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Trade liberalization, outsourcing, and the hold-up problem☆

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Abstract

This paper shows that, in a bilateral relationship where a foreign supplier has to make a relationship-specific investment but cannot enforce a complete contract, the standard hold-up problem of underinvestment is aggravated when trade incurs a tariff. In this context, we identify two new channels through which trade liberalization enhances international trade. First, lower tariffs increase the incentives of foreign suppliers to undertake cost-reducing investments. Second, lower tariffs may prompt vertical multinational integration. These indirect effects imply that responses of trade volumes to trade liberalization are greater than standard trade models suggest and help explain current trends toward foreign outsourcing and intra-firm trade.

Keywords: International trade; Outsourcing; Hold-up problem; Vertical integration; Investment effect

JEL classification: F13; F23; L22; D23

1. Introduction

World trade has increased significantly in the last fifty years. The conventional view is that this trend results from the systematic reductions in trade barriers during the same period. However, trade barriers have fallen at a much lower pace than trade flows have increased. It is therefore not surprising that conventional trade models can explain only part of the increase in trade flows (Baier and Bergstrand, 2001). Feenstra (1998) suggests that foreign outsourcing may explain the remaining fraction. When goods cross national borders multiple times in the production process, the effects of a

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reduction in tariffs on the cost of production of those goods — and thus on the volume of trade — are magnified. Yi (2003) formalizes this reasoning with a dynamic Ricardian model that incorporates the possibility of vertical specialization (defined as production processes in which an exported final good uses imported inputs). Calibrating the model, Yi confirms the importance of vertical specialization in explaining the response of trade flows to trade liberalization. Still, even his model can account for just about half of the growth in trade between 1962 and 1999.[2]

In this paper, we identify additional mechanisms through which trade liberalization affects trade volumes. We begin by arguing that specific assets and incomplete contracts constrain the level of international trade in intermediate goods, then show that trade liberalization loosens that constraint. First, we establish that high tariffs make international outsourcing unattractive not only because of the conventional price effects on which Yi and others concentrate, but because firms have limited incentives to carry out transnational relationship-specific investments.

As tariffs fall, then, we expect to see separate, positive "price" and "investment" effects on trade flows. Second, if lower tariffs prompt vertical integration between domestic buyers and foreign suppliers, the incentives to invest improve further. Thus, there is also a potentially positive "integration" effect on trade flows. The investment and integration effects provide a new rationale for why conventional trade models consistently underestimate the responsiveness of trade flows to trade liberalization.

We make these points using the canonical model of the hold-up problem of underinvestment,[3] with only a few adjustments to adapt it to an international context. A domestic downstream firm and a foreign upstream firm bargain under symmetric information over the terms of trade of a specialized component. Efficiency in the bargaining process ensures *ex post* efficiency in production, but contract incompleteness implies that *ex ante* relationship-specific investments undertaken by the upstream firm will generally be inefficient. We add two dimensions to this basic setting. First, to capture a "foreign *vs.* home" outsourcing decision, we do not impose a pure bilateral monopoly; rather, we allow the downstream firm to purchase either the specialized component from the foreign supplier or a standardized version from a competitive domestic market, while assuming that the buyer cannot commit to buy from one or the other. Second, we assume that the downstream firm pays a tariff if it buys from the foreign supplier.

Despite this simple structure, the model yields entirely novel predictions about how trade costs affect outsourcing, investment and integration decisions, as well as trade flows. These results are consistent with several sets of stylized facts. We find, first, that trade flows tend to be more sensitive to trade costs than conventional trade models indicate, thus helping us to understand the trade flows "puzzle" mentioned above. Second, we find that the responses of trade flows to lower trade costs in bilateral relationships have discontinuities that, when aggregated, would tend to display a non-linear pattern similar to that described by Yi (2003). Our model is consistent also with the work of Hummels, Ishii and Yi (2001), who find that vertical specialization accounts for about one-third of the increase in world trade between 1970 and 1990, and with that of Hanson, Mataloni and Slaughter (2005), who find that trade in intermediate goods within multinational firms is highly sensitive to trade costs. Finally, when trade liberalization prompts vertical integration in our model, investment and trade respond with an unambiguously positive, discrete jump. This result is supported by the empirical results of Arnold and Javorcik (2005), who identify a tendency of acquired foreign upstream firms to experience a permanent surge in productivity and investment upon acquisition.

Situations creating hold-up problems arise in a variety of contexts, but are likely to be particularly common in international transactions involving intermediate goods. The hold-up literature has focused on situations where either complete contracts cannot be written or investment specifications are not verifiable. In some circumstances, firms may alleviate such problems by reassigning property rights,[4] and empirical research has identified situations where firms have vertically integrated to lessen hold-up problems.[5] Several authors have recognized also theoretical situations

[2] In an intra-industry model with firm heterogeneity à la Melitz (2003), Chaney (2005) shows that trade liberalization causes a "productivity overshooting" where the most productive firms get larger while the least productive firms stop production in the short run. Since the firms that export are those with high productivity, this causes a short-run "trade overshooting" as well. Hence, Chaney finds a magnified elasticity of trade flows to trade barriers, too, but one that takes place during the adjustment period toward the new trade steady state, and which arises because of intra-industry heterogeneity and selection into exporting.

[3] See, *e.g.*, Tirole (1988).

[4] See, *e.g.*, Grossman and Hart (1986) and Hart and Moore (1990).

[5] See, *e.g.*, Klein, Crawford and Alchian (1978) and Monteverde and Teece (1982).