Research Statement

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I am a quantitative macroeconomist with current focuses on consumer finance as well as financial intermediation. I am also enthusiastic about efficient numerical methods for solving heterogeneous agent models. My current research aims to understand households' borrowing/default behavior and how such behavior interacts with financial intermediaries.

The Payday Loan Puzzle (joint with Jan Sun, Ph.D. candidate at the University of Mannheim)[1]

Why do many credit cardholders in the U.S. turn to expensive payday loans, even when they have not yet exhausted their far cheaper credit lines?[2] Agarwal et al. (2009) documented that two-thirds of payday loan users have at least $1,000 liquidity left on their credit cards when taking up their first payday loan. This puzzling behavior results in average annual monetary costs of $200 and has been coined the "Payday Loan Puzzle." [3] We propose a novel rational explanation: households use payday loans to protect their credit scores since payday lenders do not report to credit bureaus. Using a quantitative macro model, we show that people may rationally choose expensive payday loans over cheaper borrowing alternatives to protect their credit scores. Our micro-funded framework can also be used to inform the policy debate over payday lending in the U.S.[4] We find that either banning payday loans or increasing their default costs result in aggregate welfare losses. We plan to study the welfare implication of the recent U.S. credit reporting relief in the Coronavirus Aid, Relief, and Economic Security (CARES) Act in response to the COVID-19 pandemic. This relief program allows individuals to have late payments without affecting their credit scores.

Consumer Bankruptcy: the Role of Financial Frictions[5]

To what extent does the welfare implication of consumer bankruptcy laws vary with the presence of financial frictions? In particular, through what channels do financial frictions affect the welfare conclusion? The role of financial frictions in consumer bankruptcy regulation has not yet been studied in the literature. Increased bankruptcy leniency leads to higher default premia, thus making borrowing more expensive relative to saving. In equilibrium, banks become more leveraged due to increased deposits. However, higher leverage tempts banks into diverting assets. To avoid such malpractice, depositors require banks to have skin in the game: an extra leverage premium is attached to the returns on assets, thus making diversion more costly for banks.[6] I extend a consumer default model with the

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aforementioned financial frictions and revisit the welfare conclusion of consumer bankruptcy regulations. I find that when financial frictions exist, households prefer a strict bankruptcy regime instead of a lenient one that they would prefer without financial frictions. This distinction results from the leverage and divestment channels of financial frictions: (1) leverage channel: the extra leverage premium leads to an increase in borrowing prices, thus making households harder to smooth consumption intertemporally; and (2) divestment channel: the extra leverage premium crowds out banks' investment in physical capital, thus giving rise to lower earnings for households.

The Conundrum of Matching High Volatility of Unsecured Credit

Unsecured credit exhibits high volatility over business cycles. However, even consumer default models with cyclical earnings processes fail to account for this stylized fact (Nakajima and Ríos-Rull, 2014).[7] This inadequacy leads to a question on what other factors can help the standard model quantitatively account for this moment. One potential factor is banks' risk-aversion. When the dispersion of individual earnings increases in a recession, banks become more uncertain about their expected profits. Risk-aversion thus induces banks to charge an extra risk premium to compensate for this uncertainty. This extra premium, in turn, worsens individuals' ability to smooth consumption with borrowing, thus leading to a drop in unsecured credit in a recession, as observed in the data. This project's objectives are: (1) examine whether banks' risk-aversion can quantitatively explain the high volatility of unsecured credit;[8] and (2) study how the banks' risk aversion alters the welfare implication of personal bankruptcy regulations across economic upswings and downturns; and (3) investigate what policies can be implemented to maintain economic stability over business cycles.

The Bank Lending Channel of Monetary Policy: Firm Heterogeneity and Misallocation

To boost the economy, central banks conduct an accommodative monetary policy that lowers banks' cost of funds. Theoretically, a lower borrowing rate thus increases firm investment and economic growth. However, the distribution of firm productivity becomes more dispersed during economic downturns, and banks cannot perfectly observe each firm's actual productivity.[9] This increased asymmetric information concerning the productivity dispersion of each frim results in inefficient allocation of funds. In addition to the misallocation, low-productivity firms' failure to repay loans in the subsequent period also prolongs the recession. This project's objectives are: (1) quantitatively investigate the effectiveness of the bank lending channel when firm productivity is time-varying and unobservable to banks; and (2) quantify the effects of misallocation; and (3) study what temporary measures can be used to mitigate the potential misallocation due to an expansionary monetary policy.

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[7] Cyclical earnings processes mean that households face different earnings prospects across boom-bust cycles. In particular, the earnings distribution has lower mean and higher variance in a recession, and vice versa.

[8] A numerical difficulty that arises immediately is how to deal with the non-linear loan pricing schedule since: (1) the stochastic discount factor depends on the covariance between expected banking net worth and borrowers' repayment prospects; (2) an individual's repayment probability depends additionally on how banks respond to others' default behavior (negative externality).

[9] For example, firms may become worse in predicting the expected returns of investment plans in a recession.