Host Country Welfare Effects of Foreign Direct Investment (FDI) and Imports: An Application to the Processed Food Industry

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1 Introduction

It is generally accepted in the trade literature that foreign direct investment (FDI) is encouraged by forces restricting trade. Therefore, it is possible to characterize exports and FDI as alternative means of entering foreign markets (Caves, 1996). For example, it is known that real investment responds to the host country effective tax rates on FDI and tariff rates on imports (Grubert and Mutti, 1991). However, in the case of such a tariff-induced capital inflow, growth might be immiserizing, if the host country is *small* and remains incompletely specialized, and if the foreign investment is insufficient to eliminate imports of the capital-intensive good (Bhagwati, 1973). Governments in host countries with tariffs as trade barriers tend to impose high rates of taxation on foreign investment, unless they have some other justification to have high levels of inward FDI, such as wage effects, or the transfer of new technologies.

This potential loss of welfare in the host country is due to three contributing effects: (i) the loss due to tariff-created distortions in consumption and production; (ii) the loss or gain that would result from accumulation of nationally owned capital in the presence of the tariff; and (iii) the loss which arises when foreign profits are fully appropriated by the investing company, i.e., foreign profits are subtracted to determine national income, assuming that foreign capital appropriates all of its marginal product (Brecher and Diaz-

Alejandro, 1977). The only way to ensure that the summation of the last two effects is positive, i.e., that the growth is not immiserizing, is through the taxation of profits of the investing company (Bhagwati, 1973). In other words, if the trade barrier is in the form of a tariff, the rate of return in the protected industry will increase, causing increased profits enjoyed by the foreign firms located there. Unless these artificially high profits are taxed by the host country, the full appropriation of them by the foreign company could be harmful to that economy (Feenstra, 1997).

In contrast, when the only distortion is in the form of a constant quantity constraint, immiserizing growth is ruled out since the fixed quota prevents the constrained quantity variable from falling any further below the optimum. Thus, in the presence of a quota, growth is always beneficial (Anam, 1982). Briefly, international capital mobility raises the welfare cost of tariff protection, whereas it reduces the welfare cost of quantitative restrictions (Neary, 1988).

On the theoretical side, welfare effects of tariff- or quota-jumping FDI have been analyzed graphically by Johnson (1967), Brecher and Diaz-Alejandro (1977), and Anam (1982), and analytically by Bhagwati (1958), to name but a few. However, on the empirical side, this problem has not been explored in detail.

Another important issue is the optimal combination of import tariffs and tax rates on inward-FDI profits in a particular industry. Brecher and Feenstra (1983) investigated the theoretical effects of import tariffs and foreign investment taxes on the international allocation of capital. They found that the actual signs of optimal tariffs and taxes were both positive.

In this paper, we will empirically estimate the welfare effects of tariff-jumping FDI with a focus on food processing industry. In the course of this estimation, our main emphasis will be on the second and third contributing effects defined by Brecher and Diaz-Alejandro (1977). In the food processing industry, sales through foreign affiliates have increased more rapidly than exports. In addition, FDI has become the dominant form of international trade in processed foods (Bredahl, Abbott and Reed, 1995). Food manufacturing has consistently ranked among the top industries that are characterized by FDI. Therefore, most of the relevant empirical studies consider the role of the processed food industry.[1] Accordingly, this paper will present an empirical analysis using food processing industry data from Turkey at the firm level for 1980-1999 time period.

The paper is organized as follows: in Section 2, an analytical model consistent with the above argument is derived. Our data and the methodology used in the analysis will be described in Section 3. Last section is devoted to further remarks and conclusion.

2 The Model

In this section, a model is developed to enable the investigation of the effects of import tariffs and foreign investment taxes on the international allocation of capital. Moreover,

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[1] For instance, see Connor (1983); Pagoulatos (1983); Handy and MacDonald (1989); Henderson, Vörös and Hirschberg (1996); Reed (1996); Reed and Ning (1996); Henderson, Handy and Neff (1996); Henneberry (1997); Pick et al. (1998); and Bolling, Neff and Handy (1998).

the optimal signs of a combination of import tariffs and taxes on foreign investment are examined.

Suppose the host country produces two commodities using two factors (capital and labor). Assume that the economy has fixed endowments of both inputs, which are perfectly mobile between domestic industries. Producers and consumers maximize profits and utility, respectively, while perfect competition prevails everywhere. Moreover, no restrictions are placed on the economy's production structure.

Whereas labor cannot move internationally, suppose that capital is freely mobile between countries. Good 2 serves as the numeraire with a nominal price identical to unity throughout the world. The host country aims towards maximizing national welfare which is defined as an indirect utility function, but at the macro level, i.e., the total utility will be a function of prices and income. Total income is defined as the total value of the production in the country plus the revenue obtained from import tariffs and taxation on foreign investment profits. Hence, at foreign relative price p^*, import tariff rate t, rate of tax on foreign investment profits τ, and the rental rate of capital in terms of the second commodity within the host country r, the objective is to maximize the indirect utility function measuring the welfare of a representative customer, i.e.,

$$\max u = V\left[p^*(1+t), I\right] \tag{1}$$

where $I = p^*(1+t)y_1 + y_2 + tp^*(c_1 - y_1) - (1-\tau)rK_f$. Here, y_1 is the capital-intensive importable good and is defined as $y_1 = y_1(p^*(1+t), \overline{K} + K_f, \overline{L})$, y_2 is the labor-intensive

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exportable good and is defined as $y_2 = y_2(p^*(1+t), \overline{K} + K_f, \overline{L})$, and K_f is the total capital transferred from the domestic economy to the host country and is defined as $K_f = K_f(t, \tau; r)$. $\overline{K}$ and $\overline{L}$ are the fixed capital and labor endowments, respectively, and c_1 represents the total amount of good 1 consumed in the host country.

The income term in the objective function needs some further explanation. The first two terms represent the value of the total production of the two goods in the economy. The third term is the total revenue from import tariffs. The difference between the total demand (consumption in this case) and the amount that is actually produced in the host economy gives the total amount of good 1 that is imported at the international price, p^*. The total tariff revenue earned by the host country government is calculated by multiplying the total value of imports by the ongoing tariff rate, t. The fourth term shows the return on capital. This expression is subtracted from the total income, since we assume that the investing company appropriates all (i.e., the case in which $\tau = 0$) or part of this return (i.e., the case in which $\tau > 0$). Hence, the amount appropriated by the foreign company is not part of the domestic production, and it must *not* be calculated as part of the national income.

Subtracting the payments to foreign capital from GNP to obtain domestic factor income, we obtain $I = r\overline{K} + w\overline{L} + tp^*(c_1 - y_1) + \tau r K_f$, where r is the rate of return on labor (or wage rate). Hence, the objective function becomes

$$\max u = V\left[p^*(1+t), r\overline{K} + w\overline{L} + tp^*(c_1 - y_1) + \tau r K_f \right]. \tag{2}$$

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Taking the total derivative of the objective function with respect to K_f, we obtain

$$\frac{du}{dK_f} = \frac{dV}{dI}\left(tp^*\left[\frac{dc_1}{dK_f} - \frac{dy_1}{dK_f} \right] + \tau r \right).$$

(3)

Since c_1 is a function of prices and income,

$$\frac{dc_1}{dK_f} = \frac{dc_1}{dI}\left(tp^*\left[\frac{dc_1}{dK_f} - \frac{dy_1}{dK_f} \right] + \tau r \right).$$

(4)

Extracting the expression dc_1/dK_f from (4), and substituting in (3), we obtain

$$\frac{1}{V_I}\frac{du}{dK_f} = tp^*\left(\frac{\tau r\dfrac{dc_1}{dI} - \dfrac{dy_1}{dK_f}}{1 - tp^*\dfrac{dc_1}{dI}} \right) + \tau r$$

(5)

where $V_I = dV/dI$. Note that for $t = \tau = 0$, $du/dK_f = 0$. Economically, if the foreign

company transfers all of its profits to the source country without paying any tax to the

host country government and if the tariff on imports is zero, a capital inflow will not

change the welfare in the host country.

The second step in the tariff case is the calculation of a change in the national welfare

with respect to a change in the tariff rate. Assuming that K_f responds to the host country

rate of return, r, and assuming further that $\tau = 0$,

$$\frac{du}{dt} = \left.\frac{\partial V}{\partial t}\right|_{K_f \text{ fixed}} + \frac{\partial V}{\partial K_f}\cdot\frac{\partial K_f}{\partial r}\cdot\frac{\partial r}{\partial t}$$

(6)

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Evaluating this term at $t = 0$, it is obvious that $du / dt = 0$, since the first term on the right-hand side is zero[2], and $\partial V / \partial K_f = 0$ from the above argument. Since $du / dt = 0$, then the optimal tariff rate for maximizing the national welfare must be equal to zero.

If the host country government starts imposing a tax on the foreign investment profits, this would chase some of the FDI away, since the host market production would be a less profitable activity for the investing company. In this case, the company might prefer to focus on exports rather than FDI to penetrate the host market. In order to re-attract that capital, it might be a good idea to impose a positive tariff rate on imports, given the assumption that the FDI is tariff-jumping. Hence, for strictly positive rates of taxation on FDI profits, the optimal tariff rate is also strictly positive.

In equation (5), the right-hand side term, $tp^* dy_1 / dK_f$, is critical to our analysis. An increase in the capital inflow to the host country will result in an increase in the domestic production of the good 1, which uses capital intensively, i.e., $dy_1 / dK_f > 0$. Furthermore, the derivative term will yield how much this increase will be with respect to a unit of change in capital inflow. If same amount of good 1 is consumed still, even after the increase in capital, the increase in the production of good 1 in the host country will

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[2] For the small country case, the optimal tariff rate so as to maximize the national welfare is zero, since there is no effect on the world prices.

decrease the imports of that good by an equal amount.[3] Then, the whole term quantifies

the loss of import tariff revenue, due to this reduction in imports. It is technically

possible to measure the magnitude of this term by making use of the ongoing customs

tariff rates, as well as the prices of the products that are imported and change in total

imports due to the increase in host country production of the good.

3   Data and Methodology

A crucial assumption underlying the argument above is a *small* host country, which

remains incompletely specialized. This restrains the research to a case in which the host

country markets have no significant effect on world prices.

The foreign investment data for empirical analysis come from food processing

industry of Turkey for 1980-1999 time period. The import data for the same period were

obtained from the *State Institute of Statistics, Republic of Turkey* and import tariff rates

were provided by the *Foreign Trade Under-secretariat, Republic of Turkey*. All the trend

variables and national income accounting data were taken from the *International*

Financial Statistics by the *International Monetary Fund*. The FDI data consist of 127

firms in the food-processing sector, which entered the Turkish market since January

1980. Other information in the data set includes the country origins of the firms, location

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[3] This result assumes that the production increase due to the capital inflow to the host country substitutes

imports, after Mundell (1957).

within Turkey where the plant has established, the Turkish counter-parts of the foreign investors, as well as each partner's share in this joint venture.

The relationship between FDI and trade is based on the level of data aggregation, to some extent. Aggregate data may mask identification of the substitution effects and exaggerate the complementarity effect (Blonigen, 1997). Using data at the firm level enables us to make our analysis without having this problem as strong as with a data set at a more aggregate product level.[4]

Our methodology includes several steps. The first major step is the conduct of a test for investigating the substitute and complementary relation between FDI and trade. Since this is a paper topic in itself, this analysis has been left to another study, which is actually the predecessor of this paper. Based on a substitute relation, the second step includes measuring the welfare effect of the tariff-jumping FDI in the host country. In this stage of the study, the term extracted from Equation (5), namely, $tp^* \, dy_1 / dK_f$ is calculated. As discussed above, this term represents the foregone import tariff revenue due to domestic production by the foreign investor substituting for imports.

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[4] For a detailed discussion of substitution and complementary relations between FDI and trade, as well as substitution being masked by data aggregation, see Blonigen (1997).

4 Conclusion and Further Remarks

There is a need to improve our understanding of the relation between trade phenomena and the globalization of economies through international capital flows. There are still many unanswered questions in the FDI and trade literature.

For the small country case, trade theory tells us that governments in host countries with trade barriers in the form of a tariff have to impose strictly positive rates of taxation on foreign investment, in order not to have immiserizing growth. This is mainly for compensating the foregone import tariff revenue, which is a welfare loss to the host country, in addition to the well-known welfare losses due to trade barriers. This welfare loss is measurable and this paper suggests a methodology on how to measure this loss approximately, based on the graphical and analytical analyses of Bhagwati (1958) and Johnson (1967). The main emphasis is on the food processing industry and the analysis uses data from Turkey for 1980-1999 time period.

Even though the theory tells us that positive tariff rates must be accompanied by positive taxation on FDI profits, some countries in the liberalization phase try to further attract foreign investment by certain incentives, i.e., negative taxation. In this case, these governments must have some other justification to allure more inward FDI to their countries.

Firstly, inward FDI creates new employment opportunities. A significant number of studies support the idea that multinational enterprises pay higher wages than their host

country competitors (Caves, 1996).[5] Therefore, one possible direction for further research might be the extension of our model so as to allow investigation of possible wage and employment effects of FDI in the host country labor markets. Most countries have reliable manufacturing statistics, so it is possible to gather information on wage and employment figures for most sectors, to examine such effects.

Secondly, foreign investment is welcome for possible technology transfers from the source country to the host country. Some countries even prefer the burden of much higher costs of procuring a product from a domestic company established by a foreign investor to importing these products from low-cost producing countries. This evidence, conflicting the traditional trade theory, finds some support from those who consider technological spillovers. In this respect, a second direction for further research includes the examination of positive technological effects to the host country production sectors from the source country of foreign investment.

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[5] Empirical evidence shows growing wage inequality between skilled and unskilled workers during the 1980s, particularly in the developed countries. This is also true for low-wage trading partners of the United States, but there are few empirical studies on developing countries. Possible explanations for growing wage inequality include the increased demand for skilled labor due to: (i) the advent of more technology-oriented production techniques, and (ii) the increased import competition from low-wage countries shifting resources towards industries that use skilled labor relatively intensively (Feenstra and Hanson, 1997, p. 372). Another explanation by Feenstra and Hanson (1996) is the increased demand for skilled labor due to advanced country FDI in less developed countries.

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