

Examining the Impact of Financial Literacy Training on Observed Financial Behavior: Evidence from a Large Scale Natural Experiment

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Researchers in social and medical science have shown that financial well-being is related to psychological and physiological distress. Thus, there has been a keen interest in evaluating impact of financial literacy training (FLT) for individuals on their financial decision making. Past studies faced three empirical challenges, and none to the best of our knowledge has been able to address them.

First, studies based on secondary data cannot cleanly account for endogeneity of an individual's decision to enroll in FLT. *Second*, lab experiment based studies address self-selection issues but use stated behavior or simulated tasks as proxies for financial behavior. The lack of incentive alignment and stated preferences makes for weak generalizability. *Third*, more recently three studies use quasi-natural experiments with field data and naturally occurring exogenous variation in FLT across states to address generalizability and endogeneity challenges. However, since studies use aggregate data they can only provide intent to treat estimates. None of these studies account for the fact that there may be dynamics (e.g. delay, duration, reducing effectiveness of impact etc.) and heterogeneity (e.g. role opportunity, motivation, and ability) in impact of FLT. Our study addresses these gaps by utilizing exogenous variation in FLT, 360 degree observed financial behavior at individual level (thus treatment on treated estimate), and over long time series (thus capture dynamics).

For this study we use a law change (§992 of The Title 10 of US Code) that mandated US Military to provide FLT to all its personnel, but it was implemented in a staggered fashion by each military branch. All personnel of a given branch were mandated to undergo FLT at designated times and no personnel, regardless of rank, could opt out. This creates naturally occurring exogenous variation in the data. The measures on financial outcomes of these personnel come from a large financial services organization, which is the only organization in the US that is legally permitted to sell investment, banking, and insurance products (see Glass-Steagall Act and Volcker Rule). This unique characteristic permits us to observe a 360 degree financial behavior of its customers. Our analyses is based on a balanced panel of 22,372 military personnel over 84 month (Apr-2011 to Dec-2017).

We focus on three financial behaviors of interest: investments, savings, and use of credit. Each is measured as month over month change in sum total of respective account balances adjusted for monthly income level. We use a two-way fixed effect model, which accounts for individual and time specific unobserved heterogeneity. We use flexible time trends to capture dynamics, i.e. permit effectiveness of training to vary from month to month.

We find that over a one year window there is no discernable immediate or delayed effect of FLT. However, heterogeneous levels of opportunities, motivation and abilities across individuals is important determinant of the effectiveness of FLT. An income shock (measured as salary raises or training stipends) provides additional financial *Opportunity*, a life changing event (such as marriage/divorce or new birth/adoption) provides *Motivation*, and heterogeneous numerical literacy (measured as officers vs. enlisted) provides differential *Ability* to implement skills imparted in FLT. We find financially trained individuals are more effective at utilizing income shock by increasing sustained investments and short but delayed bump in savings. We also find that officers, who have higher numerical literacy are more effectively using their training by showing immediate and sustained increase in investments. Unfortunately, despite receiving FLT, enlisted members show poor financial decision making (e.g. no improvement in investments or savings, increase in debt).

Our clean identification strategy and rich individual level data helps us draw important policy implications on effectiveness of FLT. Our study calls for more research on timing for delivering these FLT's and redesigning content for individuals with differential numerical abilities.