Tariffs, licensing and market structure

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Abstract

This paper challenges the conventional wisdom that exclusive owners of an advanced technology are always better off when producing as a monopolist than when competing against another firm. Competition against a less-efficient firm weakens the power that a host country can exert on the incumbent in the form of its tariff policy. We show that this gives a motive for a monopolist to license its technology to another foreign firm. A host country gains more from increased competition if it can induce the foreign incumbent to transfer technology to the host country firm. We show that the host country can do so by tariff commitment. We also discuss the implications of bargaining under licensing and Bertrand competition in the product market. Hence, this paper qualifies and extends the recent work of Kabiraj and Marjit [Protecting consumers through protection: The role of tariff-induced technology transfer. European Economic Review 47, 113–124].
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1. Introduction

Do restrictive trade policies always make the consumers worse-off? In a recent article Kabiraj and Marjit (2003) (henceforth, KM) show that the answer to this question is

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negative if trade policy affects firms' strategies such as technology licensing. In particular, they show that protection may make consumers better off if tariff protection induces technology licensing. The present paper extends this line of research and shows that a monopolist foreign firm finds it profitable to license its technology in presence of strategic trade policy. However, whether the foreign firm licenses its technology to a foreign firm or to a domestic firm is ambiguous and may depend on the nature of the domestic policy, i.e., whether the domestic country pre-commits or not to its trade policy.

If the monopolist licenses its technology to the potential *foreign* entrant and the host country sets its tariff after the licensing agreement, the host country's optimal tariff rate will decrease. But if it licenses the technology to the potential *host country* entrant, it gives the advantage of 'tariff jumping', irrespective of whether the host country sets its tariff before or after licensing. We find that, when the host country sets its tariff after licensing, the benefit for the monopolist may be higher if it licenses the technology to the foreign entrant. If the host country sets the tariff before licensing, the monopolist always licenses the technology to the host country entrant. We also show that commitment to the tariff rate by the domestic government increases domestic welfare as compared to no-commitment to the tariff rate.

Though our paper is closely related to KM, we differ from them in several important ways. Firstly, they consider technology licensing in a duopolistic market whereas we consider licensing by a monopolist foreign firm and a duopolistic market structure arises as an equilibrium outcome. Moreover, the effect of strategic trade policy on the licensing decision is much weaker in KM. In their model the foreign firm always licenses its technology (i.e., irrespective of the restrictive trade policy) if the variable cost of the domestic firm is up to 80% of the monopoly price, a condition that is quite likely to hold. As in our model the foreign firm would never license its technology under free trade, we show more clearly the effect of an active trade policy. Secondly, we consider contracts that allow for royalties and fixed fees instead of a fixed fee only. Surveys show that the combination of royalty and fixed fee licensing is most prevalent (Rostoker, 1984). Thirdly, we consider licensing not only to a domestic firm but also to a foreign firm and show when it is optimal to license the technology either to the domestic firm or to the foreign firm.

The remainder of the paper is organized as follows. The next section derives the basic model of a foreign monopolist. Section 3 considers licensing under no-commitment to the tariff rate while Section 4 considers commitment to the tariff rate. Section 5 discusses the implications of some alternative assumptions. In Section 6 we conclude.

2. Foreign monopoly

We assume that there is a foreign firm, called incumbent, who is the sole owner of a technology. The marginal cost of production is normalized to zero. Inverse market demand function is $p = a - q$ where the notations have usual meanings.

Consider a two-stage game where in the first stage the domestic government sets its tariff rate to maximize domestic welfare, and in the second stage the incumbent firm maximizes profit. Incumbent's profit when the domestic government imposes a uniform tariff of τ^m equals $\pi^m = q^m(a - q^m - \tau^m)$, where q^m stands for the monopoly output. Domestic welfare is equal to the summation of consumer surplus and tariff income. The consumer surplus in the domestic country equals $cs = \frac{1}{2}(q^m)^2$, while tariff income for the domestic government is $T = \tau q^m$. As usual, the game is solved backwards. Simple algebra yields an optimal tariff