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# How to maximize domestic benefits from foreign investments: the effect of irreversibility and uncertainty

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## Abstract

When a foreign monopolist facing uncertain future demand can either export to a host country or serve the market by undertaking an irreversible foreign direct investment, the host government maximizes net domestic benefits by nearly fully subsidizing the investment cost in combination with taxing away benefits that exceed the gains from exporting. Without the subsidy, maximization of domestic benefits leads to underinvestment from a world welfare point of view.

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## 1. Introduction

Host governments often lure foreign investors by large investment grants. Backward regions in Europe, for example, may use the EC's Structural Funds Program to cover up to 62% of the investment cost. Though literature shows that the

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optimal corporate tax rate in a small and open economy is zero when capital is mobile (Gordon, 1992), multinational firms are typically exposed to the corporate tax rate that prevails in the host country after having undertaken the investment. In a recent survey, Morisset and Pirnia (2000) find that Western-European countries rely more on incentives that reduce the fixed cost of investment than on incentives that reduce the effective corporate tax rate such as tax holidays. Even though the average statutory tax rate in the EU fell by more than 13 percentage points between 1985 and 1999 (Haufler, 2001), it is still 35.1%. A second policy that is not well understood is why governments provide subsidies to invest to foreign investors while taxing them at the same time. Hansson and Stuart (1989) explained this ‘taking with one hand and giving with the other’ as an equilibrium in a perfect foresight representative agent model where governments sequentially set tax policy in the period they are in power.

This paper argues that, even without any changes in government, it is optimal for the host government to provide a subsidy to investment in combination with a positive corporate tax rate under two fairly simple and reasonable assumptions: investment is irreversible<sup>1</sup> and subject to an uncertain payoff. The reason is that a subsidy to an investment that cannot be undone facilitates entry and enables obtaining post-entry tax revenues that exceed the cost of the subsidy. Whereas corporate taxation enlarges the barrier to entry faced by a foreign firm subject to uncertain demand and sunk entry cost, the subsidy reduces it and encourages investment. Profit taxation and subsidies have a different impact on the investment decision by the foreign firm and do not simply cancel out if their present values are equal because of the uncertainty effect. Corporate taxation leads to sharing of uncertainty surrounding future benefits with the host government, while an investment subsidy shifts part of the sunk cost completely from the foreign firm to the host government.<sup>2</sup>

In the extreme case of full subsidization of the cost of investment and taxing away all the benefits from foreign investment over exporting, the investment decision is entirely reversed. In that case, the firm would be indifferent between investing abroad and exporting. However, this combination of investment subsidy and corporate taxation is not optimal for the host government as it yields an investment rule for the firm that is not optimal from a welfare point of view. Investment would take place too rapidly since the value in waiting to invest is disregarded. The option effect of waiting, or from the downside perspective labeled by Bernanke (1982) as ‘the bad news principle’, should not only be considered by the firm, but also by the host government since tax income and corporate profit are positively correlated.

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<sup>1</sup>Complete irreversibility is not needed for the result in this paper. Abel and Eberly (1996) derived the option value of waiting when investment is reversible at some cost and showed that the uncertainty effect is large even with small cost of reversibility.

<sup>2</sup>The intuition of the result draws back to Pennings (2000), who shows that a profit tax and a lump-sum subsidy that generate the same expected tax income have a different effect on the incentive to invest. The analysis in that paper, however, looks at takes tax policy in a one-country framework where corporate tax taxation and investment subsidies merely shift rents between the firm and the government. Hence, optimal taxation is not analyzed.

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