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Process innovation and the choice of competition mode in Mixed Oligopoly

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There is a well established line of research analysing the effects of Bertrand and Cournot competition on profit and social welfare. In a seminal paper, Singh and Vives (1984) show that choosing quantity (price) contract is the dominant strategy for both firms when the goods are substitutes (complements). Furthermore, firms' profits are higher under Cournot competition whereas Bertrand competition yields higher social welfare when the competing firms are profit-maximizers. In many countries, however, private firms compete with state-owned enterprises (mixed market). Studies on mixed oligopolies mainly focus on optimal privatization policy. Recently, the endogenous choice of competition modes in mixed oligopoly has gained more popularity. Focusing on the heterogeneity of ownership structures, Ghosh and Mitra (2010) showed that price competition offers higher profitability to both private and public firms. In line with this, Matsumura and Ogawa (2012) showed that irrespective of whether the goods are substitutes or complements both firms opt for price competition when confronted with an endogenous choice of price and quantity competition.

Although the strand of existing literature are conducive and provide a fair understanding of the optimal privatization policy and firm's desired mode of product market competition, there has been no theoretical attempt to analyse the effects in mixed oligopoly when the firms allocate a significant amount of their budget towards R&D investments. In particular, we aim to revisit the classic question of price and quantity contract where both private and public firms invest in cost reducing R&D. We find that choosing price contract is the dominant strategy for both firms. Public firm generates higher R&D investments than private firm irrespective of the mode of market competition. We further show that the standard profit ranking under Cournot and Bertrand (see Singh and Vives, 1984) can be reversed in a mixed market when the degree of product differentiation is low.