Presence of Foreign Investors in Privatized Firms and Privatization Policy

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Abstract

We investigate how the presence of foreign investors affects privatization policy in a mixed oligopoly. We find that an increase in foreign investors' stockholding ratio in a privatized firm increases the optimal degree of privatization.

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Key words: partial privatization, foreign investment in privatized firms, foreign private competitors

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1 Introduction

Privatization, defined as the deliberate sale of a state-owned enterprise to the private sector, appears in more than 100 countries. One interesting aspect of privatization is that the sale of a state-owned enterprise is not only limited to domestic private investors. Nowadays, foreign investors, including both private and public funds, are influential buyers of former public enterprises. Alexander Bank in Egypt was sold to San Paulo Bank in Italy for 1.6 billion in 2006. Also, the Central Bank of Egypt announced the sale of 80% of Cairo Bank's shares to the private sector in the first half of 2008 and five foreign banks intend to participate in the bid. The Turkish government sold 55% of the stocks in Turkey Telecommunication to Saudi Telecommunication for 6.5 billion and it also sold the public tobacco enterprise by auction and four groups including both foreign and domestic investors participated in the bid. The holdings of foreign investors in VW, Renault, JR, NTT, and JT, all of them are also held by the public sectors partially, are also not negligible. Including these examples, we can find foreign investments in former public firms all over the world.

In spite of the importance of foreign investors in privatized firms, the relationship between the presence of foreign investors in privatized firms and privatization policy is rarely discussed. In the literature on mixed oligopoly, many works have already studied competition between **domestic** public firms and foreign private firms.¹ Some adopt a partial privatization approach and discuss how competition between foreign private firms affects the optimal degree of privatization.² However, none of them consider foreign investments in partially privatized firms.

This paper considers that buyers of (partially) privatized firms can be foreign investors and investigates how the presence of foreign investors in privatized firms affects the optimal privatization policies. We adopt a partial privatization approach and investigate the optimal degree of privatization.³ We find that an increase in the presence of foreign investors in privatized firms increases the optimal degree of privatization. This indicates that open policies in capital markets and privatization policies can be complementary, making a sharp contrast to the existing works which suggests that open policies in product market and privatization policies are substitutes.

¹ See Corneo and Jeanne (1994), Fjell and Pal (1996), Pal and White (1998), Fjell and Heywood (2002), Matsumura (2003), and Bárcena-Ruiz and Garzón (2005a,b).

 $^{^2}$ See works cited in footnote 3 in the context of international trade.

³ Partial ownership in privatized firms is observed all over the world, and has become increasingly popular in this field. Partial privatization has been intensively discussed in the literature. For a general discussion, see Matsumura (1998). Also see Chang (2005), Chao and Yu (2006), and Fujiwara (2006) in the context of international trade, Kato (2006) and Ohori (2006) for environmental problems, Tomaru (2006) for tax and subsidy policies, Matsumura and Kanda (2005) and Fujiwara (2007) in free entry markets, Lu and Poddar (2007) for product differentiation, and Bárcena-Ruiz and Garzón (2003) for merger problems.

2 The Model

Firms produce perfectly substitutable commodities for which the market demand function is given by p = a - Q(price as a function of quantity). Firm *i*'s cost function is given by $c_i(q_i) = (1/2)(q_i)^2$ where q_i is the output quantity of firm i (i = 0, 1, ..., m).⁴ Firm 0 is a semipublic (partially privatized) firm and it competes against private firms in the domestic product market. Foreign investors hold shares $\gamma \in [0, 1]$ and domestic private investors hold shares $(1 - \gamma)$ in firm i (i = 1, ..., m). Instead, if we ignore the integer problem of the number of firms, we can assume that γm firms are foreign private firms and $(1 - \gamma m)$ firms are domestic private firms. All results holds true in this setting, too. Thus, γ represents the degree of foreign penetration in the domestic product market.

Initially the government holds all the shares in firm 0. In the first stage, the government sells $\alpha \in [0, 1]$ shares in firm 0 and foreign investors (res. domestic investors) buy $\alpha\beta$ (res. $\alpha(1 - \beta)$) shares in firm 0. The government chooses α so as to maximize the domestic social surplus, given β and γ . We assume that the financial market is complete and competitive. Thus the government obtains $M(\alpha, \beta, \gamma) = \alpha \pi_0^e$, where π_0^e is the expected profits of firm 0 realized in the subsequent stage.⁵ We assume that investors are rational and know correctly what happens in the subsequent stage (perfect foresight assumption). M depends on β and γ as well as α because β and γ affect the equilibrium value of π_0 , which is discussed in the next section.

In the second stage, after observing α , β , and γ , each firm *i* chooses q_i (i = 0, 1, ..., m) independently (Cournot competition). Let $\sum_{i=0}^{m} q_i$ be Q. The profit of firm *i* is given by $\pi_i = p(Q)q_i - c_i(q_i) = (a - Q)q_i - q_i^2/2$. Firm i (i = 1, 2, ..., m) maximizes π_i . Firm 0 maximizes $U_0 = \alpha \pi_0 + (1 - \alpha)W$, where W is the total domestic social surplus.⁶ Let CS be the domestic consumer surplus, given by $CS = (1/2)(Q)^2$. W is given by:

$$W = CS + (1 - \alpha\beta)\pi_0 + \sum_{i=1}^m (1 - \gamma)\pi_i + \beta M(\alpha, \beta, \gamma).$$

$$\tag{1}$$

The government obtains M while βM appears in (1). $(1 - \beta)M$ is just a transfer from domestic investors to the government, thus it does not constitute domestic welfare. Note that the second term in W includes $\alpha(1 - \beta)\pi_0$ (obtained by domestic stockholders in firm 0) as well as $(1 - \alpha)\pi_0$ (obtained by the government).

⁴ This formulation of demand and cost is popular in the literature of mixed oligopoly. See De Fraja and Delbono (1989), Fjell and Pal (1996), and Pal and White (1998).

 $^{^{5}}$ If we consider the multi-stage competition over multiple periods, it must be the discounted sum of profits of firm 0. All of our results hold if we consider multi-stage competition.

 $^{^{6}}$ This is a standard formulation of the payoff of a semipublic firm. See the works mentioned in footnote 3.

3 Equilibrium Analysis and Results

We use the subgame perfection as the equilibrium concept. We solve the game by backward induction.

3.1 Second stage

We restrict our attention to the symmetric equilibrium where all private firms choose the same output level. Thus, we restrict our attention to q_0 and q_1 . The first-order conditions of firm 0 and firm 1 are respectively:

$$-(2 + \alpha - 3\alpha\beta + 3\alpha^2\beta)q_0 + (1 - \alpha\beta + \alpha^2\beta)a - (1 - \alpha\beta + \alpha^2\beta - \gamma(1 - \alpha))(\sum_{i=1}^m q_i) = 0,$$
 (2)

$$a - q_0 - \sum_{i=2}^{m} q_i - 2q_1 = 0, \tag{3}$$

Note that M is determined in the first stage, so it is given exogenously in this stage. The second-order conditions are satisfied. Substituting $q_2 = q_3 =, ..., = q_m = q_1$ into (2) and (3) and solving these equations yield the equilibrium outputs:

$$q_0^S = [2(1 - \alpha\beta + \alpha^2\beta) + m(1 - \alpha)\gamma)]a\Delta^{-1}, \ q_1^S = [1 + \alpha - 2\alpha\beta + 2\alpha^2\beta]a\Delta^{-1},$$
(4)

where $\Delta \equiv 2(2 + \alpha - 3\alpha\beta + 3\alpha^2\beta) + m(1 + \alpha - 2\alpha\beta + 2\alpha\beta^2 + (1 - \alpha)\gamma)$. The superscript S stands for the equilibrium values in the second stage.

3.2 First stage

The government maximizes W with respect to α . Substituting $M = \alpha \pi_0^e = \alpha \pi_0^S$ into (1) we have:

$$W(\alpha,\beta,\gamma) = CS^{S}(\alpha,\beta,\gamma) + \pi_{0}^{S}(\alpha,\beta,\gamma) + m(1-\gamma)\pi_{1}^{S}(\alpha,\beta,\gamma).$$
(5)

The first-order condition for the government is $(m - m\gamma + m^2\gamma) - G\alpha - 2K\alpha^2 = 0$, where $G \equiv 4(1 - \beta) + m(1 + 5\gamma - 6\beta\gamma) + m^2\gamma$ and $K \equiv 2\beta + 3m\beta\gamma$. Let α^* denote the equilibrium α in the game. We have:

$$\alpha^* = \frac{-G + \sqrt{G^2 + 8(m - mr + m^2 r)K}}{4K}.$$
(6)

We present our result.

Proposition 1 (i) α^* is increasing in β and (ii) α^* is decreasing in γ . Proof From (6) we have: $d\alpha^*/d\beta = (-H + 2KL + (2K+G)\sqrt{H})/(4\beta K\sqrt{H})$, where $H \equiv (8m\beta(1-\gamma+m\gamma)(2+3m\gamma)+G^2$ and $L \equiv -4+m+4\beta-7m\gamma+m^2\gamma+6m\beta\gamma$. Since $(2K+G)\sqrt{H} > 0$ and $(2K+G)^2H - (-H+2KL)^2 = (2K+G)\sqrt{H}$ $32m\beta^2(1+(m-1)\gamma))(2+3m\gamma)^3 > 0$, we have $d\alpha^*/d\beta > 0$. From (6) we have: $d\alpha^*/d\gamma = -m(2+m)(G-\sqrt{H})/(4(2+3m\gamma)K\sqrt{H})$. Since $G^2 - H = 16\beta(2+3m\gamma)^2 > 0$, we have $d\alpha^*/d\gamma < 0$.

Proposition 1(i) and (ii) are contrasting results. Proposition 1(ii) indicates that an increase in the foreign presence in the private competitor decreases the optimal degree of privatization. On the contrary, Proposition 1(i) indicates that an increase in the foreign presence in the partially privatized firm increases the optimal degree of privatization. This result indicates that if the main buyers of privatized firms are foreigners, the government should sell a larger share of the former public firm.

We explain the intuition behind Proposition 1(i). In the second stage, M has already been determined. In the first stage, the government chooses α considering how α affects M. This yields the difference of optimization problems between the first and the second stages. In other words, the time-inconsistency problem arises. Given M, firm 0 produces aggressively so as to reduce the rent of foreign stockholders. However, this aggressive behavior by firm 0 lowers π_0 and reduces the resulting M, thus, the government has an incentive for reducing this distortion. This time-inconsistency effect is greater when β is larger. Thus, the government has a greater incentive to increase α and commit firm 0 to a less aggressive action as β is larger.

Proposition 1(ii) is not unexpected. Similar effects are intensively discussed in the strategic international trade context. To reduce the rent of foreign competitors, the domestic government has an incentive for inducing aggressive competition. However, Proposition 1(i) is an original result in the literature of mixed oligopoly, and Proposition 1(ii) is also important as a benchmark highlighting the importance of Proposition 1(i). Although an increase in the presence of foreign enterprises in domestic product markets reduces the optimal degree of privatization, foreign presence in the capital market as buyers of partially privatized firm increases it. This result implies that an open market policy in capital markets and privatization policy can be complementary.

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