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FINANCIAL MARKETS

## Over-optimism and consumer credit regulation

Florian Exler, Igor Livshits, James MacGee, Michèle Tertilt / 25 Feb 2025

Some consumers are over-optimistic about their future income and underestimate the probability of experiencing negative income shocks, while others have more accurate ('rational') beliefs. This column introduces a framework that considers behavioural and rational borrowers to assess the effects of potential regulatory interventions. Over-optimists benefit from being partially pooled with ('cross-subsidised' by) rational borrowers. Small-scale financial literacy education leads to welfare gains for over-optimists, but broad-based education leads to a welfare loss for over-optimists. Policymakers need to evaluate the impact of regulation on cross-subsidisation, given its significant consequences on welfare.

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Do borrowers' cognitive biases create a need for regulation to protect them from making mistakes when using credit? Proponents of consumer financial regulations often argue that some consumers overborrow due to behavioural biases, leaving them 'trapped in debt' (e.g. Dodd 2009). However, protecting consumers from mistakes when using credit may increase borrowing costs or reduce access to credit (Campbell 2016, Livshits 2020). Since these costs impact (other) users of credit, this seemingly leaves financial literacy as a possible path to help consumers make more informed credit choices without adverse side effects.

Much of the consumer protection debate has focused on high-cost credit markets such as credit cards. Unsecured credit card debt is characterised by relatively high interest rates and frequent defaults. High default risk leads lenders to invest substantial resources into

statistical methods to estimate and price default risk – a key driver of high interest rates – using information on a borrower's credit history (Livshits et al. 2016). Since these statistical methods provide a noisy signal of a borrower's true risk, they are likely to lead to a partial pooling of borrowers that make mistakes with lower-risk borrowers.

Despite the ongoing debate around consumer protection in high-cost credit markets, relatively little work has examined the regulatory (side) effects of policies targeted at improving outcomes for the subset of borrowers prone to making mistakes when using credit. In a recent paper (Exler et al. 2024), we build on Livshits et al. (2007) and Chatterjee et al. (2007) to develop a novel framework of unsecured debt and equilibrium default with behavioural and rational borrowers and use this to assess potential regulatory interventions. We show that taking these features of high-cost credit markets into account is crucial when evaluating consumer financial protection and financial literacy policies designed to help borrowers who misuse unsecured debt.

Substantial empirical work has documented that some consumers are over-optimistic about their future income (Dawson and Henley 2012, Balleer et al. 2021, Mueller et al. 2021) and underestimate the probability of experiencing negative events (e.g. Puri and Robinson 2007). Motivated by these findings, we assume that some consumers are over-optimistic and place too low a probability on negative income shocks, while others have correct (rational) beliefs. Since over-optimists believe they face the same risks as rational consumers, they differ from realists in being more prone to bad shocks and being unaware of the worse risks they face. Although conceptually these are distinct features, respondents in the Survey of Consumer Finances with low financial-literacy scores (based on the three literacy questions of Lusardi and Mitchell 2023) report being surprised by low income realisations more often (and have lower income on average) than individuals with high literacy scores.

Not surprisingly, low literacy scores are more common amongst the non-college educated than amongst those with at least a bachelor's degree (31% versus 15%; see Table 1). Interestingly, however, the difference between low and high financial literacy is virtually identical across education groups: low-literacy individuals are about 1.3 times more likely to report being surprised by low income realisations than high-literacy individuals.

**Table 1** Unusual income and financial literacy

	<b>Financial literacy</b>	<b>Share</b>	<b>Fraction unusually low income</b>
<b>No college</b>	Low	0.31	0.22
	High	0.69	0.17
<b>College</b>	Low	0.15	0.18
	High	0.85	0.14

**Notes:** Financial literacy is classified as 'low' if respondents correctly answer 0 or 1 (out of 3) financial-literacy questions, and 'high' if they answer 2 or 3 correctly. The estimates are based on pooled data from the 2016 and 2019 waves of the Survey of Consumer Finances. 'College' households are those whose head has at least a college degree.

We show that over-optimism gives rise to a tractable model of type scoring, where lenders price credit based on beliefs about a borrower's type and update these scores over time. Type scoring – which brings a notion of credit scoring to the model – results in the partial pooling of behavioural and non-behavioural consumers. 'Partial pooling' means that pooling takes place between over-optimistic and rational borrowers with identical observable characteristics – and consequently identical type scores.

The coexistence of over-optimistic and rational consumers combined with the endogenous pricing of credit risk and partial pooling leads to spillovers in borrowing and default decisions between behavioural and rational borrowers. Over-optimists make mistakes by overborrowing and defaulting too late compared to an informed consumer. However, the higher default rates of over-optimists combined with their being (partially) pooled with rational borrowers mean that over-optimists benefit from being cross-subsidised by rational borrowers.

Cross-subsidisation introduces a novel mechanism: credit-market interventions targeted at reducing mistakes by behavioural borrowers may also affect rational borrowers. Additionally, if helping behavioural borrowers avoid mistakes also reduces cross-subsidisation, then this could lessen the benefit to them of regulatory interventions.

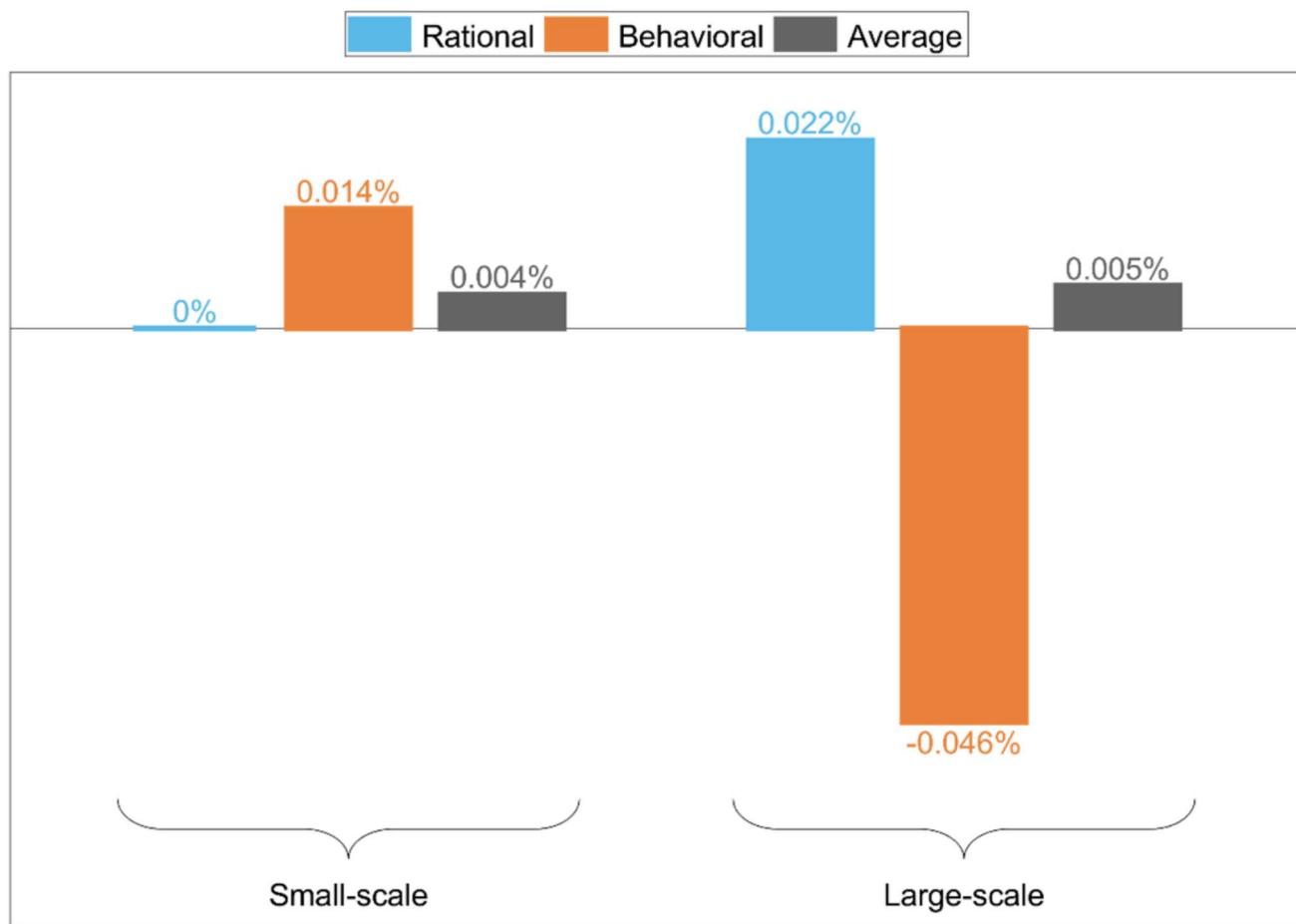
We show theoretically that the mistakes by behavioural consumers can create scope for welfare-improving regulation that limits access to risky (and expensive) debt. Conditioning the borrowing restrictions on a type score can further improve welfare by better targeting the policy. These forces carry over to the quantitative model that is calibrated to the US economy. Over-optimistic consumers overborrow, have higher levels of debt, and default more often than rational consumers. These mistakes seemingly support the case for regulations to protect behavioural consumers. However, we show that the endogenous partial pooling of behavioural and rational consumers makes designing effective regulation challenging.

## Financial literacy education on a small scale can lead to welfare gains

A surprising finding is that financial literacy education, which educates behavioural borrowers to avoid financial mistakes, has very different implications when done on a small scale versus on a large scale. Our counterfactual exercise considers a financial-literacy intervention that prevents overborrowing by informing over-optimists of their true income risks. This programme results in over-optimists no longer making mistakes such as overborrowing. (Arguably, avoiding all mistakes is the best-case scenario for any literacy campaign.) When holding lenders' type scoring and pricing schedules fixed – corresponding to a small-scale financial-literacy intervention – eliminating financial mistakes via financial literacy leads to welfare gains for over-optimists (see ‘small scale’ in Figure 1).

However, a broad-based financial literacy education that changes the behaviour of over-optimists in the entire population would prompt lenders to update pricing. When this change in behaviour allows lenders to identify over-optimists, lenders would charge over-optimists and rational borrowers different (actuarially fair) interest rates. This ends the cross-subsidisation that over-optimists enjoy in the form of lower interest rates from being pooled with rational borrowers. As a result, over-optimists experience a welfare *loss* more than three times the initial gain from a small-scale experiment. However, rational consumers benefit from the breakdown of pooling (see ‘large-scale’ in Figure 1).

**Figure 1** Welfare gains from financial literacy



These experiments suggest that extrapolating benefits from small-scale financial literacy experiments – which have been found to be effective in changing consumer behaviour (e.g. Urban et al. 2022) – may mischaracterise the effects of large-scale programmes which prompt lenders to adjust their lending criteria. Perhaps more importantly, this example also illustrates the potential for unintended side effects of credit-market interventions when lenders change their pricing strategies in response to improved financial decision-making of consumers (Vaitilingam 2016) or regulation.

We evaluate two other regulatory policies that target overborrowing: (1) making borrowing more costly by increasing the operating and compliance costs of lenders (which we model as a proportional transaction tax); and (2) introducing a borrowing limit via a debt-to-income cap. A tax on borrowing lowers the welfare of both types of consumers and has mixed effects on overborrowing and filing of different education groups. Similarly, introducing a cap on the debt-to-income ratio results in lower welfare for all types of consumers despite reducing mistakes by over-optimists.

## Could more targeted policies improve welfare?

Could more-targeted policies improve welfare? As in the real world, directly targeting behavioural borrowers is impossible in our framework because borrower types are not directly observable. However, we can use information aggregated by lenders to analyse debt-to-income limits targeted at borrowers with low type scores (and a high probability of being over-optimists).

We find that such borrowing limits reduce borrowing and default, especially in the non-college-educated population, which are often prime regulatory objectives. However, these targeted policies still reduce welfare for both types as the cost of restricting access to credit for some borrowers still exceeds the benefits. This suggests that metrics based on debt and default may provide a misleading guide to the benefits of credit-market regulations.

Our quantitative findings pose a cautionary tale for the effectiveness of consumer financial regulation. Although regulating high-cost credit to protect behavioural borrowers from their mistakes could in theory improve welfare, our quantitative simulations imply that even policies that effectively limit the financial mistakes of behavioural borrowers can be welfare decreasing. Of course, alternative assumptions around the nature of behavioural biases, the nature of competition, or a richer set of lending contracts may lead to different results and could strengthen the case for consumer-protection regulations.

While our research is far from the last word on assessing regulatory policies, an important lesson for regulation is that default risk can lead to cross-subsidisation across borrowers. Our research suggests that evaluating the impact of regulation on cross-subsidisation is important since it can have significant welfare consequences.

*Authors' note: The views expressed here are those of the authors and do not represent those of the Federal Reserve Bank of Philadelphia, the Federal Reserve System, or the Bank of Canada.*

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