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On capturing foreign oil rents☆

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ABSTRACT

A common assumption in the literature on tariff and exhaustible resources is that no stocks of the resource are available within the importing country's borders and therefore the importing country is not itself a producer. Reality is in fact quite different: there are many instances of countries that are simultaneously importers and producers of an exhaustible energy resource. This paper makes use of a spatial trade model that departs from this restriction and examines the rent-extracting tariff in a more general framework where the importing country is allowed to have access to a stock of the resource of its own and to determine simultaneously the optimal tariff and the rate of depletion of its own stock. Allowing the importing country to hold some resource deposits reduces the available rent to foreign producers and, in essence, reinforces the ability of the importer to capture the foreign rent. In effect, the optimal tariff is shown to be a decreasing function of the initial resource stock in the importing country. Interestingly, the paper identifies the spatial distribution of consumers as the primary reason of time-inconsistency.

1. Introduction

A special feature of nonrenewable resources is that they are in fixed supply and any unit consumed today will not be available in the future. So, suppliers will be willing to sell the resource only at a price that includes the opportunity cost associated with having less of the resource available for later sale.

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Therefore, there is some *economic rent* associated to the exploitation of nonrenewable resources.[1] In an international trading economy, all of the resource rent will accrue to countries that produce the resource. However, due to the fixed nature of total supply, consuming countries may have an incentive to capture some of the available rent by using a tariff. Hence, there is an ongoing battle for resource rents between exporting countries and importing countries. There is an abundant literature dealing with the strategic interaction among buyers and sellers in exhaustible resources market. This paper considers market power on the demand side (under the assumption of competitive sellers) and examines the optimal tariff when the importing country is also endowed with some resource deposits.[2]

The consideration of market power on the buyers' side has given rise to the literature on optimal tariff on exhaustible resources. Bergstrom (1982) shows that if resource extraction is costless, and consumer countries are constrained to choose only time-invariant tax rates, they can choose a tax rate sufficiently high to capture most of the rents. This result holds whether the resource is supplied competitively or by a monopoly that cannot discriminate. Brander Djajic (1983) discuss the case where the exporting country diverts supply to its own domestic use and observe that rent extraction is limited by the exporter's ability to use the resource domestically. Kemp and Long (1980), Karp (1984), Maskin and Newbery (1990) and Karp and Newbery (1991, 1992) address the issue of dynamic inconsistency and point out that open-loop tariffs are in general dynamically inconsistent; that is, the importing country would wish to change the originally announced tariff rate at some later time. More recently, Fujiwara and Long (2011, 2012) have examined the welfare implications of optimal tariffs on exhaustible resources.[3]

Apart from Bergstrom (1982), all of the above-mentioned contributions feature an important restriction. All of them assume either explicitly or implicitly that no stocks of the resource are available within the importing country's borders and therefore the importing country is not itself a producer.[4] For many exhaustible resources, and in particular energy resources such as oil and natural gas, such an assumption is inappropriate. Indeed, there are many instances of countries that are simultaneously importers and producers of energy resources: while the United States is the third largest oil producer in the world, with 7.6% of the world oil production, it is also the largest oil importer, with 27.4% of world oil imports. Similarly India ranked third in the world with 8.4% of the world coal production, while being the second largest importer of coal with 7.5% of the world imports (International Energy Agency, 2009).

This paper develops a spatial trade model to depart from the usual assumption and allow the importing country to have access to a stock of the resource of its own and to determine simultaneously the optimal tariff and the rate of depletion of its own stock. The purpose of the paper is then to investigate how a resource-importing country, endowed with some resource deposits, may capture foreign resource rents using a tariff. In other words, how does allowing the resource-importing country to hold some resource deposits alter the rent-extracting tariff?

Under the restriction of zero (or constant and identical) extraction costs, Bergstrom (1982) implicitly allows importing countries to also have their own resource stocks and accounts for the fact that countries can be simultaneously importers and producers of oil.[5] As noted perceptibly by Bergstrom,

[1] This rent, also known as Hotelling rent, or scarcity rent, is the difference between the marginal cost of producing (extracting) a nonrenewable resource and the market price charged.

[2] Many contributions to the theoretical analysis of nonrenewable resources have been devoted to the supply-side market structure and the issue of market power on the sellers' side has been widely addressed. See, for example, Salant (1976), Dasgupta and Heal (1979), Lewis and Schmalensee (1980), Loury (1986), Salo and Tahvonen (2001) and Groot et al. (2003). I assume price-taking suppliers for simplicity.

[3] A detailed analysis of intertemporal consistency issues in exhaustible resources can be found in Karp and Newbery (1993). Other papers that consider tariff on exhaustible resources include Tahvonen (1996), Liski and Tahvonen (2004) and Rubio (2011). Batabyal and Beladi (2006) analyze a tariff on renewable resources.

[4] Karp (1984) notes (p.77) that a serious abstraction in this literature is the assumption that the importer does not own any of the resource. He states that: "The most important generalization, however, would be to allow the buyers to own a stock of the resource, and to determine simultaneously the optimal tariff and consumption rate from his own stocks" (p.93).

[5] Though the analysis in this paper is applicable to any nonrenewable resource, oil will be frequently considered for convenience.