

HOUSEHOLD ECONOMIC DECISIONS UNDER THE SHADOW OF TERRORISM

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MOTIVATION

- Terrorism represents a negative shock to future resources (property destruction, loss of asset value, job loss, health consequences)
- Terrorism increases the background risk individuals face. Thus they may want to reduce other kinds of risk exposure (e.g. in their investment choices)
- Prospect theory: people overestimate probability of sustaining a big loss, thus becoming otherwise more conservative in their choices
- Terrorism shortens expected lifetime, thus influencing decisions on retirement and financial planning

LITERATURE

- Numerous studies using macro-level data: negative effect of terrorism incidents on output, investment, tourism
- Abadie and Gardeazabal (1993): negative effect of Basque terrorism on firm performance and valuation
- Becker and Rubinstein (1994): examine labor supply and wages of Israeli workers using aggregate data on terrorist attacks as a proxy for the danger due to terrorism
- Papers in medicine, psychology, political science examine determinants of fear of terrorism, but not economic outcomes

DATA

- Health and Retirement Study: panel survey, representative of the US population of 50+
- Conducted every two years, 15.000 – 20.000 observations
- Modules on demographics, physical and mental health, income and assets, expectations, cognition, social activities
- Three terrorism-related questions in 2002 (context: 9/11, anthrax attacks)

FIRST QUESTION

- “How much -if any- have the events of September 11 shaken your own personal sense of safety and security: have they shaken it a great deal, a good amount, not too much, or not at all?”
- Question about a perceived sense of security on a personal level, allowing for different levels of insecurity
- Distribution: 17% a great deal, 24% a good amount, 42% not too much, 17% not at all

SECOND QUESTION

- “What do you think is the percent chance that there will be a major incident of bio-terrorism in the United States in the next five years, directly affecting 100 people or more?”
- Question about a very specific type of terrorism activity in the US in general. A priori expected to have a small impact on economic decisions
- Distribution: 25th percentile: 50%, 50th percentile: 60%, 75th percentile: 80%

THIRD QUESTION

- “What do you think is the percent chance that you, yourself will be a victim of bioterrorism in the next five years?”
- Question on a personal level about a specific type of terrorism activity. Expected to have a higher impact than the second question.
- Distribution: 25th percentile: 0%, 50th percentile: 10%, 75th percentile: 30%

EMPIRICAL MODEL

- Correlate the three terrorism-related variables to:
 - Age (also cohort since cross-section), Race and Gender
 - Education, Working and Marital Status
 - Physical and Mental Health
 - Income and Wealth Quartiles
 - Cognition (Recall and Numeracy)
 - Religion (Importance and Denominations)
 - Social Activities
 - Veteran Status
 - Regions
 - Months since 9/11

ECONOMETRIC ISSUES

- Linearity of expectations specifications implausible. Use Papke-Wooldridge (1996) fractional variable specification. Weaker effects than linear specification
- Ordered probit specification for personal sense of security
- Possible endogeneity of importance of religion and depression. Instrumenting is very difficult in fractional variable models. We use lagged values instead and results don't change.

Variable	Personal Sense of Security				Expectation of a Bioterrorist Attack in the US		Expectation to Become a Victim of a Bioterrorist Attack	
	Not at all insecure		Very insecure		Marg. Eff.	Std. Error	Marg. Eff.	Std. Error
	Marg. Eff.	Std. Error	Marg. Eff.	Std. Error				
Female	-0.104	0.007 ***	0.095	0.006 ***	0.010	0.007	0.071	0.005 ***
Depressed	-0.056	0.006 ***	0.063	0.007 ***	0.039	0.007 ***	0.024	0.006 ***
Visits neighbours	-0.030	0.005 ***	0.027	0.005 ***	-0.016	0.006 ***	-0.001	0.004
High Tech	0.018	0.005 ***	-0.017	0.005 ***	0.008	0.006	-0.005	0.004
Religion Very Important	-0.037	0.005 ***	0.034	0.005 ***	0.015	0.005 ***	0.029	0.004 ***
Veteran	0.014	0.007 *	-0.013	0.007 *	0.026	0.008 ***	-0.005	0.006
African American	-0.054	0.007 ***	0.063	0.009 ***	-0.080	0.009 ***	0.011	0.007
Other Race	-0.012	0.014	0.012	0.014	-0.039	0.014 ***	0.025	0.013 *
High School Graduate	0.014	0.006 **	-0.015	0.007 **	0.019	0.007 ***	0.000	0.006
College Graduate	0.050	0.008 ***	-0.046	0.008 ***	0.007	0.010	-0.013	0.007 *
2nd Income Quartile	-0.006	0.008	0.006	0.007	0.022	0.009 **	0.009	0.006
3^d Income Quartile	0.002	0.008	-0.002	0.008	0.043	0.009 ***	0.011	0.007
4th Income Quartile	-0.002	0.009	0.002	0.009	0.044	0.011 ***	0.001	0.008

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	Not at all insecure			Very insecure								
	Marg. Eff.	Std. Error		Marg. Eff.	Std. Error		Marg. Eff.	Std. Error	Marg. Eff.	Std. Error		
Middle Atlantic	0.001	0.011		-0.002	0.013		-0.051	0.013	***	-0.002	0.010	
South Atlantic	0.013	0.011		-0.015	0.012		-0.035	0.013	***	-0.023	0.010	**
East North Central	0.036	0.011	***	-0.038	0.012	***	-0.037	0.013	***	-0.027	0.011	***
East South Central	0.005	0.014		-0.006	0.016		-0.051	0.015	***	-0.004	0.013	
West North Central	0.041	0.012	***	-0.041	0.013	***	-0.047	0.014	***	-0.034	0.011	***
West South Central	0.027	0.012	**	-0.028	0.013	**	-0.024	0.014	*	-0.027	0.011	**
Mountain	0.059	0.014	***	-0.056	0.013	***	-0.016	0.015		-0.040	0.011	***
Pacific	0.044	0.012	***	-0.044	0.013	***	-0.055	0.014	***	-0.041	0.010	***
Protestant	0.001	0.026		-0.003	0.025		0.020	0.026		-0.011	0.020	
Jewish	-0.090	0.028	***	0.122	0.032	***	0.009	0.032		0.050	0.024	**
Catholic	-0.022	0.026		0.020	0.025		-0.012	0.026		-0.009	0.021	
No religious preference	0.039	0.028		-0.034	0.026		0.029	0.028		-0.010	0.022	
Number of ADL's	-0.001	0.003		0.001	0.003		0.009	0.004	**	0.003	0.003	
Word Recall Score	-0.003	0.001	**	0.003	0.001	**	0.005	0.002	***	0.001	0.001	
Number Substraction Score	0.006	0.001	***	-0.006	0.001	***	0.000	0.002		-0.003	0.001	**
Months after 9/11 (log)	0.003	0.001	**	-0.003	0.001	**	-0.003	0.001	**	-0.001	0.001	
Number of observations				15,289			14,206			13,962		

IMPACT ON ECONOMIC DECISIONS AND ATTITUDES

- Ownership of stocks, bonds and business
- Expenditure on non-durables
- All analyses performed using a rich set of covariates, thus giving conservative estimates of the effect of terror-related variables

ASSETS

Asset	Gender	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
		Insecure		General Expectation of a Bioterrorist Attack		Expectation to become a victim of a bioterrorist attack		Insecure		General Expectation of a Bioterrorist Attack		Expectation to become a victim of a bioterrorist attack	
		M. Eff.	Std. Error	M. Eff.	Std. Error	M. Eff.	Std. Error	M. Eff.	Std. Error	M. Eff.	Std. Error	M. Eff.	Std. Error
Panel A. By Family Kind													
Couples						Singles							
Shares	Male	0.051	0.031		0.008 0.004 **	-0.001	0.006	-0.073	0.059	0.003	0.008	-0.009	0.010
	Female	-0.073	0.028 ***		0.007 0.004 *	0.004	0.005	-0.033	0.035	-0.006	0.005	-0.011	0.006 *
Bonds	Male	0.067	0.033 **		-0.002 0.004	-0.001	0.006	-0.035	0.066	0.001	0.008	-0.004	0.010
	Female	-0.011	0.028		0.007 0.004 *	-0.003	0.005	0.001	0.034	-0.002	0.005	-0.003	0.006
Own Business	Male	0.016	0.031		0.005 0.003	0.001	0.006	-0.095	0.017 ***	-0.002	0.005	-0.005	0.008
	Female	-0.016	0.023		-0.004 0.003	0.000	0.004	-0.003	0.018	0.001	0.003	0.005	0.004
Panel B. Individuals													
Life Insurance	Male	-0.026	0.024		0.008 0.003 ***	0.003	0.004						
	Female	0.033	0.017 **		0.004 0.003	0.001	0.003						

EXPENDITURE ON NON-DURABLES

- Consumption and Activities Mail Survey (supplemental)
- Quadratic Almost Ideal Demand System (Banks, Blundell and Lewbel, 1996)
- Expenditure Share = $f(\text{Total Expenditure}, \text{Total Expenditure squared}, \text{characteristics})$. Instrument total expenditure with income
- Use Papke – Wooldridge fractional variable framework. Linear specification results in much larger estimates

Item	Gender of Partner	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
		Median Share	Insecure		General Expectation of a Bioterrorist Attack		Expectation to become a victim of a bioterrorist attack		
			M. Eff.	Std. Error	M. Eff.	Std. Error	M. Eff.	Std. Error	
Couples									
Food at Home	Male	0.0784	0.0001	0.0142	0.0006	0.0018	-0.0053	0.0038	
	Female		0.0043	0.0144	0.0022	0.0016	0.0028	0.0024	
Clothing	Male	0.0218	0.0019	0.0050	-0.0008	0.0004 *	-0.0005	0.0010	
	Female		0.0034	0.0036	0.0000	0.0005	-0.0002	0.0006	
Personal Care	Male	0.0131	-0.0004	0.0019	-0.0002	0.0002	0.0004	0.0004	
	Female		0.0041	0.0016 ***	0.0000	0.0002	-0.0006	0.0002 ***	
Recreation	Male	0.0571	-0.0004	0.0087	-0.0023	0.0009 ***	0.0015	0.0019	
	Female		-0.0049	0.0067	-0.0018	0.0010 *	-0.0037	0.0013 ***	
Medical Expenses	Male	0.1218	-0.0176	0.0115	-0.0002	0.0012	-0.0016	0.0026	
	Female		0.0128	0.0111	0.0020	0.0014	0.0003	0.0018	
Housing Expenses	Male	0.0616	-0.0045	0.0129	0.0002	0.0011	0.0020	0.0024	
	Female		0.0281	0.0113 ***	-0.0010	0.0014	-0.0006	0.0016	
Vehicle Costs	Male	0.1061	0.0248	0.0110 **	0.0022	0.0009 ***	0.0020	0.0018	
	Female		-0.0047	0.0070	0.0022	0.0008 ***	0.0019	0.0012	
Utilities	Male	0.1232	-0.0213	0.0115 *	-0.0024	0.0016	-0.0060	0.0034 *	
	Female		-0.0085	0.0122	-0.0023	0.0016	0.0012	0.0020	

FURTHER ISSUES

- Unobserved heterogeneity: fear of terrorism correlated with a propensity to worry, be pessimistic in general
- Positive effects of fear of terrorism on expectations of appreciation of mutual funds during the next year. However this shows that people who worry more about terrorism do not have a generalized pessimistic view about all issues.
- Instrument: religious importance. Preliminary results: no endogeneity problem

CONCLUSIONS

- There are general and personal dimensions to fear of and insecurity due to terrorism. For the former education, sophistication, cognition and economic resources have a positive effect, while for the latter a negative one
- Females are significantly more affected by terrorism, and it is mostly through them that fear of terrorism affects economic decisions for couples. The Jewish, the very religious and the depressed also exhibit increased fear
- Time distance from 9/11 results in diminished sense of insecurity

- For investment in stocks and own business, there is a strong negative effect of the loss of personal sense of security
- No overall effect on consumption of non-durables, but strong indications of spending shifts across items that help dealing with the consequences of terrorism
- The general expectation about a terrorism incident in the US matters very little in general
- Need more data (panel, all age groups, other countries) to establish the robustness of the effects