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"How important is financial literacy for economic well-being?"

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1 Introduction

Pressure on social security systems, demographic change, increasing complexity of financial products and growing self-responsibility of market participants are expected to have severe consequences on both individual and aggregate economic well-being. Old age poverty, mortgages defaults and foregone returns are only some examples for consequences of common financial mistakes. Current literature suggests that financial literacy is a crucial tool to counteract the above-mentioned unfavorable outcomes. But financial literacy is found to be low across countries irrespective of structural characteristics leaving households unarmed. In this paper we review current literature on how financial literacy can be measured, outline its effect on economic well-being and provide alternatives to financial education. Finally, we will take a brief look at possible future developments and give concluding remarks.

2 Measurement tools

To measure financial literacy, we have two main options: Taking surveys and analysing datasets regarding actual investment behaviour.

2.1 Surveys

In surveys we can either test for actual knowledge or ask for a self-assessment of participants' knowledge. The latter is relevant because the self-assessed knowledge should have an important influence on financial decisions of a household (Rooij, Lusardi & Alessi, 2007). But most people are not aware of their lack of financial literacy (Lusardi & Mitchell, 2014). To avoid lacking representability the questions can be attached to big surveys like PISA or other OECD or country surveys (e.g. SCF of the FED, DNB Household Survey in the Netherlands). It is also important to keep attention to the wording of the questions, because especially with more difficult questions an inverting of the wording significantly changes the answers (Rooij, Lusardi & Alessi, 2007). Actual

knowledge can also be tested by measuring the success of answering questions regarding numeracy and understanding of basic and advanced economic concepts. For example, numeracy is a strong tool to predict mortgage defaults if looking at subprime mortgage holders (Lusardi & Mitchell, 2014). Numeracy is even important if controlled for cognitive ability or education. The understanding of basic economic concepts includes the ability to correctly answer questions regarding inflation, interest rate compounding, diversification and time value of money (Rooij, Lusardi & Alessi, 2007; Lusardi & Mitchell, 2014). The questions regarding more advanced knowledge include questions about different asset classes, the way a stock market works and the relationship between risk and return.

2.2 Actual investment behaviour

To measure financial literacy, one could look at household investment decisions, in particular errors like underdiversification of the household portfolio, paying unnecessarily high transaction costs, fees or mortgages, the disposition effect or even falling for financial scams. Another way is to look at retirement planning activities, which is not only highly correlated with retirement wealth (Lusardi & Mitchell, 2007) but also a good indicator for financial literacy. In the US, a considerable fraction of workers fails to take advantage of the tax arbitrage opportunity provided by their 401(k) plans but those who do have significantly higher retirement wealth (Choi, Laibson & Madrian, 2005). Another way of measuring financial literacy is looking at stock market participation. Stock market participation is increasing in financial literacy (Rooij, Lusardi & Alessi, 2007). Another difficulty with measuring financial literacy is to disentangle the effects of the level of education and wealth on the level of financial literacy. With this data it is possible to design indices to express the level of financial literacy.

2.3 Measurement issues

Besides the wording of questions mentioned before there are some issues measuring financial literacy. The direction of causality is a big problem when measuring financial literacy: A person which is wealthy has a high incentive to obtain a higher level of financial literacy to avoid costly investment mistakes. On the contrary, wealth might have its origin in high levels of financial literacy. In addition, there might be omitted variables while examining actual investment behaviour, like the effect of an individual with high financial literacy on the economic outcome of other economic agents.

3 Group characteristics

Certain characteristics are correlated with financial literacy. In the US, White participants are found to perform better in surveys on financial literacy compared to Blacks or Hispanics. Overall, men do better than women and education has a strong positive correlation with financial literacy (Lusardi & Mitchell, 2007). Less strong but also positive is the correlation with wealth and income. The Life-cycle path of financial literacy is hump shaped. Financial literacy goes up until the early 50's and then gradually goes down. This might explain why the young and the elderly display the lowest level of financial literacy.

Compared to women, men display higher levels of financial literacy irrespective of their level of education. However, men tend to overestimate their actual knowledge while women are much more likely to be aware of their financial shortcomings (Lusardi & Mitchell, 2014).

4 Determinants of financial literacy

Before we study the *effect* of financial literacy on economic well-being, we shed light on its *determinants*. The optimum level of financial knowledge depends on three things: The shape of the financial knowledge acquisition cost curve, effective compensatory mechanisms and the extent of redistributive transfer programs. The latter ensures a minimum income stream for beneficiaries that

fall into poverty. This disincentive crowds out financial literacy (Lusardi & Mitchell, 2014). Recommendations via internet, family or financial advisors – if qualitatively high – justify low effort to acquire financial literacy. A steep cost function reflects high opportunity costs for gathering and processing relevant information, thus crowds out financial literacy. Below, we offer valuable insights regarding the impact of financial illiteracy on economic-wellbeing.

5 Effect of financial literacy on Economic well-being

5.1 Asset side of households

Turning our attention to the *asset* side of the balance sheet, we find that especially poor diversification and non-participation are to blame for inefficiency in the financial portfolio. According to Rooij, Lusardi and Alessie (2011) financial illiteracy is significantly negatively correlated with the probability to participate in risky asset markets. In the wake of non-participation, J.Y. Campbell (2006) constitute an annual return loss of 2.3%. This estimation assumes that non-participants would lack diversification, if they did participate. However, underdiversification makes a difference of 0.5% of average disposable income (Calvet, Campbell and Sodini, 2007). Active investment strategies lead to forgone average annual equity returns of about 0.67%, as opposed to index investing (French, 2008). Out of those that do participate, financially sophisticated households are less prone to the disposition effect, which is described as the tendency to realize gains and hold on to losses (Dhar & Zhu, 2006). Furthermore, financial illiterate fail to make use of tax relief schemes as they often hold tax-preferred assets in tax-deferred accounts rather than taxable assets (Bergstresser & Poterba, 2004). Likewise, evidence shows that individuals fail to accumulate adequate retirement savings (Bernheim, Douglas, Garrett and Maki, 2001). Inefficient use of tax reliefs and grants results in lower wealth accumulation. At the average company 49% of employees are not even enrolled. Default options play a particularly important part, when it comes to projections of future government expenditures on redistributive transfer programs. As pension plan sponsors aim at high participation rates, low autoenrollment contribution rate on 401(k) plans are established. Low contributions result in inefficient use of the employer match. Studying match-eligible employees over $59\frac{1}{2}$, Choi et al.

(2011) found that this cohort forgoes on average 1.6% of their annual salary, as they contribute below the match threshold. If households fail to close this gap, the government will face high expenditures to strive against old-age poverty. Thus, declining statutory pension, increased life expectancy and an increasingly personalized pension environment may inflict serious damage on both households and the government.

5.2 Liability side of households

Turning to the *liabilities* side, we detect potential for better debt management. Haliassos and Bertaut (2006) found that 25% of all credit card holders carry their balances, although median liquid assets are found to be six times larger than the unpaid credit card debt. Median wealth of those who hardly ever carry a balance is approximately five times as large as the one of repeated revolvers. J.Y Campbell (2006) uses data from the U.K. mortgage market for adjustable-rate mortgages. The initial "teaser" rate is fixed for 2 years, after which it resets automatically. The new, much higher rate is based on an index plus an additional spread. Although those borrowers have the right to refinance their mortgages without penalty after 2 years, a sizeable number fails to make use of this possibility. Those without the right fail to refinance despite a spread large enough to cover the associated one-time cost. In the US, sluggishness of household refinancing is connected to an evitable total cost of $50-100 billion annually. Meier, Goette and Gerardi (2013) highlight that there is a 20-percentage points difference in the likelihood of default between the highest numerical ability cohort and the lowest. This insight is particularly interesting for policy makers, as the recent global financial crisis – which has been triggered by unprecedented increase in US subprime mortgage default rates – approximately inflicted costs of about $10 trillion worldwide (http://www.faz.net/aktuell/wirtschaft/schaetzung-krise-kostet-laut-studie-10-billionen-dollar-1841131.html).

6 Alternatives

6.1 Financial Regulation & the introduction of default options

In the wake of the global financial crisis, many experts called for increased regulation of the financial markets by governments. Households lost huge amounts of wealth and had to default on their debt. Shin and Kim (2017) show that in South Korea financial regulation was able to lower household debt and decrease financial fragility. However, they come at the cost of limiting the options of financially literate households. With the increasing complexity of financial decisions, default options set by employers are another viable strategy to lessen the impact of low financial literacy. They are especially well studied in connection to 401(k) pension plans. Many households fail to capitalize on employer matching contributions, which greatly hurts their returns on retirement savings (Holden & VanDerhei, 2003). By implementing a default contribution rate high enough to make use of the employers matching bonus – with the option to opt-out – these financial mistakes were reduced significantly. (Choi, Laibson & Madrian, 2004).

6.2 Financial Advisors

Delegating financial decisions to specialized financial advisors is another possible solution to the problem. In theory, households should be able to make use of the knowledge of professionals. Rather than investing in their own financial knowledge at high costs, they could use the benefits of division of labor by taking advice from experts. To profit from financial advice these experts need to be independent and trustworthy and their costs must not outweigh their benefits. Especially the last requirement seems unlikely to be met in the current environment. There is evidence that on average, neither financial advisors employed at banks nor independent financial advisors can outperform self-managed portfolios if you consider costs (Hackethal & Haliassos, 2011). They also highlight an agency problem occurring between advisors and household given the current incentive structure for financial advisors. Even with this in mind, there is still potential in financial advice as a possible solution if new low-cost alternatives – possibly based on data instead of human expertise – will get

established. Furthermore, findings suggest that financial advice might work better as a complement to, rather than a substitute for, financial literacy (Collins, 2012).

7 Forecast

With increasing diversity and complexity of financial products the importance of financial literacy will most likely continue to grow. Given the ongoing demographic change and its impact on the pension system, private retirements savings will be even more important than before. Additionally, technology and financial products will get more and more interdependent. The ability to gain access to cost-effective financial products is already strongly influenced by one's ability to use technology. In other words, there is a need to examine the impact of technological literacy and its impact on the financial outcome of a household in future research. Simultaneously, technological progress might provide new solutions to the problem. Data-based solutions have shown great success at a variety of tasks. It would not be surprising to see them being successfully applied to financial advice, too. They can also help financial education to be more efficient by micro-targeting different groups of households. (Duarte & Hastings, 2011).

8 Conclusion

The impact of financial literacy on economic well-being is non-negligible, even though evidence on the direction of causality between wealth and financial literacy is inconclusive.

Nevertheless, sophisticated households are less prone to financial mistakes which translates into higher wealth accumulation. Across countries financial literacy is found to be low. However, within a country people display different levels of financial knowledge. Heterogeneity in the level of financial literacy can be attributed to certain characteristics such as education, wealth and ethnicity. Financial literacy is linked to externalities that have sizeable effects on overall well-being, as they affect equilibria prices, employment and accumulation of retirement savings. Therefore, the research

regarding financial literacy as well as the effect and development of financial education programs is rightfully an important part of household finance. Current developments suggest that an inclusion of technological literacy might be an interesting topic for future research.

We believe, a combination of regulation, educational programs and financial advice, weighted differently for each individual is the best way to tackle the problems outlined throughout this paper.

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