

**Does Loan Maturity Matter in Risk-based Pricing?  
Evidence from Consumer Loan Data**

Gabriela Pásztorová

**CERGE-EI**

GDN/CERGE-EI Regional Research Competition

Project RRC 12+78

**Non-technical Summary**

This paper investigates the role of loan contract terms in the performance of consumer credit. Taking advantage of a unique sample of both accepted and rejected consumer loans from a Czech commercial bank, it contributes to the growing literature on credit scoring models in several ways:

- The paper develops a model that estimates loan demand and loan repayment jointly. Loan demand elasticity is estimated with respect to maturity and interest rate, while accounting for two challenges: the sample selection bias that appears due to limited information on rejected applicants, and the endogeneity of loan contract terms which is caused by both interest rate and maturity being dependent on loan demand.
- Using demand estimates in default probability prediction, the paper sheds light on the role of maturity in purchasing behavior and subsequent loan performance. It focuses on the role of a risk-based maturity setting in decreasing the information asymmetries between lenders and borrowers.

The most important findings are the following:

- Loan demand by low-income borrowers is more sensitive to loan maturity changes than to interest rate changes. The paper shows that low-income borrowers are liquidity constrained (do not have sufficient funds to finance their desired consumption with resources that they will accumulate in the future) and thus have limited access to credit at market interest rates. These borrowers are likely to prolong the maturity of their

loans in order to borrow the desired loan amount, i.e. they prefer to have reduced monthly cash flow rather than decreased interest rates.

- A risk-based maturity setting improves the quality of granted consumer loans and alleviates the adverse selection present on the lending market. By reflecting the borrower's default probability (henceforth referred to as a borrower's 'riskiness') in the interest rate, lenders discourage "high-risk" borrowers from short-term loans, and by prolonging their loan maturity, decrease their default probability. More specifically, the results suggest that given risk-based pricing, an increase in loan maturity decreases the probability of default by 12%. This is consistent with the theoretical predictions that reduced asymmetric information encourages "high-risk" borrowers to either demand lower loan amounts or to prolong their loan maturity to compensate the lender for their riskiness.
- The time of default is maturity-dependent and differs across borrowers in the different risk categories. More importantly, hazard models that differentiate between loan maturities and risk bands have an equally good model fit as the one that treats all consumer loans as pooled and does not distinguish between these two factors.

**Keywords:** credit scoring, consumer loans, asymmetric information