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Contingent Renewal Contracts in High-tech Manufacturing with Oligopolistic Suppliers

High-tech manufacturers (OEMs) often produce multiple generations of high-tech end-products. For each generation an OEM has to source complex components from a few oligopolistic suppliers. Due to the high shortage costs for missing components, resulting from costly delays in production of the end-product, it is important to align incentives between OEMs and suppliers of these components that are often single-sourced. We formulate an infinite horizon perfect information game with two possible suppliers where the payoffs in the current generation and transition probabilities for the next generation depend on the capacity investment of the current supplier. We express the suppliers' optimal capacity investment as a function of the wholesale price paid by the OEM and the capacity investment decision of the alternative supplier. We show that for every wholesale price there exists an equilibrium where neither supplier has incentive to adjust their capacity decision. Additionally, we show that the wholesale price for which in equilibrium the supply chain optimal capacity decision is made is lower than the coordinating wholesale price when only a single supplier is present, but higher than in case there is an unlimited number of suppliers.