Project Fear'. Rather than focusing on the benefits of EU membership, the Remain campaign focused on the economic risks, job losses, the impact on businesses and people's finances if the UK left its largest trading area. The UK Treasury calculated that each household would be £4,300 worse off because of Brexit. So why was the safer option of the status quo not chosen by a greater number of otherwise leave-prone voters, particularly those likely to be severely affected by the status quo change?

One answer lies in the inability of the 'elite' to convince anti-elite voters of a forthcoming likely recession and the wider economic risks of leaving the European Union (Iakhnis et al., 2018). Another possibility is that the Leave campaign successfully 'de-

risked' the vote to leave the European Union, highlighting instead the risks of closer EU integration and the benefits of UK independence (Atikcan et al., 2020). This was undoubtedly the case to some extent. However, as we highlighted earlier, voters on both sides of the debate – Leave and Remain – perceived economic risks associated with Brexit, especially in the short term, but differed in whether they thought those risks were worth taking. In short, Leave voters were more likely to be risk-taking than Remain voters (Steenbergen and Siczek, 2017). To clarify the underlying mechanism, we argue that voters differed in their insurance against the risks associated with leaving the EU, and in their subsequent ability to vote according to their underlying preferences on Brexit.

IV.2.2 Wealth as Insurance

Self-insurance – provided by personal wealth – allows individuals to smooth consumption, compensate for income loss in the event of an economic shock, and acts as a private safety-net in the event of economic uncertainty (Ehrlich and Becker, 1972; Conley and Gifford, 2006; Ansell, 2014; Tertytchnaya and De Vries, 2019; Pahontu, 2020).[5] As wealth is only weakly correlated with income, self-insurance varies substantially across low income and high income households (Ansell, 2019). This leads to more risk-taking behaviour among wealthier individuals, evidenced in the role of wealth in reducing risk-aversion (Guiso and Paiella, 2008; Zanetti, 2014; Paravisini et al., 2017; Malmendier and Nagel, 2011).

In the case of Brexit – and indeed other instances where a vote against the status quo

[5]More broadly, personal wealth has been shown to relate to support for the incumbent (Larsen et al., 2019), demand for redistribution (Sands and de Kadt, 2019) and democratic survival (Scheve and Stasavage, 2012, 2017). On the other hand, locally clustered immigrant access to the housing market is demonstrated to increase support for populist parties (Cavaille and Ferwerda, 2017; Dancygier, 2010). Similarly, homeowners in areas suffering from import competition are less supportive of trade openness (Scheve and Stasavage, 2001).

carries an economic risk – we propose that wealth makes the difference between voting for or against one's underlying preferences, if those preferences involved undertaking economic risks. Voters are generally inattentive to macroeconomic conditions (Eggers and Fouirnaies, 2014), but in the case of Brexit, they acknowledged that the economic consequences would be substantial. As such, private insurance should be a proximate consideration in Brexit support, as wealthier individuals were cushioned against a short-term economic shock. Given income's role in forming Brexit preferences, many low income voters may have wanted to vote for Brexit due to a combination of cultural and economic concerns, but only those with some insurance – in the form of wealth – were likely to align their vote with those preferences. While higher income voters might have had a weaker overall preference for Brexit, those insured by their wealth should have been more likely to vote for Brexit than those lacking that insurance.

Our expectation, in the context of the UK and Brexit, is that property wealth should be a more reliable form of insurance than financial wealth. While standard economic theory expects individuals to smooth consumption and savings over their lifetime (Browning and Crossley, 2001), in practice most individuals accumulate minimal savings. Property wealth is, in the UK context, significantly higher than financial wealth (Banks et al., 2002; Crawford et al., 2016), and this, at least in part, is due to a series of government-induced incentives to take up home ownership (Lewis-Beck et al., 2013). The mean (median) property wealth is £85,000 (£50,000), in contrast to £28,000 (£4,000) in savings (Crawford et al., 2016), and the appreciation of house prices has been far higher, over a longer period, than the interest rates on savings or the returns on the British stock market. This is especially important if we think about the self-insurance for the household and the family, rather than only for an individual. Widely publicised economic estimates by the Treasury warned that GDP would be 6.2% lower, families would be, on average, £4,300 worse off, and that tax receipts would "face a £36

billion black hole". House prices had no mention in the Treasury's widely publicised impact assessment.

In summary, we expect the impact of income and wealth on Brexit support to work in additive yet opposite directions in informing support for Leave or Remain. Furthermore, our expectation is that property wealth is an especially important predictor, in comparison to financial wealth. We expect higher wealth to lead to lower risk-aversion, supporting the existing literature, and for wealth to increase the perception among individuals that they are relatively more insured against the economic impacts of Brexit. Wealth should make the difference in Brexit support for people who are offsetting the benefits against the risk of potential costs, and who have some underlying preference for greater independence from the European Union. Therefore, we expect wealth to act in an interactive relationship to a person's underlying Brexit preferences.

IV.3 Data and Methods

We test our expectations with observational data from the internet panel of the British Election Study (BES) for 2016 and 2018, the Bank of England's 2016-2018 panel survey of income and expenditure, and we also rely on a survey experiment administered as part of the BES by YouGov in 2019.[6] As it is difficult to measure economic vulnerability, most studies rely on household income to proxy wealth. However, although income is likely to correlate with wealth, it does so weakly (Ansell, 2019). We therefore make an effort to better approximate an individual's economic circumstances and their insurance leverage by relying on respondents' reported financial and property wealth and by adjusting all these measures for household size.

Relying on BES data is advantageous because, to our knowledge, it is the first

[6]See Fieldhouse et al. (2018) for further information about BES Wave 14 and Anderson et al. (2016) about the Bank of England survey.

electoral survey that measures wealth, giving us the opportunity to explore political behaviours alongside wealth measured at the individual level. These wealth measures are available in 2018 (wave 14). Crucially, the BES panel also gives us the opportunity to tap into respondents' preferences *prior* the 2016 EU Referendum, by linking individuals' current wealth responses with their earlier wave responses on Brexit. However, the data falls short on two important aspects. First, BES respondents may not be fully truthful in reporting their income and wealth, since respondents are more cooperative if a survey is carried out under the aegis of the government (Moore and Welniak, 2000). Second, the data only provides a snap-shot into citizens' wealth in 2018, and is therefore limited in making broader claims about wealth accumulation and potential changes in political support. The Bank of England (BoE) data provides us with a way to tackle these two shortcomings. It is not only run by the country's central bank, but it includes three waves of wealth measurement and Brexit support asked among the same respondents, covering the period 2016-2018.

Relying on both of these datasets further allows us to distinguish and account for respondents' *intention* and their current *support* for Brexit. The dependent variable in the BES asks respondents their prospective vote intention "If there was a referendum on Britain's membership of the European Union, how do you think you would vote?". This divides respondents into two groups: leavers and remainers. Bank of England respondents are asked "Taking everything into account, how do you [currently - as of 2016/2017/2018] view the UK voting to leave the EU (European Union) in the recent referendum – which has become known as 'Brexit'?" Possible responses vary from "very positive" to "very negative". These attitudes are then mapped onto a binary Leave/Remain support scale. The combination of these outcome variables allows us to address concerns that the BES question combines the possibility of a second referendum with vote intention, when some respondents would be opposed to a second referendum.

Our main explanatory variable, wealth, is defined similarly in the two datasets. To define financial wealth, we rely on individuals' reported savings and debt accumulations, and we adjust this measure for the number of household members. Property wealth is defined as the respondent's home value, adjusted for the number of household members, and as null if she does not own a house. We document these measurements in Table IV.1.

We validate the BES and BoE wealth measures against official statistics in Section IV.A, and document remarkable similarity between the central tendencies reported in the two surveys and those reported among the UK population. We further explore in Appendix IV.B the distribution of wealth in the BES and BoE samples and find few discrepancies between the two surveys. We report in Figure IV.A.1 the relationship between an individual's vote intention in the EU referendum and her likelihood of not reporting various items pertaining to her economic circumstances. Largely, leaver status does not appear to be correlated with the likelihood of reporting these items.[7] Finally, we document in Section IV.C the geographical distribution of wealth (at LSOA level) and its distribution across several individual characteristics. As Figure IV.C.1 shows, property wealth is not confined to the capital, and displays greater variance across the country. Additionally, Figures IV.C.3 and IV.C.4 provide supportive evidence that wealth is not confined to the economically active, but rather it is positively correlated with age, education. Further suggestive of the idea that there is no predefined beneficiary of Brexit, we report in Figure IV.C.2 the fact that there are no differences in personal wealth across Remain or Leave voters.

Based on these measures, we model the relationship between an individual's wealth and her support for Brexit in the BES sample as follows:

[7]Leavers appear less likely to report their saving amount and home value in the BES sample, and their home value in the BoE sample. In order to address this, we report the robustness of our results in Table IV.D.1 when also including those who answer 'do not know' in the regression.

TABLE IV.1: WEALTH ITEMS

Wealth Type	Question Text
	BES
Financial	
Debt	Do you and/or your partner (as applicable) have any debts, not including mortgage/student loans? If 'yes': Please pick the approximate value of your household debt.
Savings	Total amount of deposits and savings (continuous measure) If 'yes': Please pick the approximate value of your household savings.
Property	
Home Owner	Which of these applies to your home? [Owner, Owner with mortgage, Rent, Housing Association] If 'owner': Please pick the approximate value of your home.
	BoE
Financial	
Debt	Unsecured debt (continuous measure)
Savings	Total amount of deposits and savings (continuous measure)
Property	
Home Owner	Housing tenure [Owner, Owner with mortgage, Rent, Housing Association] If 'owner': House value (continuous measure)

$$\text{Leave} = \alpha + \beta_1 \text{Income} + \beta_2 \text{Financial Wealth} + \beta_3 \text{Property Wealth} + \beta_4 \mathbf{X} + \epsilon \quad \text{(IV.1)}$$

where *income* represents, in turn, household unadjusted, adjusted and disposable income,[8] and $\mathbf{X}$ is a vector of covariates that includes respondents' age, gender, education, working and marital status, authoritarian values and respondent location based on the ONS Super Area Groupings.

Estimates from equation IV.1 may, however, be biased to the extent that there are systematic differences in wealthy voters' unobserved characteristics that are correlated

[8]We define *unadjusted income*, the reported household income without accounting for the number of household members relying on that income. Following Hagenaars et al. (1994), we define *household adjusted income* using the OECD-modified scale. The procedure assigns weights to each member of the household, as follows: 1 to the head of the household, 0.5 to each additional adult member (older than 18 years old) and 0.3 to each member below this age. Finally, we define *household adjusted disposable income*, a respondents' household remaining income following outgoings such as mortgage or rent payments, adjusted for the number of household members.

with higher support for Leave. We address this concern, first, by modelling unobserved, time-invariant individual level heterogeneity in the BoE panel dataset. We are able to estimate the Leave support for each individual i at time t as follows:

$$\text{Leave}_{it} = \gamma_1 \text{Income}_{it} + \gamma_2 \text{Financial Wealth}_{it} + \gamma_3 \text{Property Wealth}_{it} + \gamma_4 \mathbf{X}_{it} + \xi_i + \lambda_t + \upsilon_{it} \tag{IV.2}$$

where, in addition to equation IV.1, we account for individual ξ_i and time λ_t specific effects.

The key identification assumption in equation IV.2 that allows the interpretation of wealth as a causal effect is that there is no time-varying heterogeneity between those getting wealthier and those getting poorer. However, even after accounting for time-invariant unobserved individual level heterogeneity, wealthier respondents could still differ systematically from less wealthy voters in ways that do vary over time. We address these concerns by turning to a survey experiment that provides a hypothetical wealth treatment. Furthermore, we use this experimental approach to test the mechanism that the same wealth win decreases risk aversion. The experiment was fielded in BES Wave 19 in the post-election survey in December 2019 and was administered by YouGov.

The experiment comprised four experimental groups: a control group who were only asked their Brexit preference, a treatment group who received a hypothetical wealth win and asked their Brexit preference (the Brexit Support Treatment), a control group who were only asked their risk aversion, and a treatment group who received a hypothetical wealth win and then asked their risk aversion (the Willingness to Take Risk Treatment). The protocol is described in Table IV.2. To measure risk-aversion we rely on a two-question battery of questions proposed by Barsky et al. (1997) aimed at capturing financial risk taking. Similar questions have since been used in the Cooperative Congressional Election Study and the 1996 Panel Study of Income Dynamics and been validated in various contexts (Eckles et al., 2014; Hryshko et al., 2011; Pahontu, 2020).

Table IV.2: Experimental Conditions

Group	Treatment Text
	Brexit Support
Treatment	Imagine you took part in a lottery and you are now the lucky winner of a £1 million house!
Treatment & Control	How satisfied or dissatisfied are you that the UK voted to leave the EU?
	Willingness To Take Risks
Treatment	Imagine you took part in a lottery and you are now the lucky winner of a £1 million house!
Treatment & Control	Suppose you are the only income earner in the family, and you have a good job guaranteed to give you income every year for life. You are given the opportunity to take a new and equally good job, with a 50-50 chance it will double your income and a 50-50 chance that it will cut your income by a third. Would you take the new job? If 'yes': Suppose the chances were 50-50 that it would double your income, and 50-50 that it would cut it in half. Would you still take the new job? If 'no': Suppose the chances were 50-50 that it would double your income and 50-50 that it would cut it by 20 percent. Would you then take the new job?

In total, around 15,000 people were part of the experiment, about half of them receiving the Brexit Support Treatment and the other half receiving the Willingness to Take Risk Treatment. Figure IV.D.1 gives us confidence that randomization was successful across all relevant observables.

In brief, our research design, relying both on observational and experimental data, allows us to not only validate the results across three separate datasets, but also increases confidence in the validity and magnitude of the causal estimate of wealth on Brexit support. While studies on Brexit rely almost exclusively on cross-sectional comparisons, leaving thus room for endogeneity concerns, we are the first to identify, at the individual level, the causal estimate of wealth on Brexit support. We do so by, on the one hand, exploiting the time dimension in the Bank of England data and on the other hand relying on a random variation in hypothetical wealth. Additionally, we offer a novel test of the individual level mechanisms, both in the observational and experimental data.

IV.4 Results

Starting with cross-sectional estimates in the BES sample, Table IV.3 reveals the importance of accounting for respondents' wealth in understanding their support for Brexit. As expected, income is negatively associated with the intention to vote Leave, although its magnitude diminishes once we account for the number of household members enjoying that level of income and especially when we account for monthly outgoings such as mortgage or rent payments. Because respondents may experience financial shortages once accounting for outgoing payments or debts, the income and wealth measures are standardized to mean 0 and one standard deviation. As models (1)-(3) show, a standard deviation increase in income is likely to decrease Leave support by 1 to 2 percentage points.

TABLE IV.3: LEAVE VOTE, INCOME AND WEALTH (BES SAMPLE)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Unadj Income	-0.022***			-0.027***			
	(0.006)			(0.006)			
HH Adj Income		-0.014**			-0.017***		
		(0.006)			(0.006)		
HH Adj Disposable Income			-0.010*			-0.014**	-0.015**
			(0.005)			(0.006)	(0.006)
HH Adj Financial Wealth				-0.005	-0.005	-0.004	
				(0.005)	(0.006)	(0.006)	
HH Adj Property Wealth				0.015***	0.013**	0.013**	
				(0.006)	(0.006)	(0.006)	
HH Adj Total Wealth							0.011*
							(0.006)
Observations	7,627	7,627	7,627	7,627	7,627	7,627	7,627
R-squared	0.245	0.244	0.244	0.245	0.244	0.244	0.244

NOTE: Dependent variable, leave vote intention, is binary (1=Leave). All models include controls for gender, age, education, marital status, employment status, authoritarian values and respondent's location based on the ONS Super Area Group classification. Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1

Looking now at the wealth measures, financial wealth does not seem to account for Remain or Leave support, whereas a standard deviation increase in property wealth increases Leave support by 1.3-1.5 percentage points. Finally, model (7) confirms that

TABLE IV.4: LEAVER STATUS, INCOME AND WEALTH (BOE SAMPLE)

	(1)	(2)	(3)
Unadj Income	0.010		
	(0.023)		
HH Adj Income		-0.001	
		(0.018)	
Hh Adj Disposable Income			0.006
			(0.019)
HH Adj Financial Wealth	0.038**	0.038**	0.038**
	(0.016)	(0.016)	(0.016)
HH Adj Property Wealth	0.064**	0.064**	0.062**
	(0.029)	(0.030)	(0.029)
Individual FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	1,889	1,889	1,889
R-squared	0.046	0.046	0.046
Number of id	877	877	877

NOTE: Dependent variable is binary (1=Leaver). All models include controls for age, age squared, education, employment status, and respondent's location. Clustered robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

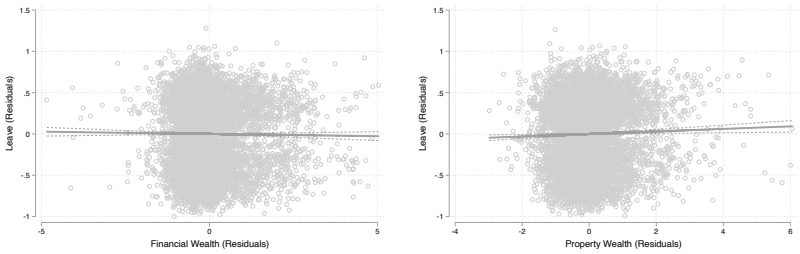
modelling total wealth conceals greater variation in the type of wealth, in particular all its effect is driven by property wealth. This was largely expected because, as our foregoing discussion showed, property wealth is significantly higher than financial wealth (at least in the UK context). Overall, the effects are sizeable, especially considering that the 2016 referendum outcome was so close, tilted in favour of Leave by less than a 4% difference.

The results so far represent a snap-snot into respondents' wealth and Leave support. We therefore proceed by exploring change in wealth and related preferences over time. This allows us to account for all time-invariant unobserved individual level characteristics, such as Britishness, xenophobia, education. Table IV.4 reports quite significant effects of wealth on Leave support, accounting for such individual specific, unobserved, characteristics. A standard deviation increase in property wealth increases Leave support by as much as 6.4 percentage points. Contrary to the cross-sectional results in Table IV.3, a standard deviation change in financial wealth also increases Leave sup-

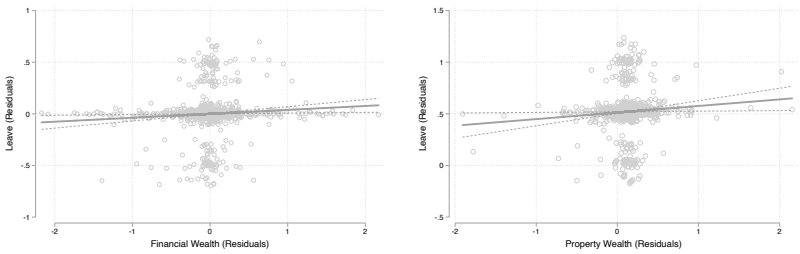
port, though its effect is half that of property wealth. This is in line with expectations pertaining to the higher absolute value of property rather than financial wealth.

FIGURE IV.1: RESIDUALS WEALTH ON PROBABILITY TO SUPPORT LEAVE

(A) BES SAMPLE



(B) BOE SAMPLE



What remains unclear is whether escaping debts or increasing one's savings accumulation accounts for this effect. Figure IV.1 clarifies that, if anything, Leave support is driven mostly by the top of the wealth distribution, in particular property wealth, but to some extent large saving accumulations as well.

TABLE IV.5: WEALTH INCREASES BREXIT SUPPORT (SURVEY EXPERIMENT)

	(1)	(2)
Hypothetical £1 Million House Win	0.245**	0.191**
	(0.098)	(0.092)
Control Mean	6.238	6.238
Controls	No	Yes
Observations	7,225	7,225
R-squared	0.001	0.105

NOTE: Outcome is a Brexit satisfaction scale (10= satisfied). Controls include gender, age, education, employment status. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The complementing BoE and BES results have so far accounted for the effect of

levels and changes in wealth on Brexit support. However, time variant unobserved characteristics may still bias the individual fixed effects estimation. To address this concern, we report in Table IV.5 the treatment effect of a hypothetical £1 million home win on the respondent's satisfaction with the UK's vote to leave the EU, as noted in Table IV.2. Consistent with the observational data, we find that property wealth increases satisfaction with Brexit by .2 to .25 on the scale, equivalent to a 4% increase compared to the control.

IV.5 Mechanisms

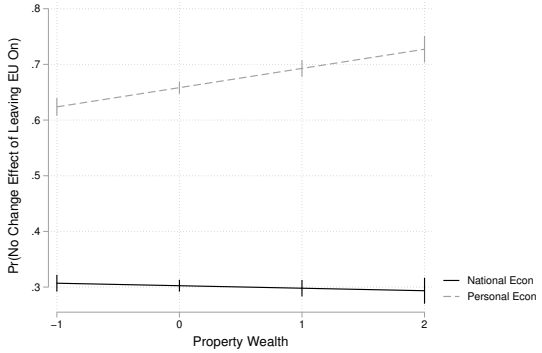
The property wealth effect could be due to a couple of factors that relate to wealthy respondents' expectations of the economic impact of Brexit. Figure IV.2 explores how evaluations of national and personal economic situation vary by property wealth in predicting 'no change' in economic circumstances. Consistent with the theorized insurance mechanism, wealthier respondents are more likely to think that Brexit will bring no change to their own economic circumstances, but that is not true about their beliefs for the national outcomes, which is denoted by a flat line across the wealth distribution.

An alternative narrative could suggest that wealthier voters expect their properties to appreciate in value following Britain's exit from the European Union. We entertain this possibility in Figure IV.D.2 across the property wealth distribution but we do not find supportive evidence of this mechanism.

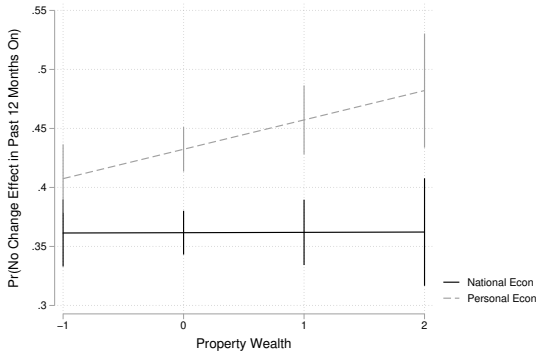
The observational evidence is consistent with the proposed insurance based mechanism that wealthier respondents enjoy in their support for Brexit. However, wealthier respondents could still differ systematically from less wealthy voters in ways that would make us concerned about the validity of these effects. In a similar vein to Pahontu (2020), we test whether the insurance provided by respondents' wealth reduces their

FIGURE IV.2: EXPECTATIONS OF BREXIT EFFECT ON NATIONAL VS PERSONAL FINANCES

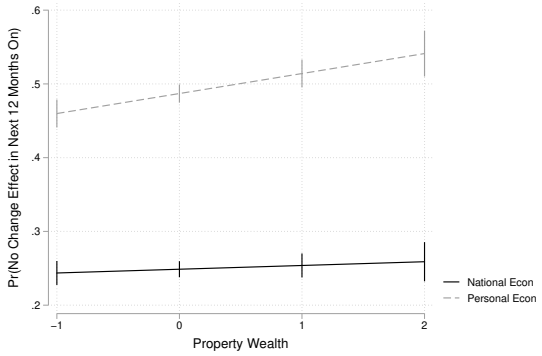
(A) EXPECTATIONS OF BREXIT (BES)



(B) RETROSPECTIVE EVALUATIONS (BOE PRE-REFERENDUM)



(C) PROSPECTIVE EXPECTATIONS (POST-REFERENDUM)



NOTE: In BES, dependent variable is binary and takes the value 1 if the respondent believes leaving the EU will have no effect on her national or personal circumstances. In BoE, dependent variable on retrospective evaluations is binary and takes the value 1 if the respondent believes in 2015 that over the past 12 months (i.e. during 2014) there was no change in national or personal economic circumstances. Dependent variable on prospective expectations is binary and takes the value 1 if the respondent believes that the next 12 months will have no effect on national or her personal circumstances. Prospective evaluations are available for 2016-2018 and results are pooled across all respondents. Property wealth is denoted by the respondents' home value, standardized to mean 0 and standard deviation 1.

risk aversion, thereby allowing those with underlying preferences to support a status quo change. Looking at the results in Table IV.6, we notice a substantial and significant increase in risk taking among the treated, equivalent to about a 4.7 % increase in risk taking behaviour. This is a very similar effect magnitude as in the case of Brexit support from Table IV.5.

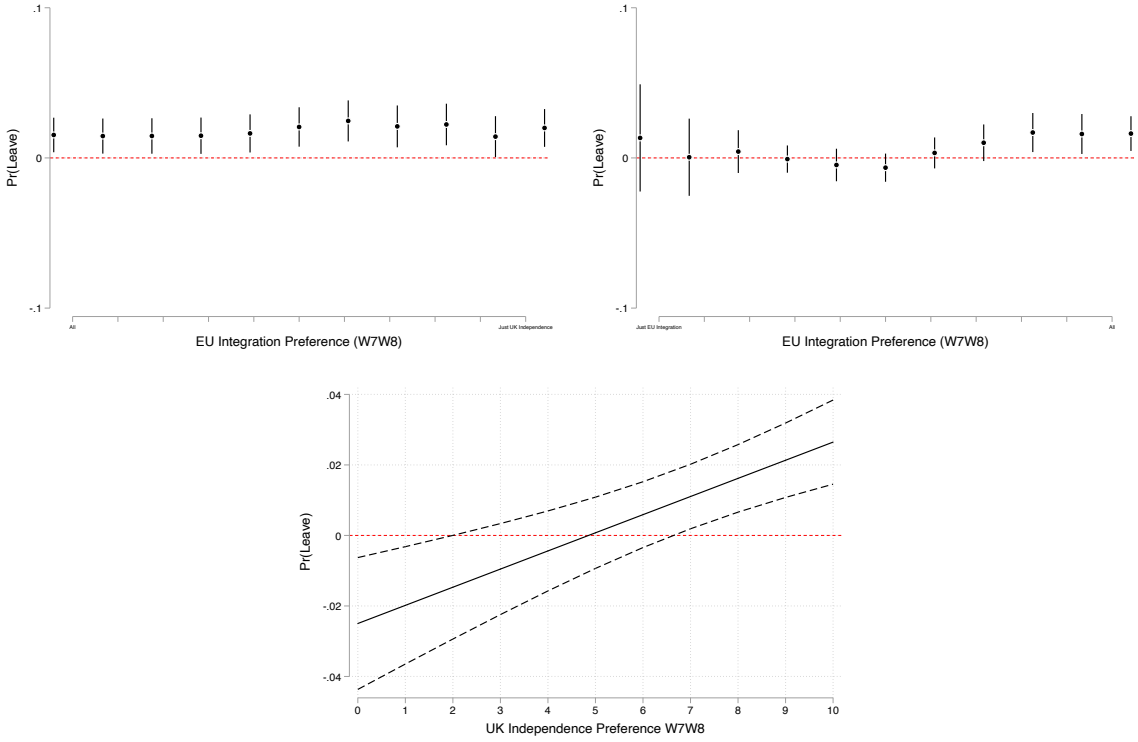
Table IV.6: Effect of Wealth Treatment on Risk Aversion

	(1)	(2)
Hypothetical £1 Million House Win	-0.117***	-0.110***
	(0.025)	(0.024)
Control Mean	2.332	2.332
Controls	No	Yes
Observations	7,704	7,704
R-squared	0.003	0.044

Note: Dependent variable, risk aversion, varies from 0 to 3 (3=risk averse). Controls include gender, age, education, employment status. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Taken together, the observational and experimental evidence increases our confidence that the mechanism linking wealth to Brexit support works through insurance and risk aversion. Although risk tolerance could make one more likely to support a status quo change, it remains unclear why it would necessarily favour Brexit. We shed light on this by exploring whether, as we theorized, the affordability of a Brexit vote in the referendum is most relevant to those who had some underlying preferences for the UK's independence from the EU. Due to its panel component, the BES dataset allows us to explore this path. In the waves just prior to the referendum itself (Wave 7 and 8), respondents were asked how favourable they were towards further integration of the UK with the EU, with a preference intensity varying from 0 ("unite fully with the EU") to 10 ("protect our independence from the EU"). Although we do not have information on respondents' wealth in these waves, we are able to condition our main effects from Table IV.3 and explore interactive effects between those who favoured the UK's independence from the EU and their wealth and Brexit vote in Figure IV.3. The three

FIGURE IV.3: MAIN EFFECTS BY PRIOR EU INTEGRATION PREFERENCES



NOTE: Estimations are based on a similar specification as model (4) from Table IV.3.

panels explore in different ways how prior preferences may condition respondents' vote. In the top panel, moving from left to right, the sample progressively *excludes* those with strongest UK integration preferences, whereas the middle panel does the opposite and starts from a sample of the most favourable toward EU integration toward a full sample. The bottom panel clarifies that as more respondents who are more favourable towards UK independence are included in the sample, the greater the effect of property wealth on increasing support for Brexit.

IV.6 Robustness

Our results are different to aggregate-level patterns, which identify the geographic relationship between wealth and higher Remain support (Ansell, 2019; Adler and Ansell,

2020), consistent with cultural and economic accounts of Brexit preferences. We explore in what follows the extent to which aggregate level results may be unable to detect greater individual level variation in wealth. We are able to exploit BES data linkage to contextual data on median home prices at the Lower Super Output Areas (LSOA) level. We identify respondents who live in low priced LSOA areas (below average of the median home prices) versus in a high priced LSOA area. The bottom panel of Figure IV.E.1 plots a similar result to that of the existing literature, showing that individuals living in wealthier areas are more supportive of Remain. However, when we explore the individual wealth effect, as in the top panel, we find a positive association between property wealth and Leave support. We therefore explore heterogeneity in individual wealth by low and high priced LSOA areas in Figure IV.E.2. We find that our individual wealth effect is replicated across both areas, but the strongest evidence for the positive individual-level effect of wealth on Brexit vote choice is among wealthy individuals in rich areas – i.e. those truly wealthy. We contribute to the literature by providing evidence that, despite local conditions, personal wealth does inform Brexit support. Results in brief suggest that higher sociotropic wealth is associated with higher Remain support, but individual-level wealth is associated with higher Leave support; especially in those areas where wealth tends to be highest.

IV.7 Conclusion

It is well-known that personal wealth provides self-insurance against economic risk, cushioning individuals from possible income shocks and other economic uncertainties (Ehrlich and Becker, 1972; Ansell, 2014; Tertytchnaya and De Vries, 2019). As a consequence, wealth leads to lower risk-aversion (Zanetti, 2014; Pahontu, 2020). Despite these observations, the role of wealth has gone unstudied as a mechanism enabling vot-

ers opt for more risky political propositions, such a large-scale changes from the status quo.

We applied this question to the case of Brexit. We demonstrated how variation in personal wealth enabled wealthier individuals to vote with their Brexit preferences, and less wealthy individuals to vote against them. Furthermore, we provide evidence that the mechanism linking wealth and higher Leave support is dependent on wealthy voters' expectation that Brexit would not impact their personal finances, given self-insurance, and that an increase in wealth lowers risk-aversion. We explored these relationships using observational and experimental data across three separate contexts: a cross-sectional electoral study, a wealth panel data and a survey experiment.

While this finding supports the literature on wealth as insurance, it is a novel contribution to the literature on Brexit, which has otherwise focused on the benefits of leaving the EU, rather than consideration of the offsetting costs. Thus, researchers show that Remain voting increases in wealthier areas (Ansell, 2019; Adler and Ansell, 2020), and that economic grievances were associated with a higher likelihood of voting for Brexit (Clarke et al., 2017; Colantone and Stanig, 2018; Carreras et al., 2019; Fetzer, 2019; Green et al., 2020). Our individual wealth findings reveal that income and wealth work in additive but opposite directions in informing a Brexit vote – while people on higher incomes were less likely to support Brexit, they were more likely to do so if they had higher wealth; and while people on lower incomes were more likely to support Brexit, they were less likely to do so if they lacked wealth. Furthermore, the effect of wealth is greater for people who had some preference for greater independence from the EU. Wealth allows people to vote with their preferences when those preferences entail some costs. Those without wealth cannot as easily afford to take the economic risks of supporting Britain's exit from the European Union.

This paper has important implications for a deeper understanding of the case of

Brexit in the UK. It may also apply to other cases where voters are faced with high-stakes choices where their preferences may conflict with some economic risk, such as other referendums on EU membership, secession votes, and perhaps even some national election choices where the options are for radical and economically risky alternatives. Lastly, our findings show the importance of wealth for understanding political behavior: it cushions individuals from the economic risks associated with a vote for a major change to the status quo.

Appendix

IV.A Appendix A – Measurement Validation

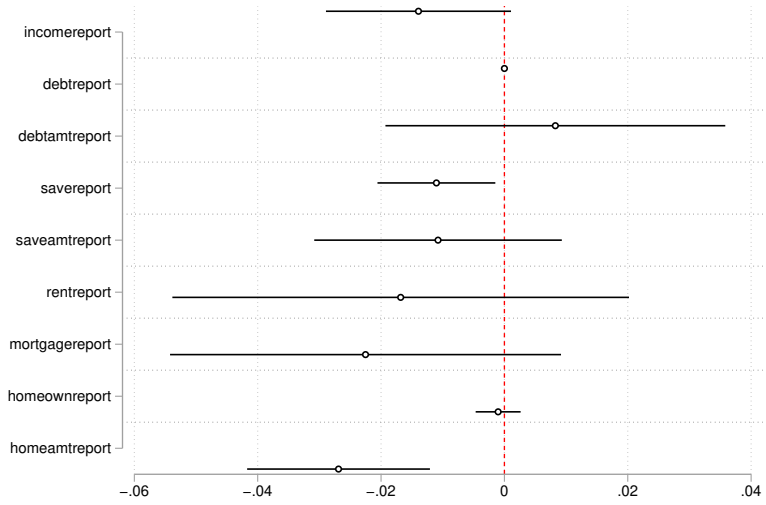
Measuring respondents' wealth in surveys is difficult insofar as respondents may under-report their financial difficulties (e.g. debts, unemployment spells) and over-report more favourable aspects, such as employment status, savings. In order to explore this issue we report in Table IV.A.1 a number of key indicators in determining or constructing the income and wealth measures and their comparative distribution in the BES and BoE samples and the UK population. We rely on several sources of official statistics including the Office for National Statics for data on population estimation and labour market statistics, the Higher Education Statistics Agency for data on student population and on the 2017/18 English Housing Survey for data on home ownership, average mortgage and rent payments. The referenced BES and BoE data are weighted. On most measures, the indicators' central tendencies is impressively similar to that provided by official statistics.

Table IV.A.1: Measurement Validation against Official Statistics

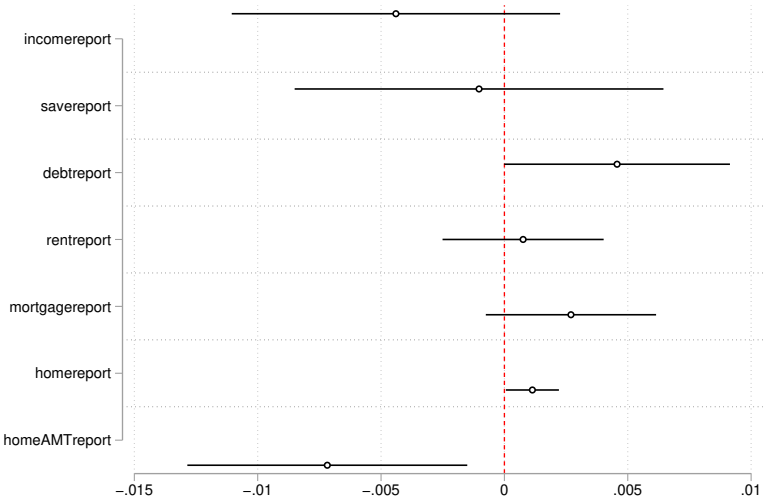
Indicator	BES Sample	BoE Sample	UK Population	Source
Unemployment	1.87	3.77	2.07	ONS Unempl & Pop
Student Uni (Current)	2.43	4.7	3.52	HESA 2017/18
Home Owners	71.23	63.17	63.5	EHS
Private Renters	19.56	19.63	19.5	EHS
Mean Home Price	270k	263k	240k	HPI

FIGURE IV.A.1: LEAVER STATUS AND INCOME AND WEALTH REPORTING

(A) BES SAMPLE



(B) BOE SAMPLE



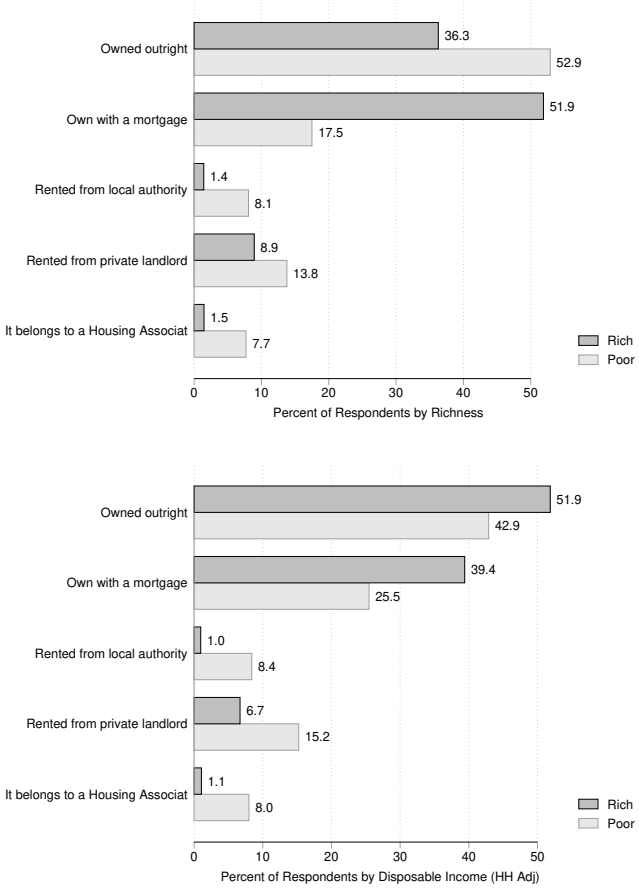
NOTE: BES models include controls for gender, age, education, marital status, authoritarian values, employment status and BoE include controls for gender, education, age, employment status. Robust standard errors are reported for the BES sample and clustered robust standard errors for BoE sample.

IV.B Appendix B – Distribution of Wealth and Income

IV.B.1 Distribution in BES Sample

As in Meltzer and Richard (1981), we define an individual as *poor* if she earns an income below the mean in the sample and someone as *rich* if they are above the mean. We differentiate in what follows between the simple, household size unadjusted income and the household adjusted disposable income (accounting for outgoings such as mortgage or rent payments). Both income measures are standardized with mean 0 and standard deviation 1.

FIGURE IV.B.1: DISTRIBUTION OF HOME OWNERSHIP BY INCOME



NOTE: The top panel plots the distribution of home ownership by the unadjusted income measure. The bottom panel reports it by the household adjusted disposable income (accounting for rent and mortgage payments). Both measures are standardized with mean 0 and standard deviation 1.

FIGURE IV.B.2: DISTRIBUTION OF INCOME BY SAVINGS

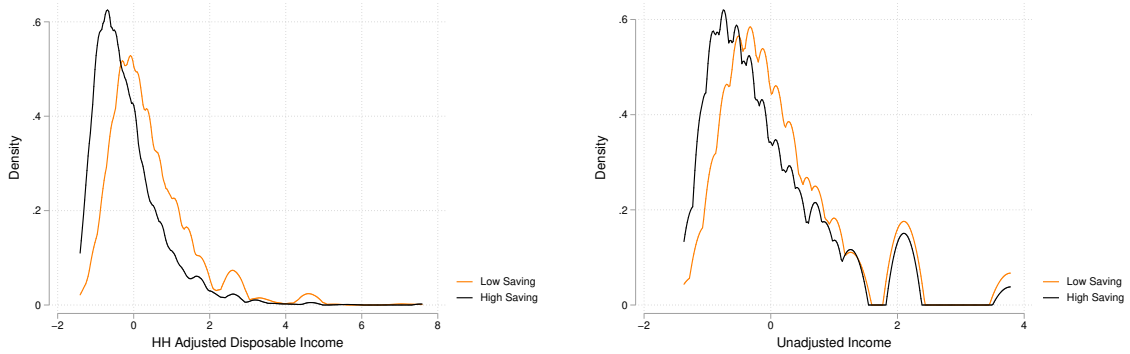


FIGURE IV.B.3: DISTRIBUTION OF INCOME BY DEBT

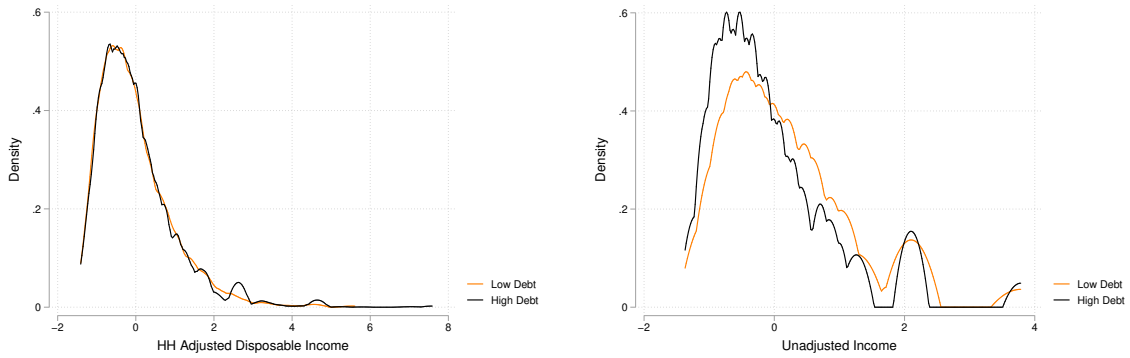
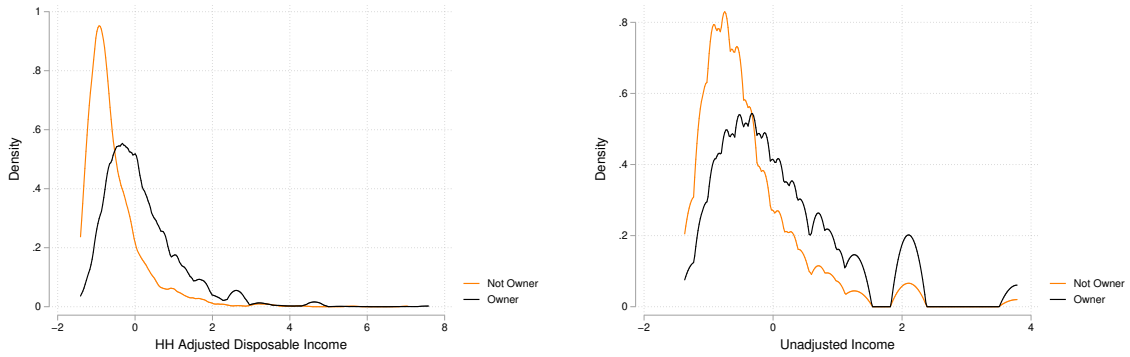
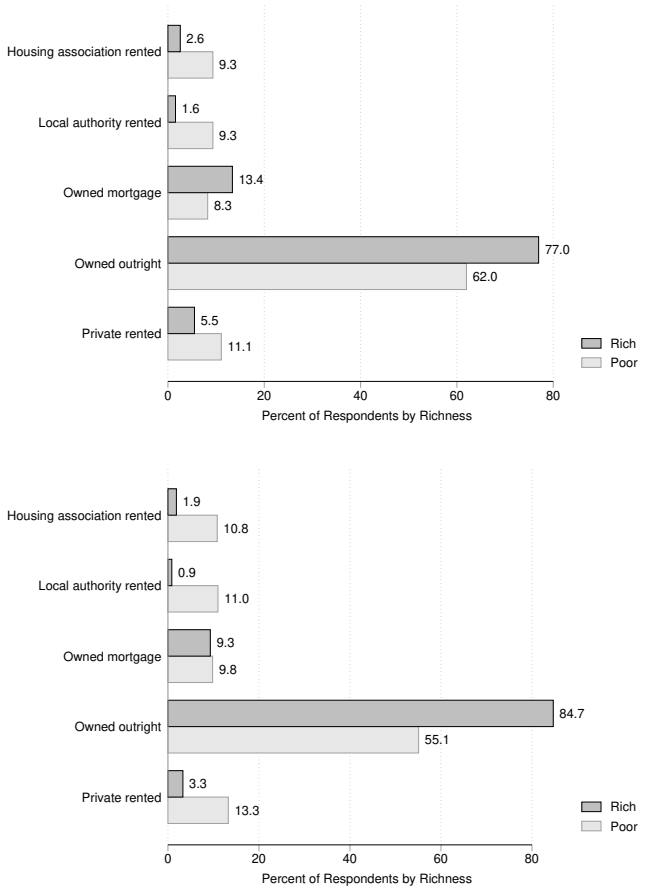


FIGURE IV.B.4: DISTRIBUTION OF INCOME BY OWNERSHIP



IV.B.2 Distribution in BoE Sample

FIGURE IV.B.5: DISTRIBUTION OF HOME OWNERSHIP BY INCOME



NOTE: The top panel plots the distribution of home ownership by the unadjusted income measure. The bottom panel reports it by the household adjusted disposable income (accounting for rent and mortgage payments). Both measures are standardized with mean 0 and standard deviation 1.

FIGURE IV.B.6: DISTRIBUTION OF INCOME BY SAVINGS

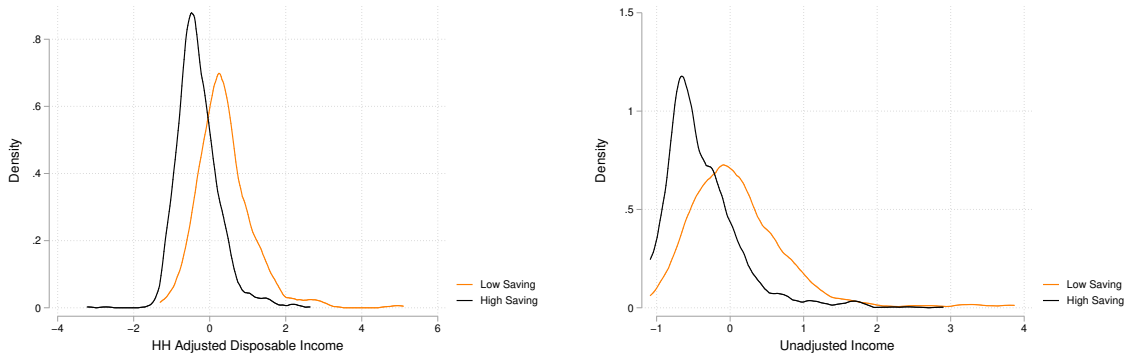


FIGURE IV.B.7: DISTRIBUTION OF INCOME BY DEBT

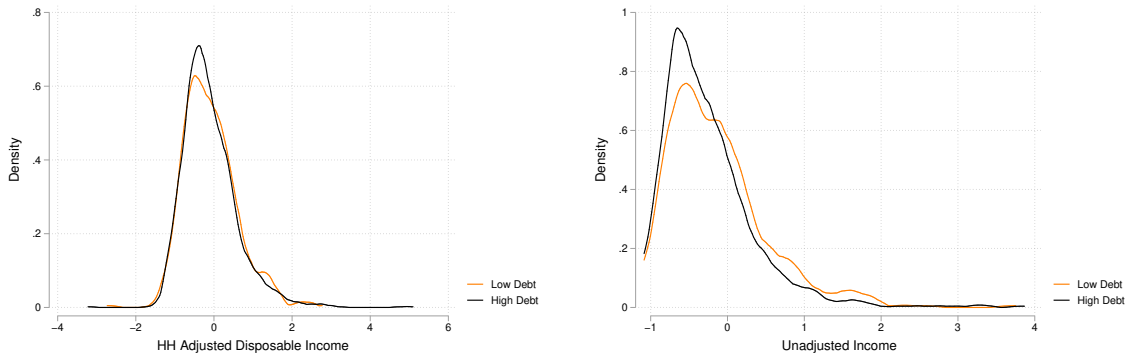
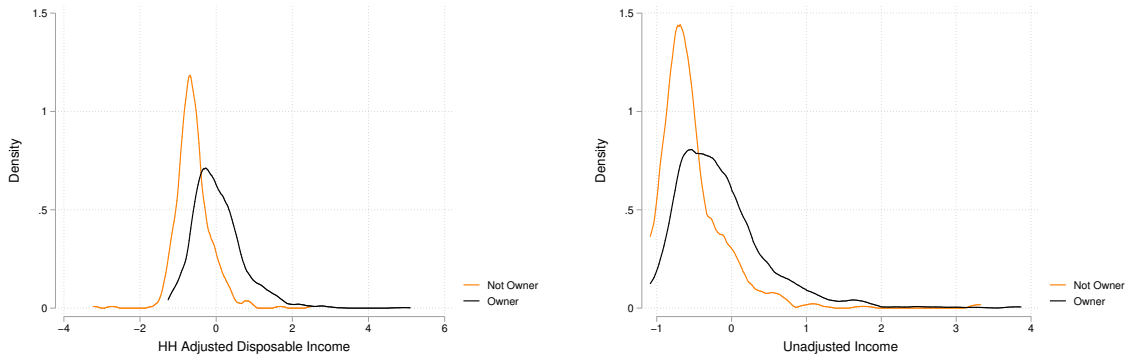


FIGURE IV.B.8: DISTRIBUTION OF INCOME BY OWNERSHIP



IV.C Appendix C – Who's Wealthy?

FIGURE IV.C.1: MEDIAN HOME VALUE AT LSOA (2017 PRICES)

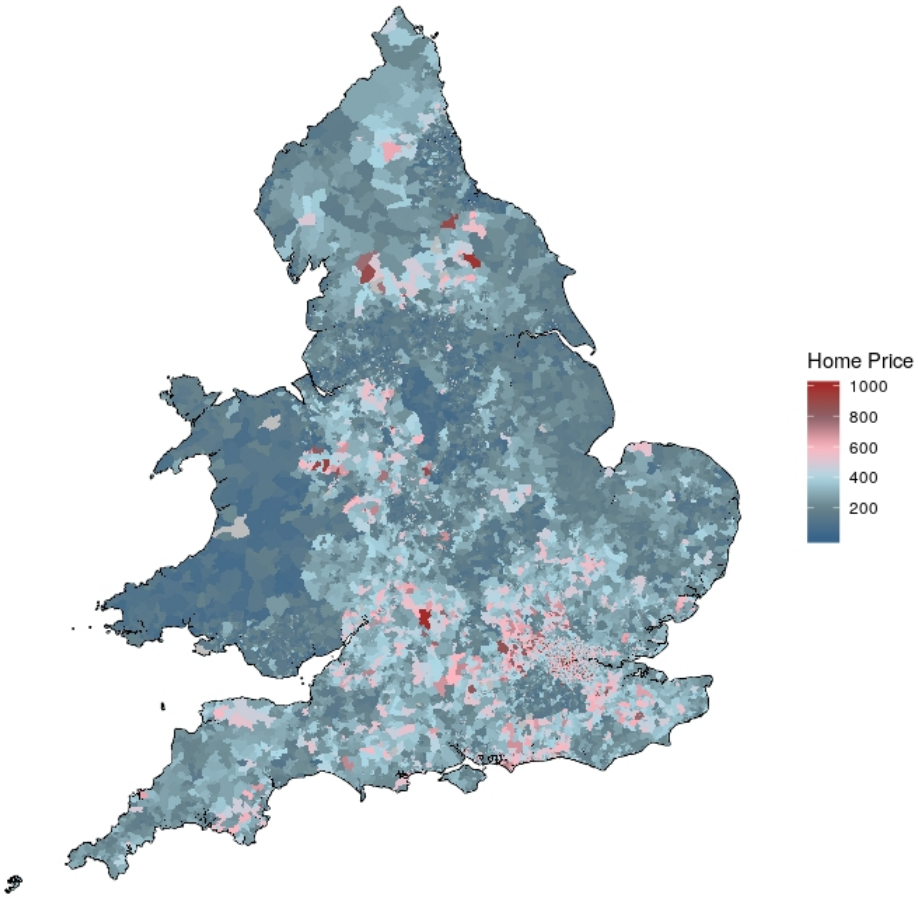
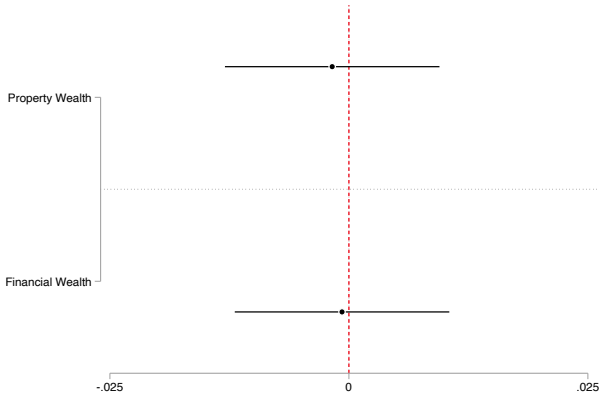
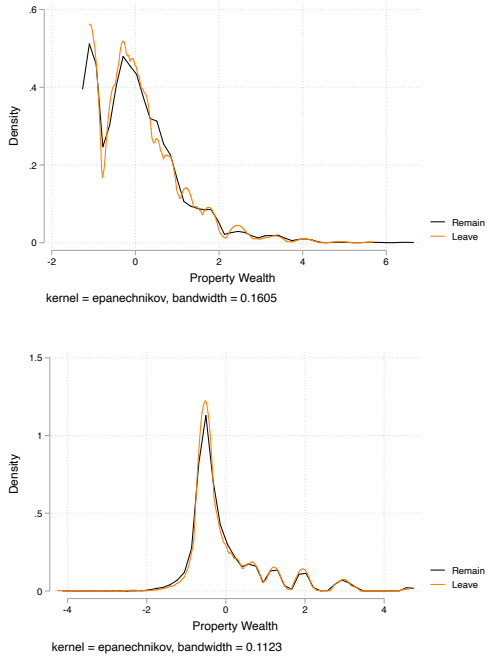


FIGURE IV.C.2: ARE LEAVERS WEALTHIER?

(A) DIFFERENCES IN MEANS



(B) DIFFERENCES IN DISTRIBUTIONS



NOTE: These results are based on the BES Wealth Module. K-S tests, further confirms that the two distributions in panel (b) are not statistically different from one another.

FIGURE IV.C.3: PROPERTY WEALTH BY DEMOGRAPHIC CHARACTERISTICS

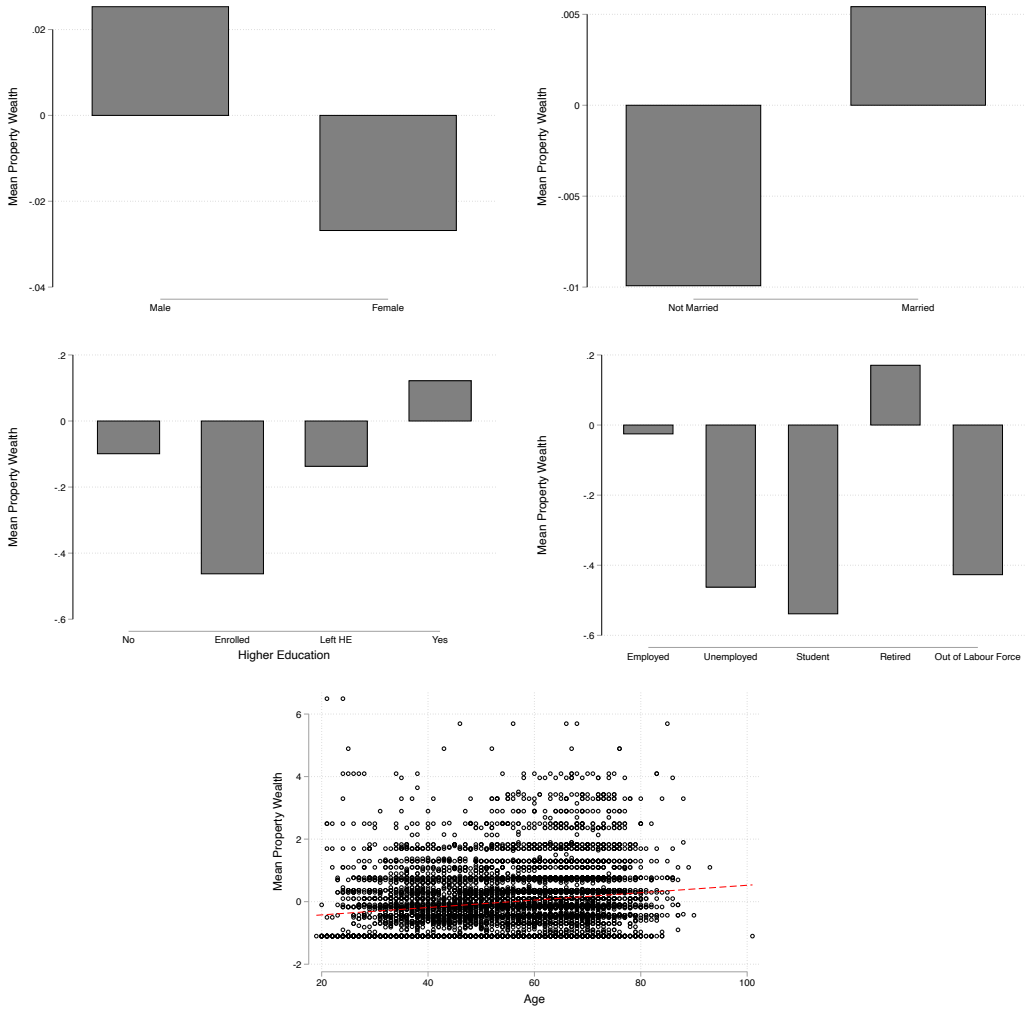
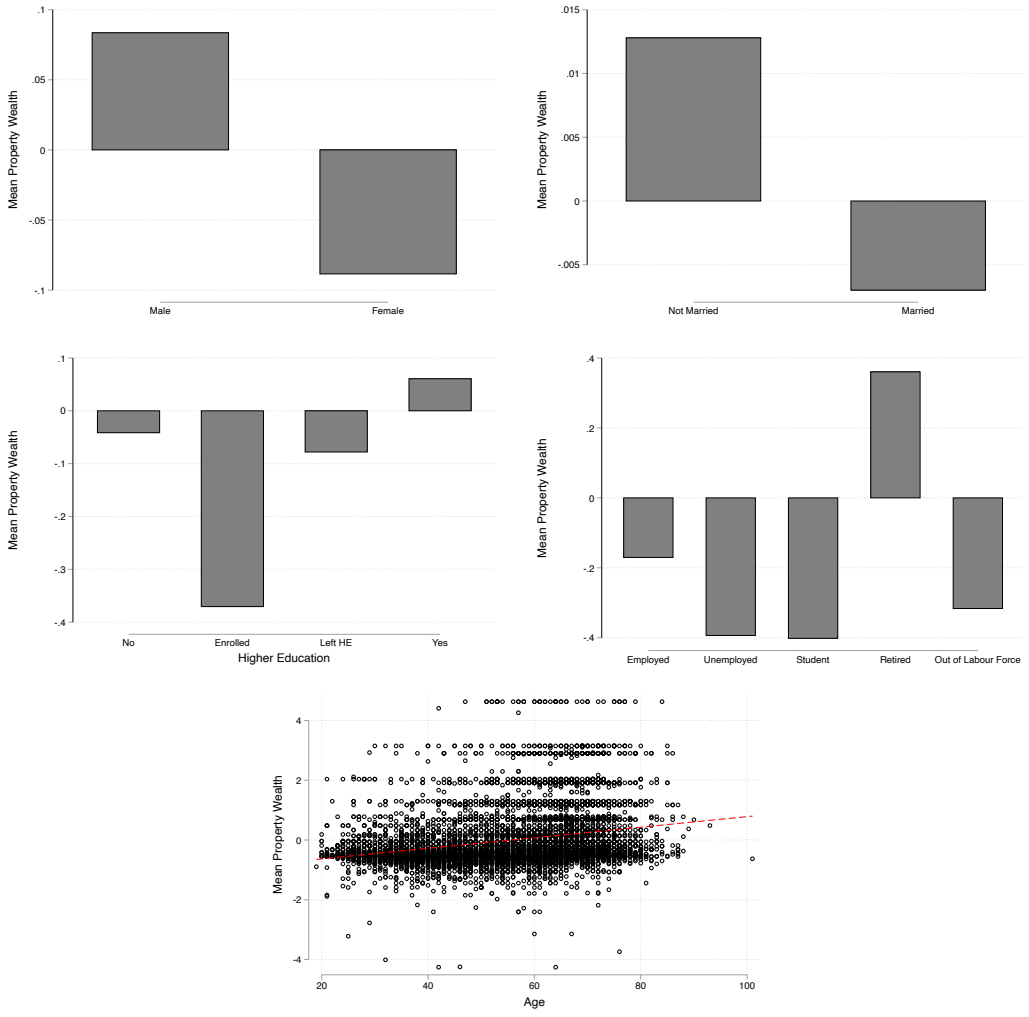


FIGURE IV.C.4: FINANCIAL WEALTH BY DEMOGRAPHIC CHARACTERISTICS



IV.D Appendix D – Main Results Robustness

TABLE IV.D.1: MAIN RESULTS WITH DK

	(1)	(2)	(3)
HH Adj Financial Wealth	-0.005	-0.005	-0.004
	(0.005)	(0.006)	(0.006)
HH Adj Property Wealth	0.016***	0.014**	0.014**
	(0.006)	(0.006)	(0.006)
Income	Unadj	HH Adj	Disposable
Observations	7,627	7,627	7,627
R-squared	0.245	0.244	0.244

NOTE: Dependent variable, leave vote intention, is binary (1=Leave). All models include controls for gender, age, education, marital status, employment status, authoritarian values and respondent's location based on the ONS Super Area Group classification. Robust standard errors in parentheses.*** p<0.01, ** p<0.05, * p<0.1

FIGURE IV.D.1: SURVEY EXPERIMENT RANDOMIZATION CHECK

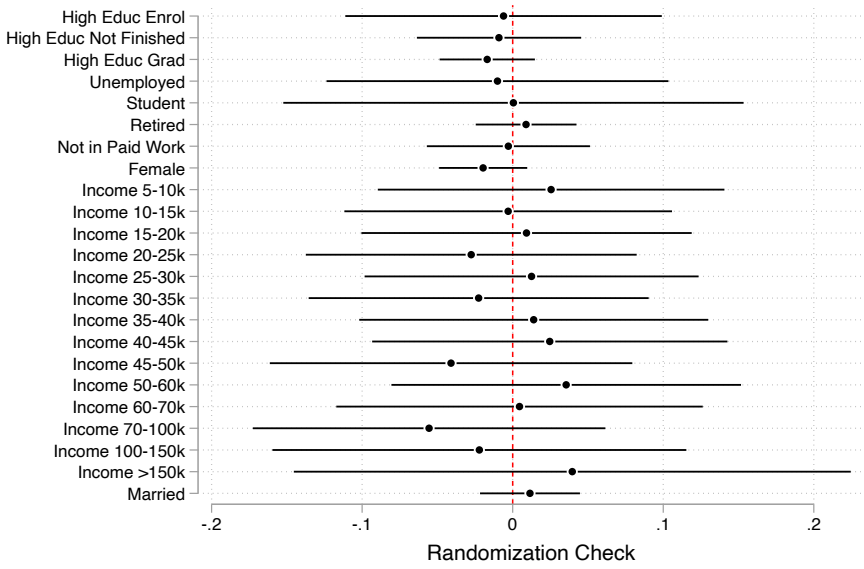
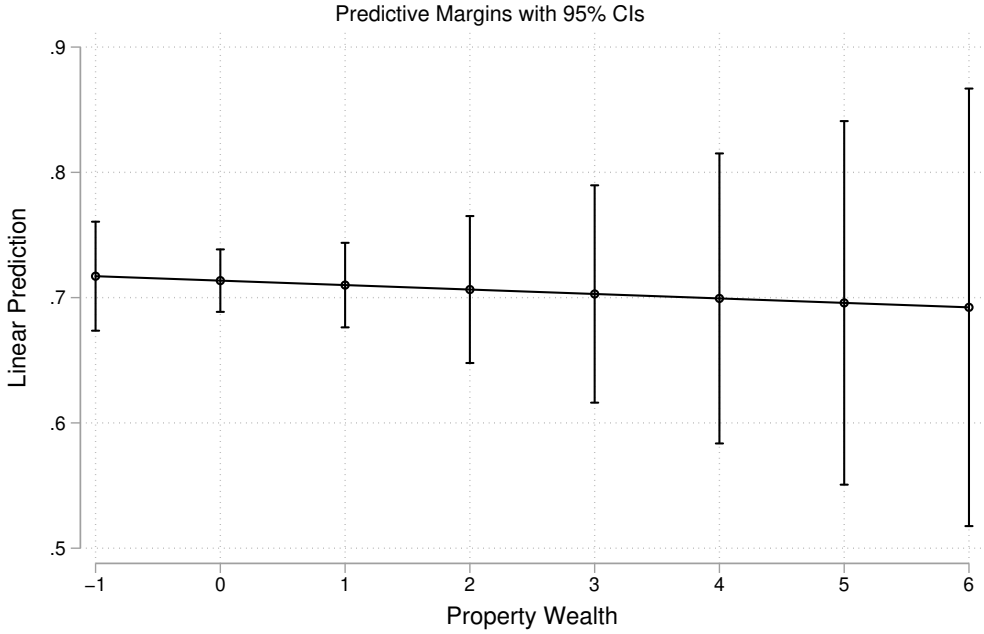


FIGURE IV.D.2: RESPONDENTS DO NOT BELIEVE POST-BREXIT HOME PRICES ARE CHANGING AS A FUNCTION OF PROPERTY WEALTH



NOTE: Dependent variable is binary and takes the value 1 if the respondent believes home prices are changing (either decreasing or increasing). Model includes time dummies for post-Brexit years and controls for income, gender, age, education, region, work status. Property wealth is denoted by the respondents' home value, standardized to mean 0 and standard deviation 1.

IV.E Appendix E – Aggregate vs Individual Results

FIGURE IV.E.1: LEAVE SUPPORT AGGREGATE VS INDIVIDUAL

(A) INDIVIDUAL LEVEL



(B) LSOA LEVEL

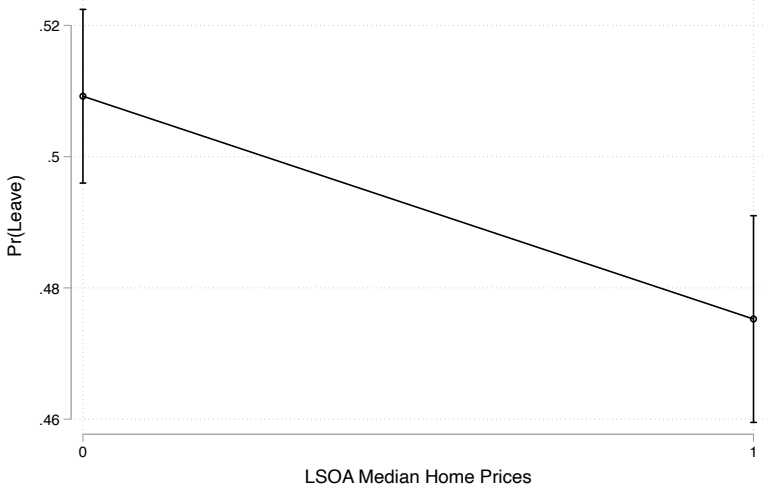
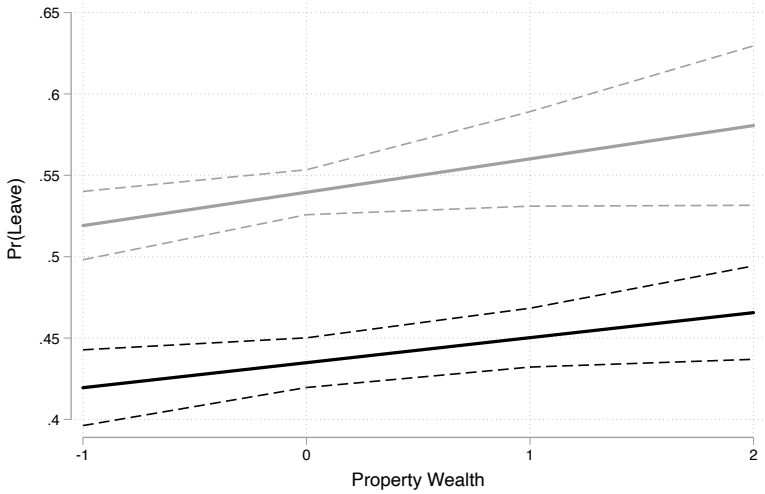


FIGURE IV.E.2: BES MAIN RESULTS BY HIGH/LOW LSOA MEDIAN HOME PRICES



NOTE: Replication of model (4) from Table IV.3. In grey, the analysis is run among LSOAs where the median home prices are below the *average* median home prices in the country. Models include controls for gender, age, education, work status, region, authoritarian values, marital status.

References

Abadie, Alberto, Diamond, Alexis, and Hainmueller, Jens (2015). Comparative Politics and the Synthetic Control Method. *American Journal of Political Science*, 59(2):495–510.

Adler, David and Ansell, Ben (2020). Housing and Populism. *West European Politics*, 43(2):344–365.

Anderson, Gareth, Bunn, Philip, Pugh, Alice, and Uluc, Arzu (2016). The Bank of England/NMG survey of Household Finances. *Fiscal Studies*, 37(1):131–152.

Ansell, Ben (2014). The Political Economy of Ownership: Housing Markets and the Welfare State. *American Political Science Review*, 108(2):383–402.

Ansell, Ben (2019). The Politics of Housing. *Annual Review of Political Science*, 22:165–185.

Atikcan, Ece Özlem (2015). *Framing the European Union: The Power of Political Arguments in Shaping European Integration*. Cambridge University Press.

Atikcan, Ece Ozlem., Nadeau, Richard, and Belanger, Eric (2020). *Framing Risky Choices: Brexit and the Dynamics of High-Stakes Referendums*. McGill-Queen's University Press.

Autor, David, Dorn, David, Hanson, Gordon, and Majlesi, Kaveh (2019). Importing Political Polarization? The Electoral Consequences of Rising Trade Exposure. *National Bureau of Economic Research*. `https://www.nber.org/papers/w22637`.

Banks, James, Blundell, Richard, and Smith, James P (2002). Wealth Portfolios in the UK and the US. Technical report, National Bureau of Economic Research. `https://www.nber.org/papers/w9128`.

Barsky, Robert B, Juster, F Thomas, Kimball, Miles S, and Shapiro, Matthew D (1997). Preference Parameters and Behavioral Heterogeneity: An Experimental Approach in the Health and Retirement Study. *The Quarterly Journal of Economics*, 112(2):537–579.

Bobo, Lawrence D (2017). Racism in Trump's America: Reflections on Culture, Sociology, and the 2016 US Presidential Election. *The British Journal of Sociology*, 68:S85–S104.

Born, Benjamin, Muller, Gernot J, Schularick, Moritz, and Sedlavcek, Petr (2019). The Costs of Economic Nationalism: Evidence from the Brexit Experiment. *The Economic Journal*, 129(623):2722–2744.

Breinlich, Holger, Leromain, Elsa, Novy, Dennis, and Sampson, Thomas (2017). The Consequences of the Brexit Vote for UK Inflation and Living Standards: First Evidence. *CEP Technical Report*.

Browning, Martin and Crossley, Thomas F (2001). The Life-Cycle Model of Consumption and Saving. *Journal of Economic Perspectives*, 15(3):3–22.

Carreras, Miguel, Irepoglu Carreras, Yasemin, and Bowler, Shaun (2019). Long-term Economic Distress, Cultural Backlash, and Support for Brexit. *Comparative Political Studies*, 52(9):1396–1424.

Cavaille, Charlotte and Ferwerda, Jeremy (2017). How Distributional Conflict over Public Spending Drives Support for Anti-Immigrant Parties. `https://ideas.repec.org/p/cge/wacage/328.html`.

Clarke, Harold D, Goodwin, Matthew, and Whiteley, Paul (2017). *Brexit: Why Britain Voted to Leave the European Union*. Cambridge: Cambridge University Press.

Colantone, Italo and Stanig, Piero (2018). Global Competition and Brexit. *American Political Science Review*, 112(2):201–218.

Conley, Dalton and Gifford, Brian (2006). Home Ownership, Social Insurance, and the Welfare State. *Sociological Forum*, 21(1):55.

Cramer, Katherine J (2016). *The Politics of Resentment: Rural Consciousness in Wisconsin and the Rise of Scott Walker*. University of Chicago Press.

Crawford, Rowena, Innes, Dave, and O'Dea, Cormac (2016). Household Wealth in Great Britain: Distribution, Composition and Changes 2006–12. *Fiscal Studies*, 37(1):35–54.

Dancygier, Rafaela M. (2010). *Immigration and Conflict in Europe*. Cambridge University Press.

Dhingra, Swati, Huang, Hanwei, Ottaviano, Gianmarco, Paulo Pessoa, João, Sampson, Thomas, and Van Reenen, John (2017). The Costs and Benefits of Leaving the EU: Trade Effects. *Economic Policy*, 32(92):651–705.

Eckles, David L, Kam, Cindy D, Maestas, Cherie L, and Schaffner, Brian F (2014). Risk Attitudes and the Incumbency Advantage. *Political Behavior*, 36(4):731–749.

Eggers, Andrew C and Fouirnaies, Alexander B (2014). The Economic Impact of Economic News. `http://andy.egge.rs/papers/Eggers_Fouirnaies_Recessions.pdf`.

Ehrlich, Isaac and Becker, Gary S (1972). Market Insurance, Self-Insurance, and Self-Protection. *Journal of Political Economy*, 80(4):623–648.

Evans, Geoffrey, Carl, Noah, and Dennison, James (2018). Brexit: The Causes and Consequences of the UK's Decision to Leave the EU. *Europe's Crises*, pages 380–404.

Evans, Geoffrey and Mellon, Jonathan (2019). Immigration, Euroscepticism, and the rise and fall of UKIP. *Party Politics*, 25(1):76–87.

Evans, Geoffrey and Menon, Anand (2017). *Brexit and British Politics*. John Wiley & Sons.

Fernandez, Raquel and Rodrik, Dani (1991). Resistance to Reform: Status Quo Bias in the Presence of Individual-Specific Uncertainty. *The American Economic Review*, pages 1146–1155.

Fetzer, Thiemo (2019). Did Austerity Cause Brexit? *American Economic Review*, 109(11):3849–86.

Fetzer, Thiemo, Becker, Sascha O, and Novy, Dennis (2018). Austerity, Immigration or Globalisation: Was Brexit Predictable? *Social Market Foundation Policy Report*.

Fieldhouse, Edward, Green, Jane, Evans, Geoffrey, Mellon, Jonathan, Prosser, Christopher, Schmitt, Hermann, and van der Eijk, Cees (2019). *Electoral Shocks: The Volatile Voter in a Turbulent World*. Oxford University Press.

Fieldhouse, Edward, Green, Jane, Evans, Geoffrey, Schmitt, Hermann, van der Eijk, Cees, Mellon, Jon, and Prosser, Chris (2018). British Election Study Internet Panel Wave 14.

Ford, Robert and Goodwin, Matthew J (2014). *Revolt on the Right: Explaining Support for the Radical Right in Britain*. Routledge.

Gest, Justin (2016). *The New Minority: White Working Class Politics in an Age of Immigration and Inequality*. Oxford University Press.

Gest, Justin, Reny, Tyler, and Mayer, Jeremy (2018). Roots of the Radical Right: Nostalgic Deprivation in the United States and Britain. *Comparative Political Studies*, 51(13):1694–1719.

Gidron, Noam and Hall, Peter A (2017). The Politics of Social Status: Economic and Cultural Roots of the Populist Right. *The British Journal of Sociology*, 68:S57–S84.

Goodwin, Matthew, Hix, Simon, and Pickup, Mark (2018). For and Against Brexit: A Survey Experiment of the Impact of Campaign Effects on Public Attitudes Toward EU Membership. *British Journal of Political Science*, 50:1–15.

Goodwin, Matthew and Milazzo, Caitlin (2017). Taking Back Control? Investigating the Role of Immigration in the 2016 Vote for Brexit. *The British Journal of Politics and International Relations*, 19(3):450–464.

Green, Jane (2007). When Voters and Parties Agree: Valence Issues and Party Competition. *Political Studies*, 55(3):629–655.

Green, Jane, Hellwig, Tim, and Fieldhouse, Edward (2020). Who Gets What: The Economy, Relative Gains, and Brexit.

Guiso, Luigi and Paiella, Monica (2008). Risk Aversion, Wealth, and Background Risk. *Journal of the European Economic Association*, 6(6):1109–1150.

Hagenaars, Aldi JM, De Vos, Klaas, Asghar Zaidi, M, et al. (1994). Poverty statistics in the late 1980s: Research based on micro-data.

Hierro, Maria Jose and Queralt, Didac (2020). The Divide Over Independence: Explaining Preferences for Secession in an Advanced Open Economy. *American Journal of Political Science*.

Hobolt, Sara Binzer (2009). *Europe in Question: Referendums on European Integration*. Oxford University Press Oxford.

Hobolt, Sara B (2016). The Brexit Vote: A Divided Nation, A Divided Continent. *Journal of European Public Policy*, 23(9):1259–1277.

Hryshko, Dmytro, Luengo-Prado, María José, and Sørensen, Bent E (2011). Childhood Determinants of Risk Aversion: The Long Shadow of Compulsory Education. *Quantitative Economics*, 2(1):37–72.

Iakhnis, Evgeniia, Rathbun, Brian, Reifler, Jason, and Scotto, Thomas J (2018). Populist Referendum: Was 'Brexit' an Expression of Nativist and Anti-Elitist Sentiment? *Research & Politics*, 5(2).

Ivarsflaten, Elisabeth (2008). What Unites Right-Wing Populists in Western Europe? Re-examining Grievance Mobilization Models in Seven Successful Cases. *Comparative Political Studies*, 41(1):3–23.

Jennings, Will and Stoker, Gerry (2017). Tilting Towards the Cosmopolitan Axis? Political Change in England and the 2017 General Election. *The Political Quarterly*, 88(3):359–369.

Larsen, Martin Vinæs, Hjorth, Frederik, Dinesen, Peter Thisted, and Sønderskov, Kim Mannemar (2019). When Do Citizens Respond Politically to the Local Economy? Evidence from Registry Data on Local Housing Markets. *American Political Science Review*, 113(2):499–516.

Lewis-Beck, Michael S, Nadeau, Richard, and Foucault, Martial (2013). The Compleat Economic Voter: New Theory and British Evidence. *British Journal of Political Science*, 43(2):241–261.

Malmendier, Ulrike and Nagel, Stefan (2011). Depression Babies: Do Macroeconomic Experiences Affect Risk Taking? *The Quarterly Journal of Economics*, 126(1):373–416.

Masatlioglu, Yusufcan and Ok, Efe A (2005). Rational Choice with Status Quo Bias. *Journal of Economic Theory*, 121(1):1–29.

Meltzer, Allan H and Richard, Scott F (1981). A Rational Theory of the Size of Government. *Journal of Political Economy*, 89(5):914–927.

Moore, Jeffrey C and Welniak, Edward J (2000). Income Measurement Error in Surveys: A Review. *Journal of Official Statistics*, 16(4):331.

Mudde, Cas (2010). The Populist Radical Right: A Pathological Normalcy. *West European Politics*, 33(6):1167–1186.

Mutz, Diana C (2018). Status Threat, Not Economic Hardship, Explains the 2016 Presidential Vote. *Proceedings of the National Academy of Sciences*, 115(19):E4330–E4339.

Norris, Pippa and Inglehart, Ronald (2019). *Cultural Backlash: Trump, Brexit, and the Rise of Authoritarian Populism*. New York: Cambridge University Press.

Olson, Joel (2008). Whiteness and the Polarization of American Politics. *Political Research Quarterly*, 61(4):704–718.

Pahontu, Raluca L (2020). The Democrat Disaster: Hurricane Exposure, Risk Aversion and Insurance Demand. `https://ssrn.com/abstract=3515282`.

Paravisini, Daniel, Rappoport, Veronica, and Ravina, Enrichetta (2017). Risk Aversion and Wealth: Evidence from Person-to-Person Lending Portfolios. *Management Science*, 63(2):279–297.

Pardos-Prado, Sergi and Xena, Carla (2019). Skill Specificity and Attitudes Toward Immigration. *American Journal of Political Science*, 63(2):286–304.

Samuelson, William and Zeckhauser, Richard (1988). Status Quo Bias in Decision Making. *Journal of Risk and Uncertainty*, 1(1):7–59.

Sands, Melissa L and de Kadt, Daniel (2019). Local Exposure to Inequality Among the Poor Increases Support for Taxing the Rich. `https://osf.io/preprints/socarxiv/9ktg2/`.

Schaffner, Brian F., MacWilliams, Matthew, and Nteta, Tatishe (2018). Hostile Sexism, Racism Denial, and the Historic Education Gap in Support for Trump. In Cavari, Amnon, Powell, Richard J., and Mayer, Kenneth R., editors, *The 2016 Presidential Election: The Causes and Consequences of a Political Earthquake*. Lexington Books.

Scheve, Kenneth and Stasavage, David (2001). What Determines Individual Trade-Policy Preferences? *Journal of International Economics*, 54(2):267–292.

Scheve, Kenneth and Stasavage, David (2012). Democracy, War, and Wealth: Lessons from Two Centuries of Inheritance Taxation. *American Political Science Review*, 106(1):81–102.

Scheve, Kenneth and Stasavage, David (2017). Wealth Inequality and Democracy. *Annual Review of Political Science*, 20:451–468.

Steenbergen, Marco R and Siczek, Tomasz (2017). Better the Devil you Know? Risk-taking, Globalization and Populism in Great Britain. *European Union Politics*, 18(1):119–136.

Tertytchnaya, Katerina and De Vries, Catherine E (2019). The Political Consequences of Self-Insurance: Evidence from Central-Eastern Europe, the Caucasus and Central Asia. *Political Behavior*, 41(4):1047–1070.

Tversky, Amos and Kahneman, Daniel (1991). Loss Aversion in Riskless Choice: A Reference-Dependent Model. *The Quarterly Journal of Economics*, 106(4):1039–1061.

Van Hauwaert, Steven M and Van Kessel, Stijn (2018). Beyond Protest and Discontent: A Cross-National Analysis of the Effect of Populist Attitudes and Issue Positions on Populist Party Support. *European Journal of Political Research*, 57(1):68–92.

Zanetti, Francesco (2014). Housing and Relative Risk Aversion. *Economics Letters*, 123(1):23–25.

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Conclusion

'Human beings have invented the concept of *risk* to help them understand and cope with the dangers and uncertainties of life' (Kahneman, 2011). *By Popular Demand* followed individuals across three market economies on an economic rollercoaster to explore voter decision making under risk. The manuscript provides a collection of papers that advance a bottom up framework exploring how variation in individual experiences impact on their insurance demand and political behaviour.

Together, the three papers make several important theoretical and empirical contributions. The papers introduce novel measures of risk and clarify best measurement practices to avoid ecological fallacies, they introduce private insurance as an option, and show that risk aversion is time variant, and decreases in wealth. *By Popular Demand*, concludes that an increase in risk aversion or exposure to risk increases support for redistribution, the Left, and a status quo change.

The manuscript relaxes important assumptions in the political economy literature. First, *Divisive Jobs* suggested that existing work imputes labour market risk from group-level characteristics and is static in nature. It proposes therefore an individual level, dynamic account of risk inferred from employment characteristics – perceived job security, job tenure and contract type. These characteristics, importantly, account for

the possibility that one's experience of risk may change across time. Moreover, the paper finds that experiencing higher labour market risk positively impacts individuals' demand for welfare spending even when accounting for time-invariant unobserved heterogeneity, such as selection into an occupation, educational attainment, upbringing or motivation.

Second, *The Democrat Disaster*, originated from the observation that scholars of comparative politics have largely neglected voter behaviour under risk. Even when this was studied, the resultant work predominantly estimates compound treatment effects, emergent either from self-selection into unfortunate circumstances of exposure not only to risk but also to direct losses. The paper proposes a research design favourable to study the effect of risk on vote choice by exploring individuals' decision making in areas *nearly*-hit by hurricanes in the United States. The paper further explores likely mechanisms linking exposure to hurricanes to voting behaviour, and notes that conventional explanations related to religiosity, authority, or information fail to explain the identified effect. Instead, I propose that Republican gains are driven by voters' spending on private insurance and increased willingness to take risks when spared from disaster. I therefore advance an alternative theoretical explanation for vote choice under risk. Importantly, this paper tests the existence of a time-variant component in risk aversion and concludes that risk attitudes may change over time.

Third, *Mind The Gap*, explores wealthy individuals' motivation for supporting a status-quo change, Brexit. So far, the literature on populism has focused on grievances, and thus identified support among lower income voters. It was simply assumed that the relationship would hold among richer, and in particular wealthier voters. The paper proposes an insurance-based mechanism that then expects wealthier individuals to support – rather than oppose – Brexit. As assets can cushion against uncertain economic circumstances triggered by a change to the status quo, wealthy voters are

therefore able to vote with their Brexit preferences at higher rates than those lacking the same insurance. We suggest that the underlying mechanism sees wealthier, privately insured voters, more willing to take financial risks. Therefore, the paper identifies that, at least in the case of Brexit, income and wealth work in additive, but opposite directions.

Roads Less Travelled

By Popular Demand leaves room for future work on a number of dimensions. The manuscript relies on some assumptions that could be relaxed, such as voters' full political participation. There may also be a number of implications that future research could explore such as institutional variation in the provision of public and private insurance, or individual variation in exposure to different risks and their relation to other areas of the welfare state.

Preference Aggregation and Participation

As *Divisive Jobs* and *Mind the Gap* show, there is more to learn about individuals' economic grievances and how they impact their political behaviour. To the extent that preferences are not easily aggregated as suggested in the first paper, that may explain a spike among low-income or more precarious voters in support of populist appeals, even when they are holding relatively valuable assets, as shown in the latter paper.

Implicitly, both papers assume full participation in the political process and discount parties' mobilizing strategies, if any. As earlier work has shown, low income voters – however, not necessarily those exposed to risk – tend to participate less in politics, and this fact may explain a decreasing aggregate support for the Left (Anderson and Beramendi, 2012). Therefore, there may not be a direct translation between indi-

viduals' preferences or voting intention identified above and actual aggregate outcomes.

Substitutes and Complements

The manuscript assumes political outcomes to follow directly from voters' preferences and demands. Equally, each paper explores within country variation in individual risk, downplaying therefore a comparative element between different market economies. As pointed out in the preface, institutional variation may have important implications on how voters from different nation states cope with risk (Esping-Andersen, 1990; Gingrich and Ansell, 2012). I expect that to be true not only in regard to workers' rights or employment protection legislation, but also with respect to the effects of a state's welfare system, stage of development and type of market economy in shifting insurance away from the public to private agents – whether that is insurance companies or individuals themselves. It may not be a coincidence that I identify the importance of accounting for private insurance in the United Kingdom and the United States – two developed, liberal market economies. Especially in the US case, I find in *The Democrat Disaster* that public insurance is substituting support for social insurance. Whether private insurance acts in a complementary manner in other contexts is an interesting avenue for future research.

Not Risking Enough

Voter decision making is more complex than what the manuscript portrayed so far. So is welfare state support, among others. *By Popular Demand* is predominantly concerned with insurance for income replacement associated with potential shocks such as unemployment spells, hurricane related damage, or Brexit. Other (related) areas of the welfare state have thus been muted. One simplifying assumption made in the manuscript, partly for methodological reasons, sees risks occurring one by one. This

magnifying glass technique on one risk at a time has been valuable as it provides convincing causal estimates. Zooming out, it remains unclear how voter decision making is impacted once individuals are exposed to several risks or indeed different types. Do voters respond in the same way to multiple risks? Are some risks more important than others? Will those *nearly* missed always turn to private insurance? Or, is there a point after which no addition to one's background risk influences any longer their decision making process? Pahontu et al. (2020) address some of these aspects, but these are far reaching questions that future research could explore. After all, the biggest risk is not taking any risk.

References

Anderson, Christopher J and Beramendi, Pablo (2012). Left Parties, Poor Voters, and Electoral Participation in Advanced Industrial Societies. *Comparative Political Studies*, 45(6):714–746.

Esping-Andersen, Gosta (1990). *The Three Worlds of Welfare Capitalism*. Princeton University Press.

Gingrich, Jane and Ansell, Ben (2012). Preferences in Context: Micro Preferences, Macro Contexts, and The Demand for Social Policy. *Comparative Political Studies*, 45(12):1624–1654.

Kahneman, Daniel (2011). *Thinking, Fast and Slow*. Macmillan.

Pahontu, Raluca L, Hooijer, Gerda, and Rueda, David (2020). Insuring Against Hunger? Long-Term Political Consequences of Exposure to the Dutch Famine.