

# A Note on Intra-Industry Trade

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In order to explain intra-industry trade in a homogeneous commodity, the existence of transportation, storage, or selling costs is normally assumed. (See Grubel and Lloyd, 1975, ch. 5).<sup>1</sup> Indeed, Lancaster (1980) suggests that "entrepot trade and locational effects between large adjacent countries [are] the only cases in which exports and imports can consist of *absolutely* identical commodities." However, in this note a theory of intra-industry trade in a homogeneous commodity is set forth in which none of the above assumptions are made. We find that a country can simultaneously export and import a homogeneous commodity when its production is controlled by a domestic monopolist and the country imposes a quota on imports of it.

Consider an economy in which a domestic monopolist controls the production of a homogeneous commodity, good X. In Figure 1,  $D_x$  represents the domestic demand for good X;  $MC_x$  represents the monopolist's marginal cost function; and  $P_x$  is the world price of good X. In the absence of trade impediments, i.e., transportation costs or trade barriers, the domestic monopolist is unable to exert any monopoly power. He produces  $Q_3$  units and sells these units domestically at price  $P_x$ . The economy consumes  $Q_5$  units, with  $Q_3Q_5$  units being imported.

Assume that a quota of  $Q_4Q_5$  units is now imposed upon imports of good X. Licenses to

import these  $Q_4Q_5$  units are assumed to be allocated among citizens so that no license-holder possesses monopoly power in the importation of good X. Since the quota sets an upward limit on the imports of good X, the domestic demand confronting the monopolist is represented by  $D_x^q$ , where  $D_x^q$  lies left of  $D_x$  at any given price by  $Q_4Q_5$  units.

Following Corden (1971), we term  $D_x^q$  as the "quota-distorted demand curve" corresponding to the quota of  $Q_4Q_5$  units. The  $Q_4Q_5$  quota-distorted marginal revenue curve is represented by  $MR_x^q$ .

In this situation the monopolist will maximize profits by engaging in price discrimination and will determine output and prices by setting  $MR_x^q = P_x = MC_x$ . Although the monopolist continues to produce  $Q_3$  units, he now sells to domestic consumers  $Q_1$  units at price  $P_x^q$  and exports  $Q_1Q_3$  units at price  $P_x$ . On the other hand, domestic consumption is equal to  $Q_2$  units, which consists of the  $Q_1$  units purchased from the monopolist plus the  $Q_1Q_2$  ( $=Q_4Q_5$ ) units imported. At the same time that the monopolist is exporting good X, license-holders are importing good X to be sold to domestic consumers.<sup>2</sup> The country simultaneously exports and imports this homogeneous commodity.<sup>3,4</sup>

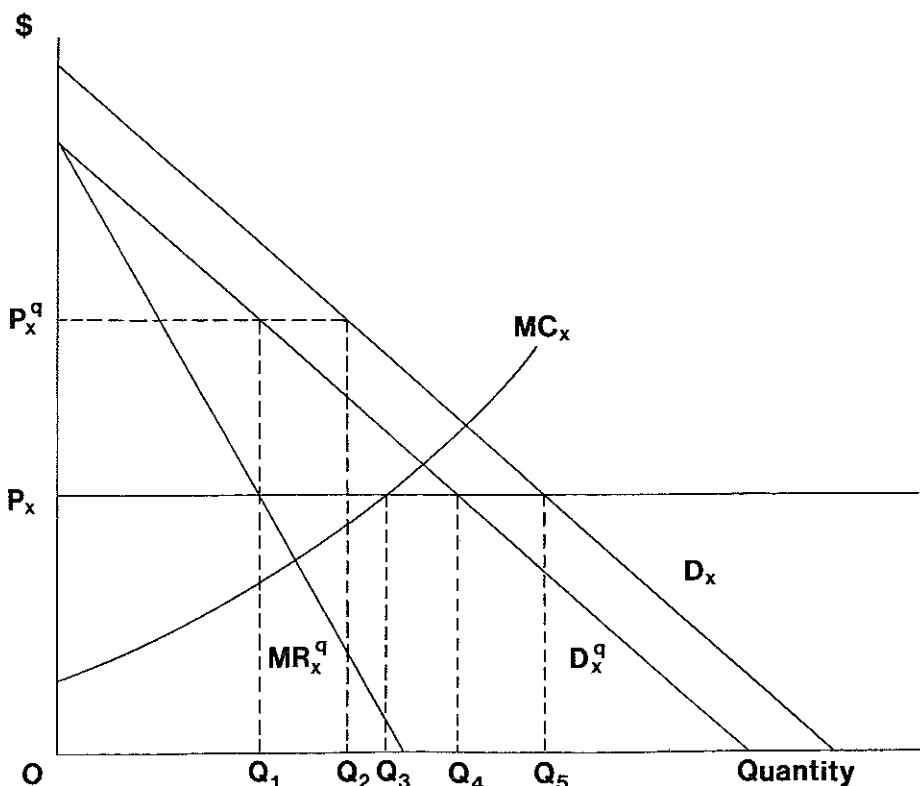
<sup>2</sup>Receipts to license-holders equal  $(P_x^q P_x) \times (Q_1 Q_2)$ .

<sup>3</sup>The following empirical example may be relevant here. For all practical purposes, the domestic tractor industry in India can be viewed as a monopoly. Imports of tractors into India were maintained at more or less free trade levels until 1973. In 1973, the government decided to ban all imports other than those coming under the World Bank assistance scheme. Thus, effectively, a quota was imposed on tractor imports. As a result, during the three years 1974-75 to 1976-77, India exported tractors at the same time that it was importing them. Interestingly

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The author thanks an anonymous referee for helpful comments.

<sup>1</sup>For additional discussion of intra-industry trade, see Davies (1977, 1978), Finger (1975, 1978), and Gray (1973, 1977).



Two aspects of this analysis should be noted. First, Figure 1 is drawn to represent the economy as a net exporter of good X after the imposition of the quota, i.e.,  $Q_1Q_3$  is greater than  $Q_1Q_2$ . However, this need not be the case; the economy could just as easily be a net importer of good X or even have exports equal to imports. Second, it is possible that intra-industry trade will not take place here. For

example, if the quota-distorted marginal revenue curve intersects  $MC_x$  before intersecting the  $P_x$  line, the economy will import good X but the monopolist will not find it profitable to export.

One additional feature of this analysis is that it adds yet another example to the literature on the nonequivalence of tariffs and quotas.<sup>5</sup> Observe that a sufficiently high tariff imposed on imports will permit the monopolist to price discriminate in the same manner as the quota. However, at the very least, the tariff must be prohibitive. Hence, the tariff here cannot lead to two-way trade as does the quota.

<sup>5</sup>Contributions to this literature include Bhagwati (1965, 1968), McCulloch (1973), Shibata (1968), and Sweeney, Tower and Willett (1977).

enough, the domestic price of tractors during these years was considerably higher than the world price. (See *Economic and Political Weekly*, April 5, 1980, pp. 660-661.)

<sup>4</sup>Corden (1971, ch. 9) also investigates the case of a domestic monopolist controlling a country's import-competing industry where imports are constrained by a quota. He analyzes simple monopoly behavior in this context, but does not consider the monopolist engaging in price discrimination.

Finally, the simultaneous export and import of a homogeneous commodity could also take place in the economy's free trade export industry. As in the previous case, a single domestic producer in a small economy cannot exercise monopoly power in free trade. If the quota is introduced,<sup>6</sup> the domestic market net of the quota becomes insulated from foreign competition and the domestic monopolist faces two markets with different elasticities, the insulated domestic and the foreign (perfectly price elastic). The monopolist will equate  $MC$  to  $MR_f (=P_f)$  and  $MR_d (<P_d)$ . At the same time the monopolist is exporting this commodity, the economy will also be importing the good.

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<sup>6</sup>Why would a quota exist on imports of a commodity that the country exports under free trade and where imports are nonexistent? Perhaps the quota was levied when the country was importing the commodity and, for various bureaucratic reasons, had not been lifted subsequent to the change in comparative advantage.