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Financial literacy and numerical ability: Keys to better mortgage outcomes

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FINANCIAL LITERACY AND NUMERICAL ABILITY: KEYS TO BETTER MORTGAGE OUTCOMES

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While mortgage credit expansion had lead to a rapid increase of home ownership in the US, the reversal of home prices beginning in 2006 resulted in a substantial increase in mortgage delinquencies and an explosion in outright defaults. Its devastating impact on the associated mortgage backed securities led the US and the world to its worst financial and macroeconomic crisis since the Great Depression, with its deleterious effects still felt today.

Day to day, large segments of the population make important, complicated financial decisions, such as home purchase and the types of loans to take. Yet, recent research has shown that many people have difficulties answering simple questions concerning basic financial principles. They make systematic financial mistakes, such as underestimating the interest rates from payment streams, said Stephan Meier, an associate professor of management at Columbia University's Graduate School of Business. He was speaking at Singapore Management University's School of Economics Seminar Seriesson the impact of financial literacy on mortgage decisions and outcomes.

His hypothesis stemmed from previous research that had claimed that the rise in mortgage defaults was due to borrowers' limited ability to make complicated financial decisions.

Together with Kristopher Gerardi from the Federal Reserve Bank of Atlanta and Lorenz Goette from the University of Lausanne, Meier's team used a comprehensive dataset of privately securitised subprime mortgages purchased by the Federal Reserve Bank of Boston from Corelogic (previously known as the First American LoanPerformance).

The dataset contained detailed information on the terms and payment history of the mortgages, enabling the researchers to track outcomes. It should be noted that the data used in the research was reported by the mortgage servicers, and not by the borrowers, many of whom were confused about the contractual terms that they had signed up for and could potentially misinterpret their debt and repayment.

This data was supported by survey data from telephone interviews with a sample of the subprime borrowers. Questions measuring crucial aspects of financial literacy such as numerical and

cognitive ability, time and risk preferences and social demographic information were asked. The researchers then created a financial literacy index to rank the borrowers.

The importance of numerical ability

A statistically significant negative correlation was found between financial literacy and measures of mortgage delinquency and default. "20 per cent of the borrowers in the bottom quartile of our financial literacy index have experienced foreclosure, compared to only 5 per cent of those in the top quartile," they wrote. Those in the bottom quartile were also behind on their payments 25 per cent of the time, compared to 10 per cent for the top quartile.

While Meier acknowledged that financial literacy comprised different skills, the results of the survey allowed them to pinpoint the specific aspects important to mortgage outcomes.

Numerical ability, or the ability to perform simple mathematical calculations, was measured by subjecting interviewees to calculations such as figuring out how much items cost in a sale, the use of percentages and simple interest rate computations.

Economic literacy was tested using two questions testing money illusion. The first asked whether one had more buying power after a year if inflation exceeded the interest rate on a savings account, while the second asked whether there was any change to purchasing ability if both income and prices had doubled.

Asking participants to name as many animals as they could think of in 90 seconds tested cognitive ability. Past research had shown a high correlation between the number of animals named and IQ. Serving as an additional measure of cognitive ability, the time taken to answer the numeric ability questions was also recorded.

Among these three abilities, numerical ability was found to have the most significant effect. “The addition of both a verbal IQ measure, the response time and a different aspect of financial literacy, economic proficiency, does not explain differences in mortgage delinquency and default, and does not affect the correlation between the numerical ability index and mortgage delinquency.” Instead, the researchers found an unconditional relationship between numerical ability and delinquency.

Meier suggested that the inability of an individual to perform the simple mathematical calculations necessary to maintain a household budget or to calculate whether monthly mortgage payments were affordable over the long term had an impact on the individual’s decision to default on a mortgage. Other research had also linked poor financial literacy to higher consumption, less savings and an out-of-control credit usage.

Meier added, “An important channel through which financial literacy could affect mortgage delinquency is in leading individuals to obtain mortgages with unfavourable terms, because they may be more likely to make mistakes in assessing the financial consequences of a particular contract.” It was also possible that those with low numerical ability choose mortgage companies that provided poor support for their borrowers.

However, it was noted that experience gained from previous mortgages did not appear to have a strong effect on the extent on delinquency, even though some evidence indicated that first-time buyers of homes were more likely to experience foreclosures.

Socio-economic variables, such as age, gender, ethnicity, education, labour market status, household income and income volatility, were also added to the regression analyses as control variables. The inclusion of these variables did not significantly change the point estimates or standard errors related to numerical ability.

Hence even after conditioning for the individual's labour market outcomes, financial situation at the time of mortgage origination, and other socio-economic variables, there was still a statistically significant and qualitatively unchanged large correlation between numerical ability and subprime mortgage delinquency. "Higher numerical ability may convey many advantages in life, such as better performance and higher productivity in the workplace, and a more successful experience in credit markets," the researchers wrote.

Implications for creditors and borrowers

The research findings could provide insights to lending firms on how they should design contractual terms and manage risks. People with difficulties dealing with numbers would seem riskier. More intensive financial education could also improve borrowers' financial decisions, though more research would be required to demonstrate causal links between financial education and cost-effective impact.

An interesting outcome was that mortgage terms and improved disclosure might not reduce the impact of financial literacy on repayment behaviour. Individuals were often confused about important contractual terms on their mortgage, and those with low cognitive ability often overestimated the value of their homes on home equity loan applications. The confused ones were more likely to have adjustable rate mortgages which experienced higher default rates compared to fixed-rate mortgages during the financial crisis. However, the results of this research showed that numerical ability does not systematically predict riskier mortgage choices.

"Future research has to investigate whether numerical ability and disclosure are substitutes or whether they are more complementary. It is easy to imagine that individuals who cannot perform basic mathematical calculations, like the one in this study, need extremely simple disclosure in order to avoid further confusion," the researchers noted. Meier felt that a logical and important future step in furthering this work would be to extend the model he had used to examine the effects on other household financial decisions, such as personal savings and consumption choices.