Mixed oligopoly, foreign firms, and location choice

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Abstract

We investigate a mixed market in which a state-owned, welfare-maximizing public firm competes against n domestic private firms and m foreign private firms which are all profit-maximizing. A circular city model with quantity-setting competition is employed. We find that the equilibrium location pattern depends on m. All private firms agglomerate in the unique equilibrium if m is zero or one. Two foreign firms induce differentiation between domestic and foreign private firms. More than two foreign firms yield differentiation among the foreign firms. Regardless of n and m, agglomeration of all domestic private firms appears in equilibrium. We provide several conditions in which eliminating the public firm from the market enhances social welfare. We extend the basic model and investigate three issues concerning multiple public firms, inefficiency of the public firm, and entries by private firms. We obtain some additional implications of welfare and equilibrium locations.
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1. Introduction

Studies of mixed markets, in which state-owned welfare-maximizing public firms compete against profit-maximizing private firms, have become increasingly popular in recent years.[1] Mixed oligopolies are common in developed, developing, and former communist transitional economies.[2] In Japan, in particular, competition between private and public firms exists in many

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[1] For pioneering work on mixed oligopolies, see Merrill and Schneider (1966). See Bös (1986, 1991), Vickers and Yarrow (1988), and Nett (1993) for excellent surveys.

[2] The interest in mixed oligopolies is due to their importance to the economies of Europe, Canada, and Japan more than to that of the US. However, there are examples of mixed oligopolies in the US, such as the packaging and overnight-delivery industries.

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oligopolistic markets, such as those for banking services, housing loans, life insurance, broadcasting services, and overnight deliveries.[3]

In many of these mixed markets, it is often the case that private firms adopt very similar strategies, exhibiting "herd behavior" that differs from that of public firms. The herd behavior exhibited by Japanese city banks is a typical example. In this market, private banks compete domestically against strong public banks, such as the Postal Bank and the Public House Loan Corporation. Accordingly, many of these private banks rush into the international financial markets to avoid domestic competition.[4]

Most existing works on mixed oligopoly, as well as our earlier work, investigate the competition between public and domestic private firms. In real world economies, however, competitors of public firms are not limited to domestic private firms. For example, the New Zealand government set up a state-owned public bank to compete against private foreign banks. Similarly, when the government of Brazil bargained with the Swiss medical company Roche, it used a public medical institution as a potential competitor in the domestic market. Électricité de France and Gas de France also compete against foreign private firms in the EU energy markets. Recently, many foreign private financial institutions rushed into the Japanese financial markets, which are typical mixed markets, as discussed above. Airline, telecommunication, natural gas, electric power, automobile, and steel industries in many developed and developing countries are also typical examples. Recently, the literature on mixed oligopoly with foreign competitors has begun to appear, including Fjell and Pal (1996), Pal and White (1998), and Matsumura (2003a). All of these studies indicate that the existence of foreign competitors (even a single one) drastically changes the equilibrium outcomes.

In this paper, we also consider foreign competitors explicitly and investigate how the presence of foreign competitors affects the "herd behavior" in mixed oligopolies. We again use a location model with a circular city in which firms deliver goods (shipping model).[5] We find that the number of foreign firms substantially affects the equilibrium location patterns. If the number of foreign competitors is zero or one, the equilibrium location pattern is unique, and all private firms (both domestic and foreign) agglomerate at the side of the circle opposite the location of the public firm. In other words, a single foreign firm does not affect the equilibrium locational choices of private firms. However, if the number of foreign firms is two, multiple equilibria appear. In every equilibrium, each domestic private firm inevitably changes its location, while it is possible that two foreign private firms still locate at the side of the circle opposite the location of the public firm. If the number of foreign private firms is more than two, agglomeration of foreign firms never appears in equilibrium. In other words, more than two foreign firms yield differentiation among the foreign firms. Regardless of the number of foreign private firms and that of domestic private firms, it is possible that all domestic private firms agglomerate at one point, although the point of agglomeration depends on the number of foreign firms. These results then indicate that when the number of foreign firms is relatively small, the effects on the locational choices by domestic firms are limited. An increase in the number of foreign firms causes a change of locational choice by domestic private firms, and a further increase yields diversification among foreign private firms, while it is possible for diversification among domestic private firms to be limited (herd behavior).

We extend the basic model and investigate three issues concerning multiple public firms, inefficiency of the public firm, and entries by private firms. In the first issue, we show that the locations of

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[3] See, e.g., Ide and Hayashi (1992).

[4] Several examples of herd behavior are described in Matsushima and Matsumura (2003).

[5] For discussions on mixed oligopoly with spatial competition, see Cremer et al. (1991), Matsushima and Matsumura (2003, 2004), and Nilssen and Sørgard (2002). For applications of circular-city shipping Cournot models see, for example, Matsushima (2001) and Matsumura (2003b).