The "State" of Behavioral and Demographic Analysis of Longevity Risk: A State-Aggregated Approach to Studying the Inter-Related Effects of Financial Education and Financial Literacy

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Introduction
State-level governments and private institutions have long sought to generate optimal financial outcomes through greater financial education. Various private organizations and policy initiatives have aimed to increase financial education among the population since the early 20th century. An underlying assumption of this relationship is that financial education generates financial literacy that allows consumers to accurately assess financial products and make optimal financial decisions.

In order to support the aforementioned assumption, literature that links financial education to financial literacy and that connects financial literacy to financial outcomes were drawn. In the former line of academic research, studies depict the effects of both targeted financial education and general financial education on financial literacy. In the latter, researchers study how an individual’s financial literacy translates to optimal financial decisions.

This particular study contributes a bird’s eye perspective to the existing literature and seeks to demonstrate that financial education can generate optimal financial decisions by creating an environment of financial awareness within a state. Specifically, the research focused on how increased financial education in high school and college generate more financially-aware populations and more avenues for lifetime financial learning; more educated individuals are more capable of assessing complex financial products.

Furthermore, more financial education likely produces more financial advisors in the state, leading to more opportunities for financial education after formal education. By taking an aggregated view of the process, the spillover effects associated with an increased “financially aware” environment that do not show up in individual-level studies are captured.

Hypothesis
For the purposes of this study, the state level annuity benefit payments were assumed to reflect the efforts of the populations to protect against longevity risk. The decision to annuitize shows some effort, on the individual level, to protect against one’s own longevity risk, so others’ experiences provide limited insight. Furthermore, unlike credit cards and mortgages, individuals do not have the luxury of learning from previous usages. Thus, the aggregate decision of a state population to annuitize was collected to examine how that decision relates to the state level of financial awareness. Based on previous research, a positive correlation was expected between the awareness of financial concepts and the decision to annuitize.

Data and Methodology
Data was collected from several sources. Annuity payments and life insurance benefit payments were hand-collected from the American Council of Life Insurers (ACLI) Fact Books. This data was reported by state yearly from 1950-2013. The annuity payments information was used to construct the key dependent variable, annuity payments per capita, which was adjusted for inflation (figure 4). The variation across states was explored through univariate analyses, ranking the annuities per capita by state and by decade.

In order to measure awareness of financial concepts, two proxies were used. The annuity benefits data was analyzed alongside state-level data on the high school graduation rate ($HStd$) (figure 5), state population, per capita income ($PCIncome$) and the Consumer Price Index (CPI), obtained from the U.S. Census Bureau. Previous literature suggested demand for all forms of insurance increases with education for several reasons, including (1) educated individuals are more likely to understand the risk for which they seek coverage and (2) educated individuals are more likely to understand the insurance products themselves.

The second proxy used was the total state compensation in the financial services sector ($FinSector$), which was compiled from the Bureau of Economic Analysis. Data is available on the total compensation of all non-farm employees from 1960-2013 and compensation in the financial sector, including financial services, real estate and insurance (figure 6). A larger share of state compensation derived from financial services employment suggested not only that a larger share of the population may be employed in financial firms, but also an increased likelihood that the state population is aware of the existence of financial institutions and the products they offer.

The two proxies used for the awareness of financial concepts, $FinSector$ and $HStd$, capture the essence of what is relevant for financial literacy due to the extent in which they vary across state and across time. The correlation between these two proxies and annuity payments per capita is then evaluated using an OLS regression.

Results
First, the ranking of each state’s annuity payments per capital is depicted by a United States map for each decade (figures 1-3). The environment of the education system within a state or the share of the population compensated in financial services could be a factor in explaining why the Northeast states remained high and the Southern states remained low in the rankings.

The preliminary results from the fixed effects OLS regressions of annuity payments per capita on measures of financial awareness of the state showed a positive and significant relationship between financial awareness and the decision to annuitize most models. The regression presented a highly statistically significant coefficient of 0.086 for $FinSector$. This means that a 1% increase in the state share of compensation to employees in the financial sector is associated, on average, with a $66 increase in annuity payments per capita in the state. Furthermore, sixty-two percent of the within state variation (and 43% of the across states variation) in annuity payments per capita can be explained by $FinSector$ and $PCIncome$. This suggested, overall, that the share of a population employed in the financial sector has a significant effect on the state population’s decision to annuitize and, therefore, hedges against longevity risk.

The OLS regression also indicated a coefficient of 0.005 significant at the 1% level. This means that, in a given state, a 1% increase in the percentage of students who obtained a high school degree in a given year is associated with an average increase of 5 dollars in the annuity payments per capita. This coefficient, however, becomes insignificant when the data is controlled for income.

Conclusion
In essence, a more financially-aware population is more likely to invest in protection against longevity risk. This study provides evidence that variations across states and across time in both (1) the share of the population working in financial services, and (2) the high school graduation rate, can explain variations across states and across time in annuity benefit payments per capita. These results confirm that more educated individuals are more capable of assessing complex financial products, and that more financial education likely produces more financial advisors in the state, leading to more opportunities for financial education after formal education.

These research findings are instructive for future development of activities to promote financial literacy across the country, and further work will explore the extent to which other state characteristics intervene. For example, we expect that the unionization of the workforce, the general health of the population, and state regulations pertaining to education and workplace arrangements, may help to further explain variations in populations protecting against longevity risk.