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Strategic tariffs, tariff jumping, and heterogeneous firms

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ABSTRACT

The majority of research to date investigating strategic tariffs in the presence of multinationals finds a knife-edge result where, in equilibrium, all foreign firms are either multinationals or exporters. Utilizing a model of heterogeneous firms, we find equilibria in which both pure exporters and multinationals coexist. We utilize this model to study the case of endogenously chosen tariffs. As is standard, Nash equilibrium tariffs are higher than the socially optimal tariffs. Unlike existing models with homogeneous firms, we find that non-cooperative tariffs promote the existence of low-productivity firms relative to the socially optimal tariffs. This highlights a new source of inefficiency from tariff competition not found in models of homogeneous firms. In addition, we find that in many cases the Nash equilibrium tariff when FDI is a potential firm structure is lower than when it is not. As a result, FDI improves welfare by mitigating tariff competition.

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1. Introduction

The strategic tariff literature stems as far back as Bickerdike (1906), which links a country's ability to increase welfare through a tariff to the elasticity of the foreign export supply. With the rise of foreign direct investment (FDI), recent literature has begun to examine the interaction between FDI and tariffs. One such interaction is through what has been coined 'tariff-jumping', which refers to a foreign firm investing (either through greenfield FDI or firm acquisition) in the host country to avoid protectionist barriers. There are two primary hypotheses for the motivation behind tariff-jumping; one anticipatory and the other reactional. The former is where a firm uses FDI as a *quid pro quo* for a lower future threat of protection and was formally introduced by Bhagwati (1987).[1] The latter, and what will be focused on here, is where a firm finds it more profitable to operate a foreign subsidiary in a host country in response to erected trade barriers by the importing country. In this paper we offer the first model of endogenously chosen tariffs where heterogeneous firms can choose between exporting and horizontal FDI as a foreign market entry mode using a variant of the Helpman et al. (2004) model that utilizes heterogeneous fixed costs ala Jørgensen and Schröder (2008).

A key consequence of firm heterogeneity is that in equilibrium, unilaterally chosen tariffs result in lower average firm productivity than found at the social planner's optimal tariffs. This highlights a new inefficiency resulting from tariff competition, one that does not exist in models with homogeneous firms. Furthermore, in many cases, when FDI is ruled out as a possible firm structure, these inefficiencies become larger. Therefore, allowing FDI improves welfare by its ability to

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[1] Blonigen and Feenstra (1997) find that the threat of protection had a substantial positive effect on greenfield FDI in the U.S. in the 1980s. Similarly, Blonigen and Figlio (1998) investigate the effect of FDI on U.S. legislators' votes on protectionist policies between 1985 and 1994 and finds that *quid pro quo* FDI has an effect, but not in a systematic way. For instance, legislators who were initially more protectionist in nature tended to increase trade restrictions, where legislators who took a more free trade stance were inclined to lower trade restrictions.

mitigate tariff competition.[2] In addition, we find that socially optimal tariffs and, for some parameterizations, Nash tariffs are negative. This is in contrast to most studies and arises because subsidizing imports from highly productive overseas firms drives low productivity domestic firms from the market. This effect is missing from the homogenous firm models of Helpman and Krugman (1989) and Broda et al. (2008) who find positive Nash tariffs.

Ellingsen and Wärneryd (1999) (EW) are the first to analyze the preferred level of protection in the presence of (or threat of) tariff-jumping. They find that domestic firms prefer a tariff just low enough to keep multinationals out of a host country. On the one hand, this result is useful in that it illustrates how domestic firms, contrary to intuition, do *not* want full protection. On the other hand, it provides a knife-edge result in which there is no FDI in equilibrium; i.e. there is no tariff-jumping.[3] Ludema (2002), who considers preferential trade agreements in an economic geography model where an exogenous number of firms choose FDI to avoid both tariffs and transport costs, also finds this knife-edge result for multinationals. However, this does not coincide with what is seen in the real world, where in many industries there are both multinational and exporting firms (see Haaland and Wooton, 1998; Blonigen and Ohno, 1998; Blonigen, 2002). This knife-edge result is a side-effect of assuming firms are homogeneous—an assumption abolished in our model.[4]

An alternative approach to that of EW is taken by Blanchard (2006) which assumes exogenous levels of FDI, eliminating the knife-edge.[5] However, Blanchard (2006) eliminates the endogenous choice of FDI and, thus, the tariff-jumping consideration is absent.[6] The cost of this assumption is not minor, as ignoring endogenous firm structure eliminates a major focus of the recent trade literature, an issue which is central to the work on heterogeneous firms. In contrast, our modeling of firm heterogeneity dulls the knife-edge result of EW, while still allowing for endogenous firm entry. Larch (2008) also considers endogenous FDI, however, he assumes an exogenously endowed specific factor used by exporters and multinationals that pins down the mass of varieties. Therefore, in his model the mass of varieties is invariant to the tariff, a structure which, although simplifying enough to yield tractability, eliminates one of the primary gains from trade in the New Trade theory—an increase in the mass of varieties. Further, in his model, unlike ours, all firms are either exporters or multinationals.

Since Melitz (2003) and Jean (2002), a great deal of attention has been given to introducing firms that differ in terms of productivity into trade models. This literature typically models heterogeneity in marginal costs, whereas like Jørgensen and Schröder (2008) we model fixed cost heterogeneity. While it is not our intent to imply that firms do not differ in marginal costs, we use fixed cost heterogeneity for two reasons. First, there is empirical justification (see Lawless and Whelan, 2008; Cole et al., 2009) for fixed cost heterogeneity. Second, this assumption aids a great deal in the tractability of our model. In any case, regardless of how heterogeneity is modeled, trade restrictions are usually exogenously given symmetric iceberg transport costs and little is done with regards to endogenous trade policy. To our knowledge, no one has studied either socially optimal or strategic tariffs in the presence of both heterogeneous firms and the endogenous choice to become a multinational. While Helpman et al. (2004) provide a model with heterogeneous firms and the option to become a multinational, their focus is not on endogenous trade policy. Instead they focus on industry composition and productivity as a result of symmetric trade restrictions (modeled by iceberg transport costs). Jørgensen and Schröder (2006) investigate the welfare effects of a tariff in a Melitz (2003) type model. However, in their model, tariffs are symmetric and exogenous. Though their model describes some interesting welfare effects, it does not characterize the unilateral strategy of a particular country and therefore cannot discuss the welfare implications of tariff competition. Demidova and Rodríguez-Clare (2009) use a Melitz-type model and a small country assumption to show the first best outcome can be achieved through either a consumption subsidy, export tax, or an import tariff. Nevertheless, neither Jørgensen and Schröder (2006) nor Demidova and Rodríguez-Clare (2009) allow for the possibility of FDI.

It is interesting that there is such limited theoretical work on strategic trade policy in which both exporters and multinationals are present in equilibrium, given the empirical evidence of its existence. Exceptions to this include Blonigen and Ohno (1998), who provide a partial equilibrium Cournot model where firms have differing (expected) costs of FDI. In this model, foreign firms who establish a significant production presence try to increase trade barriers in the home country. The authors provide case studies of U.S. antidumping cases in tapered roller bearings and color picture tubes and the escape clause investigation of Japanese autos for empirical evidence. Nevertheless, filling this gap in the theory is critical as it lays the necessary foundation for studying non-cooperative trade policy, the formulation of trade agreements, and the many impacts of international trade policy.

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[2] This is similar to Blanchard (2007) who considers vertical FDI rather than horizontal FDI.

[3] EW does characterize an equilibrium with FDI under uncertainty.

[4] Another departure from EW is the social welfare function we use. EW cite the literature on the political economy of protection, such as Hillman (1989) and Rodrik (1995), and utilize a welfare function that reflects the preferences of small, but strong, interest groups—hence they maximize domestic firm profits. Blonigen et al. (2004) empirically investigate the effect of U.S. antidumping decisions on domestic firm profits and find that when tariff-jumping FDI occurs, the profit gains from the trade barrier are at least partially mitigated. Though domestic firm profits are an important welfare consideration (particularly in a political economy framework), we take a more classical approach and treat profits as a source of income for a representative consumer and the indirect utility of which policy makers seek to maximize.

[5] Technically, FDI in Blanchard (2006) is modeled as passive claims on foreign output and not majority ownership of a firm. However, given the perfect competition assumption of her model, the two definitions can be interpreted identically.

[6] Blanchard (2007) allows for endogenous FDI, though in the form of vertical FDI. The rate of return on foreign investment in the Foreign export sector is a function of Home's tariff, providing another domestic cost to a tariff thereby lowering Home's Nash tariff. This is obviously a different channel than what is discussed in our paper.