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IMPERFECT INFORMATION AND CREDIT RATIONING: COMMENT

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In an article in this *Journal* Jaffee and Russell [1976] developed a model of loan-markets to explain the rationing of credit. It will be shown that they confused competitive supply curves with zero profit curves, and when this is corrected, the competitive model no longer supports the conclusion that credit can be profitably rationed.

Borrowers maximize utility by taking out loans L, at interest rate factors R, but on average repay only a fraction λ of the debt. The repayment factor declines with increases in total debt:

$$\lambda = \lambda(LR), \qquad \lambda' \leqslant 0.$$

The lenders "maximize the expected value of their profits" from each loan customer:

$$\pi = LR\lambda(LR) - LI,$$

where I is the cost of funds.

Jaffee and Russell "consider lender behavior and the resulting market equilibrium with competitive conditions in the loan market" but characterize the supply curve by the zero profit condition,

$$R\lambda(LR) = I. \tag{1}$$

"In modern economic theory, an industry is said to be competitive only when . . . no individual firm finds itself able to influence the commodity's price" [Sherer, 1970, page 9]. A profit-maximizing, competitive firm will therefore supply loans along a curve characterized by the first-order condition,

$$R\lambda(LR) + LR^2\lambda'(LR) = I. \tag{2}$$

In Figure I the locus $\overline{OTSV}$ is the zero profit curve, while $\overline{OTS^*V^*}$ is the supply curve of the competitive firm in the short run.

The short-run competitive equilibrium interest rate equals R^*, not R_s, as Jaffee and Russell claim. At interest rate R_s the competitive lender would find L' to be the most profitable loan, not L_s because additional loans do not correctly account for the decrease in loan repayments.

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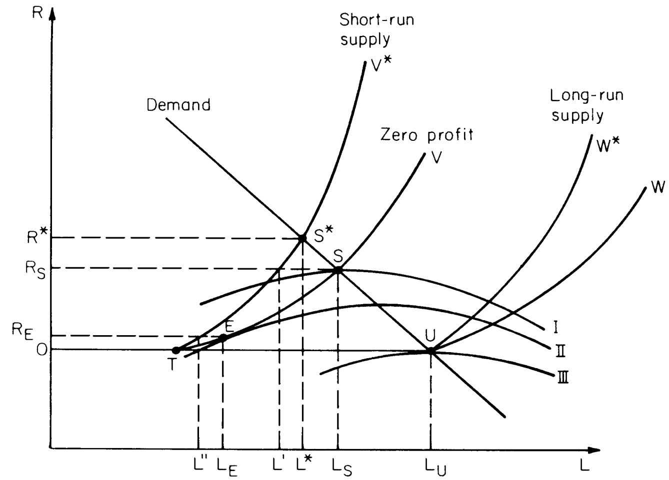

FIGURE I

Jaffee and Russell go on to argue that the contract (loan and interest rate) E, which maximizes the borrower's utility (indifference curves are labeled I, II, and III) subject to zero expected profit dominates contract S, their (mistaken) competitive equilibrium contract. E does involve credit rationing, since it lies to the left of the demand curve, but it does not dominate the (correct) competitive equilibrium contract S^* because at interest rate R_E the price-taking lender would be willing to lend only L'' (additional debt lowers debt repayment suboptimally). Put another way, E dominates S but not S^*. Applying the envelope theorem to the expected profit maximization problem gives

$$\text{(3)} \qquad \frac{d\pi}{dR} = L\lambda + L^2R\lambda' = \frac{LI}{R} > 0,$$

where the second equality follows from the first-order condition (2). To improve the debtor's welfare, interest rates must decline, but inequality (3) implies that the lender's expected profit will therefore diminish.

The competitive equilibrium contract S^* results in positive expected profit, and this will attract lenders to this market. Jaffee and Russell appear to interpret "competitive market" as one with no barriers to entry, but exactly how new entrants draw customers away from the established lenders is unspecified. Four of their assumptions seem to be incompatible: price taking, profit maximization, zero profits, and one lender per customer. As they point out, a monopolistic lender will not ration credit, so price taking is to be preserved. The competitive, profit-maximizing, new entrant does not offer lower interest rates, since these are treated as parameters, but would extend additional credit at market interest rates above R^* or less credit at interest rates below R^*. Since the customer is serviced by exactly one lender, such a change in market interest rates will create disequilibrium between supply and demand.

This leads to the conclusion that more than one lender may service each customer if price taking, profit maximizing, and zero profit are immutable. How will lenders view the expected repayment of their loan when the borrower has debt obligations to many lenders? Two extreme cases are that the lender assumes that his repayment factor is dependent only on the size of his loan; or that the lender views the repayment as depending on the total debt of n lenders exactly like himself.

In the first case with many identical lenders with supply curves $\overline{OTS^*V^*}$, the total market supply to the customer is the horizontal summation $\overline{OUW^*}$. Long-run competitive equilibrium would occur at contract U, where simultaneously supply equals demand and profits equal zero along $\overline{OUW}$. The lenders' naive assumption about loan repayment will be exposed, since total debt L_u is significantly larger than the debt owed to any one lender. No credit is rationed at U.

In the second case the lender anticipates a profit,

$$\pi = LR\lambda(nLR) - LI.$$

For fixed n, equilibrium occurs at competitive interest rate R^* with each lender extending credit in the amount L^*/n. The first-order condition for this lender is

$$R\lambda(nLR) + nLR^2\lambda'(nLR) = I.$$

With $R = R^*$, the solution of this equation for the compound term nL is L^*, and this produces equilibrium. The profit of each lender is $1/n$th of the profit of the single lender equilibrium so the profit per lender drops toward zero as entry occurs but is always positive. If there is a fixed cost to transacting a loan F, then eventually net profit $\pi - F$ will be driven to exactly zero. The long-run equilibrium in this case matches market supply with customer demand L^*—no credit is rationed.

In summary, Jaffee and Russell mis-characterize a competitive equilibrium in their model of loan-markets and when this is done correctly, in both the short and long run competitive lenders find credit rationing unprofitable.

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REFERENCES

Jaffee, D. M., and T. Russell, "Imperfect Information and Credit Rationing," this *Journal*, XC (Nov. 1976), 651–66.

Scherer, F. M., *Industrial Market Structure and Economic Performance* (Chicago: Rand McNally, 1970).