CONTEMPORARY ECONOMIC POLICY

DO PSYCHOLOGICAL SHOCKS AFFECT FINANCIAL RISK TAKING BEHAVIOR? A STUDY OF U.S. VETERANS

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Traditional economic theories assume that individuals are endowed with certain risk preferences that are unaltered by experiences. However, recent evidence indicates that macroeconomic shocks do have an effect on an individual's willingness to take financial risks. In the context of investment decisions, we examine empirically whether an individual's risk preferences are affected by other types of traumatic life experiences. Using a unique proprietary data set, we investigate whether personal traumatic experiences—such as the combat experiences of veterans—have long-term effects on financial risk-taking behavior. We find that having experienced combat decreases the probability of investing in risky assets. Key policy implications are noted. (*JEL* G11, D14)

I. INTRODUCTION

I don't think anyone can really describe it. It's the same for everybody. I mean, American, British, you know, or any countries . . . it changes you.
Prince Harry on being in combat (June 2009)

Experiencing a psychological shock such as a war or natural disaster has been associated with significant long-term psychiatric morbidity and has been shown to influence a variety of human behaviors (Deahl et al. 2000; McFarlane 1986). Blattman and Annan (2010) show that psychological distress is evident among those exposed to severe war violence and find persistent economic impacts of military service on both skilled employment and earnings. An increasing body of literature shows that mental health issues affect investment behavior. Bogan and Fertig (forthcoming) show that mental health issues decrease the probability of an individual investing in risky assets. Further, Christelis, Jappelli, and Padula (2010) show that cognitive issues are associated with a decrease in risky asset investment and an increase in safe asset investment.

Generally individual investment decisions, specifically stock market participation decisions, have been shown to be influenced by many different factors. Stock market participation is strongly increasing in wealth, increasing in household education, sensitive to transaction costs (Bogan 2008; Bertaut and Haliassos 1997; Haliassos and Bertaut 1995), and influenced by neighbor and peer effects (Brown et al. 2008; Hong, Kubik, and Stein 2004). Simulations of a calibrated life-cycle model, described in detail by Bertaut and Haliassos (1997), show that participation costs are affected by level of education, the degree of risk aversion, labor income risk, and bequest motives. Behavioral factors also have been empirically identified as having an impact on stockholding decisions (Barber and Odean 2001). Nonetheless, much of the cross-sectional variation in portfolio behavior has not been explained in the empirical finance literature on portfolio choice.

With regard to investment decisions, traditional economic theories assume that individuals are endowed with certain risk preferences that

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ABBREVIATIONS

CDC: Centers for Disease Control and Prevention
CDs: Certificate of Deposits
IRAs: Individual Retirement Accounts
WWII: World War II

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are unaltered by experiences. However, recent evidence indicates that experiencing certain types of shocks can have an effect on an individual's risk preferences. For instance, Malmendier and Nagel (2011) show that experiencing macroeconomic shocks affects an individual's willingness to take financial risks and invest in certain types of assets. In the context of investment decisions, whether an individual's risk preferences are affected by other traumatic life experiences that are not directly connected to the financial sector, is an open question.[1]

We exploit a unique data set to help us understand how traumatic experiences affect stockholding behavior. Given the extreme psychological impact of combat, we utilize a sample of veterans to determine if traumatic experiences (combat experiences) influence the probability of investing in risky financial assets. While the combat experience of veterans frequently is utilized to understand leadership behavior (Wansink, Payne, and Ittersum 2008), more recently combat experience has been shown to shape other behaviors and preferences (Wansink, Ittersum, and Werle 2009). We utilize combat experience as a proxy for all traumatic experiences to understand how they affect investment behavior.

After controlling for physical health issues and other respondent characteristics that have previously been shown to influence asset market participation, we find that combat is associated with a decrease of between 0.1410 and 0.1764 in the probability of veterans holding risky assets (stock and mutual funds) and find no significant correlation between combat experience and the probability of veterans holding safe assets. Given that portfolio choices of stock historically have been critical to economic advancement and wealth building, combat could influence veteran preferences for financial risk taking in a suboptimal manner. Hence, this suggests that the combat experiences of veterans are important to consider with regard to determining and managing veteran benefits. More generally, as our results cannot be explained as a response to a shock that provides increased economic/financial information, our paper also provides insights into how traumatic life experiences can bias financial decision-making behavior.

1. One reason this has not been previously explored is because traumatic life experiences are often idiosyncratic. Whether it be an accident, divorce, crime, or natural disaster, data bases are not available to track seemingly idiosyncratic behavior after such tragedies. One exception to this might be the combat violence one experiences in wartime.

II. DATA

A. Overview

Our study utilizes data from the 2000 University of Illinois Veteran Survey. In the year 2000, two waves of surveys were used to gather information on U.S. veterans.[2] Wave 1 collected a random sample of 500 veteran respondents born before 1928. Wave 2 collected a random sample of 250 veteran respondents. In the second wave, post World War II (WWII) veterans were solicited in addition to WWII veterans. Respondents were asked to complete a questionnaire about their experiences before, during, and after war. Most importantly for our purposes, the survey contained questions about military experience, asset holdings, and demographic characteristics. Using the respondent address information provided, the survey data were then merged with 2000 census data to obtain the median income level and median home value for the neighborhood of each respondent (using zip code and census tract information). These neighborhood median income levels and median home levels were used as proxies for wealth and income for each respondent. After the income and wealth data were added, the full sample contained 467 veterans.

B. Summary Statistics

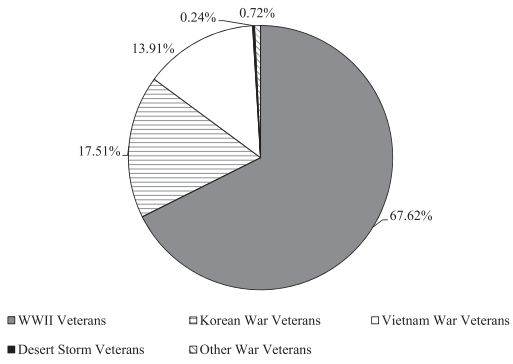
Figures 1 and 2 and Tables 1 and 2 provide summary statistics of our sample of veterans. A detailed description of each variable is available in the Appendix. From Figure 1, we see that the majority of the sample (over 67%) contains veterans that served during WWII.[3,4] Additional summary statistics for the variables used in our analysis are presented in Table 1. From Table 1,

2. To solicit respondents, a random sample of veteran addresses was obtained from census data. In both waves, each veteran was sent a survey, a cover letter, and a business reply return envelope. The cover letter asked each respondent to complete the survey. In return, a small donation was made in their name to the World War II (WWII) Memorial and they were invited to a symposium that discussed the results of the survey.

3. The war service categories are mutually exclusive. If a respondent participated in multiple wars, he is classified according to last war service.

4. The distribution of our sample is consistent with the general distribution of men and women who served in those wars. A total of 33,354,898 men and women served during WWII, the Korean War, the Vietnam War, and the Gulf War; 16,112,566 (48.3%) served in WWII, 5,720,000 (17.1%) served in the Korean War, 9,200,000 (27.6%) served in the Vietnam War, and 2,322,332 (7.0%) served during the Gulf War. Source: www.homeofheroes.com.

FIGURE 1
Respondent War Service Breakdown



Note: Respondents classified according to last war service, if participated in more than one war. Categories are mutually exclusive.

one sees that 22.06% of the sample served in more than one war and 62.59% of the sample experienced combat during their war service.

When studying portfolio choice, a common strategy is to collapse financial assets into classes based upon risk. Consistent with Rosen and Wu (2004), we will focus on "safer" assets (savings and checking accounts, money market funds, certificates of deposit (CDs) and bonds), and "risky" assets (shares of stock in publicly held corporations or mutual funds, not including assets in individual retirement accounts (IRAs), Keogh accounts, 401Ks, or similar defined contribution pension plans). With regard to investment behavior, 76.02% of the sample held safe assets and 40.05% of the respondents held risky assets. Figure 2 illustrates investments by asset class for the combat and noncombat veterans and shows that the largest differences in asset holdings are for riskier asset classes.

While Table 1 presents the general means and standard deviations of the full sample, the combat veteran sample, and the noncombat veterans sample, Table 2 compares the key variable means between the combat and noncombat veteran samples. The last column of Table 2 shows the p values from difference in means tests between key variables in the combat and noncombat subsamples. In these raw statistics, we see a large and statistically significant difference in risky asset holding levels between the two types of veterans (p value of .0006). A much lower percent of combat veterans hold risky assets. We also find statistically significant differences in the health variable and some of the education level dummy variables. However, there is no statistically significant difference in safe asset holdings between combat and noncombat veterans.

III. ECONOMETRIC ANALYSIS AND RESULTS

A. Empirical Framework

This paper posits that traumatic experiences, specifically combat experiences, may affect veterans' financial decisions. Traumatic life experiences, similar to the effect of experiencing macroeconomic shocks, could decrease the probability of investing in risky assets. Alternatively, one could conjecture that significant experiences with very risky scenarios could

FIGURE 2
Respondent Investments by Category: Combat versus Noncombat Veterans

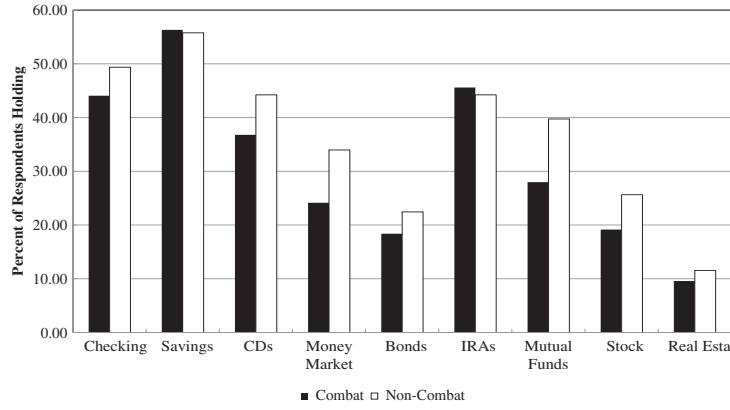


TABLE 1
Key Variables Used in Analysis—Summary Statistics

	Full Sample		Combat Vets		Noncombat Vets	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Finance-related variables						
Percent holding risky assets	40.05	49.06	34.10	47.50	50.00	50.16
Percent holding safe assets	76.02	42.75	74.71	43.55	78.21	41.42
Median income	48,528	17,296	48,532	17,464	48,523	17,067
Median home value	123,490	68,964	120,479	63,656	128,528	76,985
Percent with company pensions	71.94	44.98	73.18	44.39	69.87	46.03
Traumatic experience						
Percent with combat experience	62.59	48.45	—	—	—	—
Served in more than one war	22.06	41.52	25.29	43.55	16.67	37.39
Percent who suffered during depression era	39.54	51.04	38.78	51.18	40.85	50.67
Military service						
Served in the army	46.76	49.96	47.13	50.01	46.15	50.01
Served in the navy	29.74	45.76	31.42	46.51	26.92	44.50
Served in the marines	6.24	24.21	8.43	27.84	2.56	15.86
Served in the air force	22.06	41.52	18.77	39.13	27.56	44.83
Commissioned officer	18.94	39.23	18.01	38.50	20.51	40.51
Demographics						
Average age	75.88	6.81	76.05	6.58	75.61	7.20
Percent male	97.12	16.74	99.62	6.19	92.95	25.68
Percent married	99.04	9.76	99.62	6.19	98.08	13.78
Average number of years married to first spouse	40.83	18.01	41.65	17.84	39.47	18.27
Socioeconomic status						
Percent with some high school	8.63	28.12	10.73	31.01	5.13	22.13
Percent high school graduates	22.54	41.83	22.61	41.91	22.44	41.85
Percent with some college	29.74	45.76	27.59	44.78	33.33	47.29
Percent college graduates	17.75	38.25	14.94	35.72	22.44	41.85
Percent who went to graduate school	20.62	40.51	22.99	42.16	16.67	37.39
Percent managerial/professional occupation	31.17	46.38	29.50	45.69	33.97	47.51
Percent in good health	61.15	48.80	57.85	49.47	66.67	47.29
Average number of times play lottery per month	3.25	5.88	3.32	5.90	3.13	5.88
Observations	417		261		156	

Note: Education categories are mutually exclusive.

TABLE 2
Difference in Means for Key Variables: Combat versus Noncombat Veterans

	Combat Veterans	Noncombat Veterans	*p* Value
Percent holding risky assets	34.10	50.00	.0006
Percent holding safe assets	74.71	78.21	.2101
Percent with some high school	10.73	5.13	.0245
Percent high school graduates	22.61	22.44	.4841
Percent with some college	27.59	33.33	.1075
Percent college graduates	14.94	22.44	.0264
Percent who went to graduate school	22.99	16.67	.0616
Percent in managerial/professional occupation	29.50	33.97	.1706
Percent in good health	57.85	66.67	.0372

desensitize a person to risk and thus make veterans more likely to invest in risky assets. In either case, one should expect veterans with combat experience will hold different portfolios than veterans without combat experience. We examine this empirical question in our analysis below. To understand the extensive margin of asset market participation, we utilize probit models which are similar to those used by Bogan (2008).

In the first model specification, the dependent variable is a binary variable for stock market participation (stocks or mutual funds). In the second model specification, the dependent variable is a binary variable for whether the respondent holds safe assets (savings accounts, checking accounts, certificates of deposit, money market funds, or bonds). The independent variables include respondent characteristic control variables that have been previously identified as influencing investment behavior (Bertaut 1998; Bogan 2008; Rosen and Wu 2994). Specifically we use the following independent variables: an age variable, a male dummy variable, level of education dummy variables, a marriage dummy variable, a years of marriage to first spouse variable, a managerial/professional occupation dummy variable, company pension participation dummy variable, a good health dummy variable, a proxy for general risk behavior, an income proxy, and a wealth proxy.

The education and occupation type serve to control for aspects of a respondent's occupation or training that could lead to increased stock market participation. We use lottery playing as a proxy for risk-seeking behavior. However, as shown by Clotfelter and Cook (1990) and Friedman and Savage (1948), this is a very noisy measure. Thus, we perform our analysis with and without the inclusion of this variable. As Edwards (2008) shows, health risks can also influence portfolio choice. As combat could result in increased health risks, we also control for health issues. We create a "good health" dummy variable that is given a value of 1 if the respondent visited a physician six or fewer times in the past year and is set to 0 otherwise.[5]

Given the unique nature of our sample, we also need to control for specific types of military experiences and having experienced the Great Depression. Thus, we include a dummy variable for whether the respondent was an officer in the military, a dummy variable for military branch of respondent, a dummy variable for participating in multiple wars, and dummy variables for each war served. These war dummy variables control for any war specific draft, enlistment, or combat assignment practices that could influence the results. Moreover, we also control for total number of inductees in the year that the respondent was inducted. We include this variable to account for the fact that combat assignments may be influenced by the total number of military personnel available (total number of inductees).[6] Notably, we also include a proxy for experiencing an economic shock (suffered during the Great Depression dummy variable), as Malmendier and Nagel (2011) show that macroeconomic shocks do have an effect on an individual's willingness to invest in certain types of assets. A detailed description of all of the variables used and how they are constructed can be found in the Appendix.

The general model specification is:

$$(1) \qquad OWNASSET_i = \beta_0 + \sum_{j=1}^{J} \beta_j X_{iJ} + \epsilon_i$$

where X_{ik} is the set of respondent characteristic control variables.

B. Results

Table 3 presents the results of Equation (1) for both risky asset holding and safe asset holding. We see from Table 3 that combat is associated with a 0.1724–0.1764 decrease in the probability of holding risky assets and is significant at the 1% level. From Table 3, one can see that this combat effect on stockholding is very large in magnitude when compared to the effects of education on stockholding. Combat experience decreases stockholding by over 17% while the difference in stockholding between college graduates and individuals that have also attended graduate school is between 7% and 10%.

There is not a similar correlation between combat experience and the probability of holding safe assets. Given the "all veteran" nature of our sample, this difference between risky and safe asset holding and the effect of combat provides compelling evidence of a relationship between

5. We use this as a benchmark because the Centers for Disease Control and Prevention (CDC) reports that on average individuals aged 45 years and older visited the doctor approximately five times per year in 2001. Source: http://www.medscape.com/.

6. Total number of inductees is positively correlated with combat service (0.0350) and combat frequency (0.0745).

TABLE 3
Asset Holding Probit Models—Marginal Effects

	Risky Asset Holding			Safe Asset Holding		
Experienced combat	−0.1758***	−0.1764***	−0.1724***	−0.0567	−0.0742	−0.0652
	(0.0550)	(0.0576)	(0.0637)	(0.0450)	(0.0462)	(0.0497)
Served in multiple wars	0.0569	0.0969	0.1350	0.2008	0.2586	0.2265
	(0.2195)	(0.2311)	(0.2419)	(0.1312)	(0.1176)	(0.1244)
Log of total number of inductees during year inducted	−0.0100	−0.0024	−0.0012	0.0031	0.0070	0.0122
	(0.0093)	(0.0101)	(0.0112)	(0.0077)	(0.0081)	(0.0084)
Commissioned officer	0.0638	0.0652	0.0793	−0.0273	−0.0457	−0.0305
	(0.0750)	(0.0774)	(0.0868)	(0.0664)	(0.0710)	(0.0777)
Age	0.0015	0.0004	0.0008	0.0065	0.0071	0.0034
	(0.0075)	(0.0077)	(0.0083)	(0.0079)	(0.0074)	(0.0076)
Married dummy variable	−0.1023	−0.2955	−0.2567	−0.0438		
	(0.2680)	(0.2920)	(0.3080)	(0.1958)		
Years married to first spouse	0.0032**	0.0038**	0.0036**	0.0033***	0.0039***	0.0038***
	(0.0016)	(0.0017)	(0.0018)	(0.0012)	(0.0013)	(0.0014)
Male dummy variable	0.0331	−0.0282	−0.0723	0.1028	0.0327	−0.0994
	(0.1508)	(0.1636)	(0.1924)	(0.1496)	(0.1414)	(0.1143)
High school graduate dummy variable	0.1924*	0.2030	0.2149*	−0.0076	−0.0279	0.0160
	(0.1171)	(0.1260)	(0.1318)	(0.0814)	(0.0893)	(0.0875)
Some college dummy variable	0.2071*	0.2285*	0.1774	0.0493	0.0284	0.0663
	(0.1145)	(0.1223)	(0.1319)	(0.0771)	(0.0837)	(0.0829)
College graduate dummy variable	0.3164***	0.3323***	0.3111**	0.0116	0.0010	−0.0164
	(0.1166)	(0.1239)	(0.1337)	(0.0870)	(0.0937)	(0.0999)
Went to graduate school dummy variable	0.3979***	0.4077***	0.4144***	0.1073	0.0837	0.0811
	(0.1083)	(0.1153)	(0.1218)	(0.0728)	(0.0808)	(0.0823)
Managerial/professional occupation dummy variable	−0.0198	−0.0271	−0.0029	0.0682	0.0551	0.1069
	(0.0549)	(0.0566)	(0.0626)	(0.0441)	(0.0459)	(0.0469)
Has company pension dummy variable	−0.0773	−0.0837	−0.0868	0.0400	0.0458	0.0390
	(0.0581)	(0.0608)	(0.0680)	(0.0493)	(0.0522)	(0.0572)
Good health dummy variable	−0.0363	−0.0410	−0.0352	−0.0833*	−0.0711	−0.0733
	(0.0537)	(0.0555)	(0.0606)	(0.0429)	(0.0453)	(0.0482)
Income and wealth controls	Yes	Yes	Yes	Yes	Yes	Yes
Wars served and military branch dummy variables	Yes	Yes	Yes	Yes	Yes	Yes
Risk behavior control	No	No	Yes	No	No	Yes
Economic shock control	No	Yes	Yes	No	Yes	Yes
Observations	417	387	320	417	384	317
Log likelihood	−250.50	−231.69	−191.82	−213.99	−193.70	−152.38

Note: Standard errors in parentheses.
*Significant at 10%; **significant at 5%; ***significant at 1%.

the traumatic experience of combat and financial risk-taking preferences.

With regard to the other independent variables, we find that the number of years married to first spouse is associated with an increase in both risky and safe asset holding and is significant in both specifications. While not the focus of this paper, this result is consistent with Sunden and Surette (1998) who find that investment decisions are driven by marital status. Also, consistent with the stockholding behavior literature, both the college graduate dummy variable and the graduate school dummy variable are correlated with an increase in risky asset holding ($p < .01$).

Table 4 presents results of Equation (1) for probit regressions in which the dependent variable represents only one type of asset (stocks, mutual funds, bonds, savings accounts, or checking accounts).[7] From Table 4 we see

7. We present the results from the specifications that do not include the risk and economic shock controls for two reasons: (1) the marginal effects are more conservative and (2) as discussed previously, the measures are noisy. However, the specifications that do include these measures produce results consistent with those presented in Table 4.

TABLE 4
Asset Holding Probit Model by Individual Asset Type—Marginal Effects

	Risky Asset Holding		Safe Asset Holding		
	Stock	**Mutual Funds**	**Bonds**	**Savings Accts**	**Checking Accts**
Experienced combat	−0.0734*	−0.1369***	−0.0545	−0.0197	−0.0635
	(0.0453)	(0.0527)	(0.0444)	(0.0546)	(0.0550)
Served in multiple wars	0.3727	−0.1674	0.2199	−0.0191	0.3325
	(0.2130)	(0.1659)	(0.2086)	(0.2148)	(0.1944)
Log of total number of inductees during year inducted	−0.0003	−0.0173**	−0.0036	−0.0024	0.0073
	(0.0077)	(0.0086)	(0.0070)	(0.0095)	(0.0094)
Commissioned officer	−0.0201	0.0553	−0.0149	−0.0452	−0.1646
	(0.0539)	(0.0706)	(0.0530)	(0.0749)	(0.0698)
Age	0.0082	−0.0027	0.0117**	0.0089	0.0140*
	(0.0059)	(0.0071)	(0.0057)	(0.0074)	(0.0074)
Married dummy variable	−0.0102	0.0028		−0.3241	−0.3511
	(0.2059)	(0.2593)		(0.1448)	(0.2038)
Years married to first spouse	0.0006	0.0040***	0.0019	0.0042***	0.0015
	(0.0013)	(0.0015)	(0.0013)	(0.0015)	(0.0015)
Male dummy variable	0.0484	−0.0079	−0.0535	−0.0137	−0.0494
	(0.1063)	(0.1495)	(0.1394)	(0.1616)	(0.1596)
High school graduate dummy variable	0.0034	0.1835	−0.1331*	−0.0694	−0.0095
	(0.0963)	(0.1215)	(0.0566)	(0.1010)	(0.0989)
Some college dummy variable	0.0616	0.2173*	−0.0642	0.0284	−0.0114
	(0.0984)	(0.1170)	(0.0691)	(0.0992)	(0.0986)
College graduate dummy variable	0.1970*	0.2677**	0.0441	0.0015	0.0891
	(0.1232)	(0.1288)	(0.0879)	(0.1081)	(0.1081)
Went to graduate school dummy variable	0.2437**	0.3725***	0.0503	−0.0050	0.1424
	(0.1227)	(0.1215)	(0.0885)	(0.1068)	(0.1054)
Managerial/professional occupation dummy variable	−0.0144	−0.0371	0.0099	0.0158	0.0574
	(0.0433)	(0.0508)	(0.0422)	(0.0551)	(0.0556)
Has company pension dummy variable	−0.0472	−0.0544	0.0825*	0.1359**	0.0652
	(0.0481)	(0.0552)	(0.0400)	(0.0571)	(0.0567)
Good health dummy variable	−0.0842**	0.0333	−0.0345	−0.1068	−0.0868
	(0.0443)	(0.0500)	(0.0421)	(0.0522)	(0.0532)
Income and wealth controls	Yes	Yes	Yes	Yes	Yes
Wars served and military branch dummy variables	Yes	Yes	Yes	Yes	Yes
Risk behavior and economic shock controls	No	No	No	No	No
Observations	417	417	413	417	417
Log likelihood	−190.59	−235.82	−181.43	271.91	−274.45

Note: Standard errors in parentheses.
*Significant at 10%; **significant at 5%; ***significant at 1%.

that combat is associated with a statistically significant decrease in the probability of holding risky assets (p value of .097 for stock holding and p value of .009 for mutual fund holding). Notably, the magnitude of the stockholding effect is much smaller than for mutual funds. Our conjecture is that this may be because of other effects like information effects. Alexander, Jones, and Nigro (1998) note the individual investor challenges in understanding the costs and risk associated with mutual fund investment because of insufficient regulatory and disclosure requirements. Correspondingly, understanding the composition, cost, and risks of mutual funds may be more difficult if one has cognitive limitations because of psychological trauma/stress. Table 4 also shows that combat is not associated with a statistically significant change in holding bonds, savings accounts, or checking accounts.

C. Evidence of a Causal Relationship

For two of the three major war veteran groups that are represented in our sample (Korea

TABLE 5
Risky Asset Holding Probit Models—World War II Only Veterans Subsample

	WWII Veterans		
Experienced combat	−0.1453**	−0.1410**	−0.1562**
	(0.0677)	(0.0691)	(0.0770)
Log of total number of inductees during year inducted	−0.0080	0.0015	−0.0046
	(0.0127)	(0.0144)	(0.0157)
Commissioned officer	0.0972	0.1143	0.1334
	(0.0931)	(0.0956)	(0.1106)
Age	0.0015	−0.0056	−0.0033
	(0.0110)	(0.0115)	(0.0124)
Married dummy variable	0.0523	−0.1348	−0.0980
	(0.2833)	(0.3790)	(0.3776)
Years married to first spouse	0.0026	0.0031	0.0032
	(0.0019)	(0.0020)	(0.0022)
Male dummy variable	0.0125	−0.0345	−0.0645
	(0.1552)	(0.1659)	(0.1953)
High school graduate dummy variable	0.1978	0.1630	0.1874
	(0.1305)	(0.1343)	(0.1414)
Some college dummy variable	0.1360	0.1196	0.0706
	(0.1323)	(0.1346)	(0.1438)
College graduate dummy variable	0.3855***	0.3553***	0.3288**
	(0.1294)	(0.1367)	(0.1473)
Went to graduate school dummy variable	0.3913***	0.3541***	0.3490**
	(0.1279)	(0.1347)	(0.1429)
Managerial/professional occupation dummy variable	−0.0070	−0.0052	0.0024
	(0.0677)	(0.0692)	(0.0771)
Has company pension dummy variable	−0.1601**	−0.1785***	−0.1877**
	(0.0697)	(0.0724)	(0.0825)
Good health dummy variable	−0.0048	−0.0132	0.0133
	(0.0641)	(0.0660)	(0.0725)
Income and wealth controls	Yes	Yes	Yes
Military branch dummy variables	Yes	Yes	Yes
Risk behavior control	No	No	Yes
Economic shock control	No	Yes	Yes
Observations	282	266	217
Log likelihood	165.25	155.28	−127.98

Note: Standard errors in parentheses.
**Significant at 5%; ***significant at 1%.

and Vietnam), there is evidence that combat assignments were not made randomly (Gimbel and Booth 1996; Maclean 2001). However, within the sample of WWII veterans, there is support for the assertion that combat assignments were made randomly (Gimbel and Booth 1996; Jha and Wilkinson 2011). So far, we have established a clear correlation between veteran participation in combat and decreased risky asset holding. However for the subsample of WWII veterans, we can analyze the relationship between combat service and investment behavior. As combat assignments were performed through a random process for WWII veterans, it cannot be the case that unobserved variables associated with combat service are correlated with both investment behavior and combat service. Thus, we can begin to make a case that combat service causes differential investment behavior. Table 5 shows that for the WWII veteran subsample, combat experience significantly decreases the probability that veterans will hold risky assets between 0.1410 and 0.1562 ($p < .04$).

IV. CONCLUSIONS

Historically, portfolio choices of stock have been vital to economic advancement and wealth

FIGURE 3
Average Investment Strategy of High School-Educated Veterans

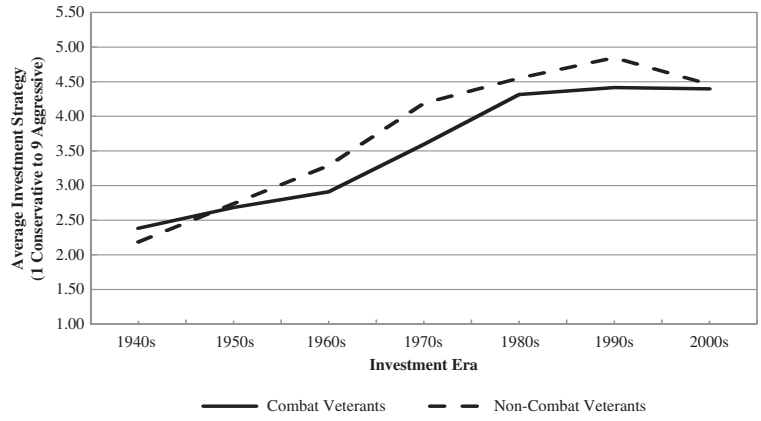
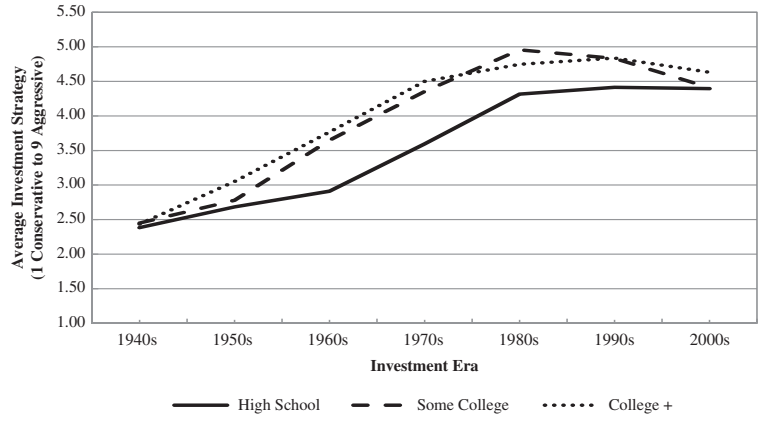


FIGURE 4
Average Investment Strategy by Decade of Combat Veterans



building, particularly during prosperous economic times. Understanding the impact of combat experiences on investment decisions could help us to understand how traumatic experiences affect financial decisions of veterans in particular and provide insights into factors that influence financial decision making in general. We find that combat is associated with a 0.1410 to 0.1764 decrease in the probability of holding risky assets and find no significant correlation between combat experience and the probability of holding safe assets. Hence, in the same way that macroeconomic shocks affect an individual's willingness to take financial risks, psychological shocks affect an individual's willingness to take financial risks. This finding sheds light on another factor which may help to explain the large unexplained portion of cross-sectional variation in portfolio choice: traumatic psychological experiences.

Moreover, our results could have policy implications for determining and managing veterans' benefits programs. Figure 3 shows that high school-educated combat veterans have more conservative investment strategies than noncombat veterans. We also see from Figure 4 that education can influence combat veterans' subjective assessment of their investment strategies. If combat influences the preferences for financial risk taking in a suboptimal manner

such that their investing is significantly different than noncombat veterans (Figure 3), veteran benefits design should take into account veteran combat status. Just as the GI Bill of the 1940s stimulated a new generation of college graduates, current veteran benefits could have an increased focus on college education—especially in the case of those receiving combat pay. In general, however, this suggests that government veteran benefits and education programs can fortify their efforts in investment education, realizing that the default investment strategies may be much more conservative than merited. Indeed, the inclusion of educational support for veterans may be a key to combating any negative financial investing effects experienced by combat veterans.

APPENDIX A. DESCRIPTION OF VARIABLES USED IN ANALYSIS

Demographic, Experience, and Finance-Related Variables Used

- Combat experience dummy variable: A dummy variable that is given a value of 1 if the respondent experienced combat and is set to 0 otherwise.
- Multiple war dummy variable: A dummy variable that is given a value of 1 if the respondent served in more than one war and is set to 0 otherwise.
- Individual war served dummy variables: Dummy variables to control for war service in a specific war (WWII, Korea, and Vietnam). The variable is given a value of 1 if the respondent served during the war and 0 otherwise.
- Log of total number of inductees: The natural log of the total number of military inductees during the year that the respondent was inducted. We include this variable to account for the fact that combat assignments may be influenced by the total number of military personnel available.
- Military branch dummy variables: Dummy variables to control for military branch of respondent (air force, army, marines, and navy). The variable is given a value of 1 if the respondent served in the military branch and 0 otherwise.
- Commissioned officer dummy variable: A dummy variable that is given a value of 1 if the respondent was a commissioned officer in the military and is set to 0 otherwise.
- Suffered during depression era dummy variable: A dummy variable that is given a value of 1 if the respondent answered less than 4 (on a scale of 1–8) that life was good in 1939. The variable is set to 0 otherwise. This variable is used to control for experiencing an economic shock.
- Age: The age of the respondent in 2000.
- Male dummy variable: A dummy variable that is given a value of 1 if the respondent is male and is set to 0 otherwise.
- Married dummy variable: A dummy variable that is given a value of 1 if the respondent is married and is set to 0 otherwise.
- Number of years married to first spouse: The number of years the respondent was married to first spouse.
- Have some high school dummy variable: A dummy variable that is given a value of 1 if the respondent has some high school experience but did not graduate and is set to 0 otherwise.
- High school graduate dummy variable: A dummy variable that is given a value of 1 if the respondent is a high school graduate and is set to 0 otherwise.
- Have some college experience dummy variable: A dummy variable that is given a value of 1 if the respondent has some college experience but is not a college graduate and is set to 0 otherwise.
- College graduate dummy variable: A dummy variable that is given a value of 1 if the respondent is a college graduate and is set to 0 otherwise.
- Went to graduate school dummy variable: A dummy variable that is given a value of 1 if the respondent attended graduate school and is set to 0 otherwise.
- Managerial/professional occupation dummy variable: A dummy variable that is given a value of 1 if the respondent ever worked in a managerial/professional occupation and is set to 0 otherwise.
- Good health dummy variable: A dummy variable that is given a value of 1 if the respondent visited a physician six or fewer times in the past year. The variable is set to 0 otherwise. We use this as a benchmark because the Centers for Disease Control and Prevention (CDC) reports that on average individuals aged 45 years and older visited the doctor 4.7 times per year in 2001.[8]
- Number of times play lottery per month: The number of times per month that the respondent plays the lottery. This variable is used as a proxy to control for risk behavior.
- Have a company pension dummy variable: A dummy variable that is given a value of 1 if the respondent has a company pension and is set to 0 otherwise.
- Income proxy: The natural log of the median 1999 income level for the respondent's given zip code and census tract number.
- Home value proxy: The natural log of the median 1999 home value for the respondent's given zip code and census tract number.
- Holds safe assets dummy variable: A dummy variable that is given a value of 1 if the respondent owns safe assets and is set to 0 otherwise. Safe assets include owning bonds, CDs, money market funds, savings accounts, and checking accounts.
- Holds risky assets dummy variable: A dummy variable that is given a value of 1 if the respondent owns risky assets and is set to 0 otherwise. Risky assets include owning shares of stock in publicly held corporations or mutual funds.

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8. Source: http://www.medscape.com/.

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