

# WHEN DOES PREDATION DOMINATE COLLUSION? BANKRUPTCY AND (JOINT) MONOPOLIZATION

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## EXTENDED ABSTRACT

I study a simple model of repeated Bertrand competition between oligopolists. The only novelty is that firms may go bankrupt and permanently exit: the probability that a firm survives a price war depends on its financial strength, which varies stochastically over time. In that setting, an anti-folk theorem holds: when firms are patient, every subgame perfect equilibrium involves an immediate price war that lasts until only a single firm remains.

That result follows from two lemmas concerning limiting behavior in equilibrium as firms become more and more patient. The first lemma shows that each firm gets an expected payoff equal to the monopoly payoff times the firm's probability of winning a price war - that is, payoffs are those that would result from an immediate price war. The intuition is that each firm can guarantee itself that payoff by starting a price war, and those guarantees summed across firms equal the total available profit. The second lemma shows that the expected discounted time until all firms but one are bankrupt approaches zero. The intuition for that result is that a firm initially in a strong financial position relative to its rivals prefers starting a price war right away to risking a deterioration in its position. By the first lemma, such a deterioration would result in a lower continuation payoff than the expected payoff from an immediate price war.

To avert a price war, firms that are initially weak might prefer to promise a strong rival a large share of the future stream of profits. However, when those weak firms eventually become strong they are no longer willing to make the promised transfers;

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they prefer to take their chances with a price war. Thus, an initial price war cannot be averted.

The model can also explain observed patterns of collusion and predation in markets. For a fixed level of patience, equilibria exist where firms collude when they have equal financial strengths and fight only when one is stronger. Collusion between  $n$  firms may be sustainable when collusion between  $n - 1$  or  $n + 1$  firms is not. The possibility of entry (at a cost) facilitates collusion: a potential entrant might risk a price war against a single firm, but the chances of winning a price war against multiple firms are low enough to discourage entry.

The analysis also applies to bargaining models of war, and it can be extended to a class of stopping games.