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Original Article

International Trade and Multinational Investment Theory of the Firm

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ABSTRACT

This study developed the international trade and multinational investment theory of a firm. It examined the effects of export taxes and transport costs in attracting foreign direct investment. The study answered the following question: when is it profitable for a multinational to locate one of its affiliates in a particular host country to trade in that market in lieu of exporting the product to that country after producing it in the home country? In this study, multinationals locate themselves in developing countries to compete in an oligopolistic market and the host countries compete to attract them. The model predicts: (a) a negative effect of transport costs on the number of multinationals entering developing countries, (b) a negative effect of export taxes on the number of multinationals entering developing countries, and (c) a negative effect on the interaction between transport costs and export taxes on the number of multinationals entering developing countries.

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INTRODUCTION

The global economy is increasingly merging into one complex "village" driven by gains in the removal of barriers to trade and investment and the advances in transport and communication. Consequently, developing countries are competing ferociously for foreign investments by multinational corporations (MNCs). In the last two decades or so, considerable theoretical and empirical literature has emerged on foreign direct investment (FDI) competition with host developing countries employing tax tools to entice foreign investment. In the majority of this literature, foreign investment is of the portfolio sort and is not FDI (Helpman, 1984).

Numerous motives explain MNCs' strategic location decision to move some of their affiliates to developing countries. In Vernon's (1966) stage three (standardized product stage), rivalry emanating from other multinationals selling identical commodities pressures a multinational to lower prices so as to maintain sales levels. As the world market gets more sensitive to prices, multinationals start looking belligerently for locations that are cheaper in developing economies. These locations are then used to supply the fast-growing world market. Most production at this phase occurs outside the innovating mother nation. Subsequently, demand in this innovative nation is supplied by imports from lower costs developing economies. According to Vernon (1966), the entire production process might even relocate to other countries altogether, see also Casson and Pearce (1987).

From the perspective of a host of developing economies, various initiatives drive the urge to want to encourage MNCs to decide in their favour. There is a static effect of incoming FDI on the production structure of the economy. This emanates from the fact that specialization will closely trail comparative advantage. Consequently, according to Morrow (2010), the sector using comparatively more the intensively abundant factor will experience relative growth. Literally, this gives incentives to developing economies to enlarge production that is intensive on labour in lieu of modern capital-intensive production. The result is the expansion of the "backbone" of the economy, customary agriculture, that are labour-intensive. In this instance, multinationals clearly provide an opening for surplus to the larger and richer developed world that allows developing economies to grow. In this sense, MNCs encourage employment and support, setting upward pressure on wages, especially in traditional sectors which have stagnated for decades. There is only a slight indication, however, that multinationals are associated with seen differences in endowments of factors of production in economies (Brainard, 1993b) or even the variations seen in the earned return to capital. Nevertheless, supports exist that diversification to lower risks and tax avoidance bring clear reasons for FDI inflows to developing nations (Morck & Yeung, 1991; Wheeler & Mody, 1992). Ostensibly, many multinationals have a tendency to select firstly a location for their production and then order their responsible departments to reduce tax given that location.

A developing host country would like MNCs to offer a good to their citizens at a reasonable (decreased) price that domestic firms cannot offer. Besides the static gains, economists have widely discussed the dynamic effect of MNCs that are vital to a developing country's economic development (Casson & Pearce, 1987). These include developing economies' ability to get foreign capital and technology. Furthermore, Tang and Zhang (2021) confirmed the existence of intrinsic welfare gains from increased social contact with other nations and cultures that could assist in breaking down the chains of tradition, change wants radically, and encourage entrepreneurship, invention, and innovation. Through the acquisition of comparative advantages, MNCs can help raise the growth and development of infant industries into globally competitive ones. This is probable by linking them

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to larger and richer markets overseas and providing them with exposure to better product developments (Ethier & Horn, 1990; Hillman & Markusen, 1987; Dixit, 1984).

There are various justifications why a nation may deject multinationals. Economists have noted that specialization in the manufacturing of commodities that have barely any connection to the wider economy may cause an askew pattern of development, the consequence of which contradicts the reason behind attracting FDI. Consequently, MNCs can have a harmful impact on competing indigenous firms (Chair *et al.,* (2022). From the debate above, a number of points stand out. These are: (i) for policy purposes, host developing countries need to balance the costs vis-à-vis benefits of FDI in formulating appropriate and effective policies, (ii) to benefit from FDI, the host developing countries need to make use of tax instruments such as export taxes and non-tax instruments like the development of an efficient transport network to enhance benefits from MNCs.

Transport Costs

Logistics is the process of managing the physical movement of commodities from where they are produced as raw materials to the final consumers as finished goods. In fact, logistics link manufacturing activities to those activities required to transport goods to the buyers. It involves all kinds of delivery, storage services, and transportation. Transport costs of raw materials and final commodities impact any choice concerning where MNCs will establish production facilities. Transporting some products through the manufacturing and distribution processes is very expensive, whereas it's cheaper to transport others. Transport costs are among various forces impacting globalization (Ethier & Horn, 1990; Donnenfeld & Weber, 2000).

Transport costs of goods affect comparative prices as goods move from one country's location to another. Ultimately, the rate of cost of transport will be determined by the elasticities of the demand and the supply in each nation. As supply and demand get more inelastic as the good is imported to the MNC's mother nation and the more elastic supply and demand become in exporting from the host developing economy, the higher the relative costs of transport are paid by the importing mother nation of the MNC. According to Chakravorty and Mazumdar (2008), the more inelastic conditions in the marketplace get in MNCs' host nation and the more elastic in the multinationals' importing developed nation, the higher the cost of transport that is borne by the host exporting developing economy.

The costs related to transporting commodities globally have been experiencing changes recently as a result of new technologies in transportation and the concern of the emerging markets. According to Bagwell and Lee (2020), the costs of transportation had up until recently shown a tendency to decrease as a consequence of the usage of large vessels in the ocean, new technology in the handling of cargo, and higher usage of air transportation. On the other hand, in the current globalized world economy where "instantaneous reaction" is indeed substituting keeping large inventories, all care now is, in fact, ceaselessly focused on distance and even the time it takes to transport a product. Morrow (2010) adds that the quantity of trade and specialization of the production process will be decreased, and relatively also, there could be a change overall in trade structure because of differences in the cost of transport for varying commodities.

If the cost of transport is amply huge between countries, despite the existence of differences in autarky prices between products from different countries, the trade will remain limited. Indeed, the cost of transport could lead to the existence of goods regarded as non-tradeable. Lastly, because relative product prices are hard to equalize in the existence of transport costs amongst and between nations, relative prices of factors of production cannot

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equalize and therefore, fully factor price equalization will not be realized (Ruffin, 1984; Helpman, 1984).

Export Taxes

The government of a country exporting a commodity levies an export tariff. Developing economies mostly use these export taxes when they are certain that the export price is indeed lower than need be. Traditionally, export taxes are imposed on domestic products intended for export. This has a negative effect because it lessens the degree of international trade. Morrow (2010) argues that export subsidies which act as negative taxes have the ability to improve the trade flow of a country. Export duties bring distortions to the trade patterns from those of comparative advantage and because they interfere with laissez-faire, reduce world welfare (Brander & Spencer, 1984). Conversely, Bagwell and Lee (2020) illustrate that a country actually benefits when slightly more export subsidies are introduced as long as trade costs are low and remarkably, the dispersion of productivity within the country is high.

Considering the welfare of the nation exporting the commodity, export tax will cause lower domestic prices as multinationals try to enlarge sales domestically to evade paying taxes imposed on exported commodities. There will be a decline in domestic prices until they equal international prices minus the tax imposed. According to Motta (1992), domestic prices will continue to decrease and this will, in turn, cause the quantity supplied to contract in the market. Producer surplus declines, part of which is directly moved to consumers through a decrease in prices. Furthermore, the government acquires tax revenue. Subsequently, if you consider the winners and losers and add up the impact of the policy on export, Morck and Yeung (1991) claim that the net consequence on a developing country's economy becomes deleterious. Indeed, since the local demand and supply react negatively, this paper stresses that the quantity of exports is now lower after-tax. Developing countries' governments overestimate the revenue from the tax to be earned in cases where they do not completely consider the reduction of export quantity.

If local demand and supply have low elasticities, the effect will be smaller on the quantity of export, but the revenue collected by developing countries' governments will be higher. On the other hand, if the producer and consumer responses command low elasticities, then the deadweight efficiency losses are low (Wheeler and Mody, 1992; Ethier, 1986). Economists consider MNCs as firms which have subsidiaries in more than three economies; consequently, their operations are regarded as multinationals. According to Krugman and Obstfeld (2009), in the theory of economics, MNCs are not the same as those firms in perfect competition. MNCs own proprietary assets like technology and skills, among others. Horstmann and Markusen (1987) report that MNC can exploit these proprietary assets by means of monopoly pricing, in which case they charge economic rent. This they do by selling contracts to other MNCs to utilize the assets.

With the existence of high production costs in developing countries, emanating from high transport costs, government barriers, and even consumers' tastes and preferences, MNCs may be forced to utilize different "market serving" and or "input seeking" substitutes. Theoretically, therefore, the existence of MNCs depends on the ownership of the proprietary assets, production costs in developing economies, and the consumers' tastes and preferences. These then justify FDI and production in the domestic economy as compared to "market serving" or "input seeking" alternatives (Either, 1986).

This study considers a partial equilibrium Cournot oligopoly model where local firms and multinationals compete in a developing country that serves as a market for the tradable commodity. The paper assumes that local firms are fixed in numbers,

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but MNCs and hence FDI are flexible and can be influenced by the host developing country's government. The host country could affect MNCs through two instruments: an export tax on the MNCs and a variable, which specifies the quality level of the host country's transport costs. By equating the profits of multinationals to an explanatory level demonstrating the reservation level of profits, this paper quantifies FDI equilibrium. MNCs could still obtain this reservation profit level if they venture into alternative markets.

Notwithstanding the acknowledged significance of export taxes and transport costs for multinationals with affiliates selling globally, theoretical studies have a tendency to assume such vital costs. This paper considers the impact of export taxes and transport costs for an oligopoly selling goods in the local (certain) and global (uncertain) market. This study will demonstrate that the number of MNCs' subsidiaries in developing countries depends on transport costs and export taxes (Lahiri & Ono, 1998; Brander & Spencer, 1984, & Keen, 1991).

The academic work on foreign direct investment (FDI) is huge, with numerous components and consequences. An imperative interrogation by economists in this field, more often than not, is location choice by multinational corporations (MNCs). The intention of this study is not to deliver additional determinants of location decisions for FDI by MNCs. The emphasis of this study is on the host country's attractiveness to MNCs' location decisions via two channels: transport costs and export taxes. Thus, this study considers the host country's level of transport costs at an optimal domestic output and the degree of export taxes at an optimal output level produced for the foreign market.

An extensive base to aid in conversing and assessing many key questions related to this study is richly provided by the economics of imperfect competition. This study, consequently, creates a model that is grounded on the economics of imperfect competition to make known MNCs' actions and locational choices. The theoretical section of this study develops a model. This model responds to the following research question: when is it profitable for a multinational to place one of its subsidiaries in a specific selected developing country to sell its product in that market in lieu of exporting the product in that country, given that the product was produced in the mother country of the multinational? The theoretical model of this study, consequently, has three specific objectives: (a) to examine the effect of transport costs on the number of multinationals entering developing countries; (b) to evaluate the impact of export taxes on the number of multinationals entering developing countries, and (c) to assess the influence of the interaction between transport costs and export taxes on the number of multinationals entering developing countries. The pragmatic methodology in this study is an ingenious development of a thought, a notion, construct, or knowledge drawn from a specific experience of a reality that needs further interrogation. This theoretical study, therefore, aims to show commonalities in phenomena that appear isolated at a glance. This is the case with the effect of export taxes and transport costs on the number of MNCs investing directly in host developing countries. With theoretical discoveries in this paper, empirical researchers in this area can then make sense because theoretical concepts have identified the universals of these experiences.

To respond sufficiently to the research question and the stated objectives, this paper is structured in four parts or sections: section two deals with theoretical and empirical literature review, section three presents a Cournot oligopoly model of transport costs and export taxes, and the last section concludes the study and gives policy implications.

LITERATURE REVIEW

The significance of MNCs in global trade through FDI and technology transfer is well known. In the

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management of their far-flung affiliates, MNCs have long-established their capability to build and sustain a global linkage concerning manufacturing, marketing, and financing activities. As reported by Morrow (2010), the supposedly "new trade theory" and later works on "geography and trade" have impressively enhanced economists' knowledge of the trade. Trade and welfare from trade according to the new trade theory, can arise independently of any pattern of comparative advantage (as customarily assumed). This comes in the process of multinationals exploiting economies of scale and pursuing tactics of commodity differentiation in the world's imperfectly competitive environment. According to Brainard (1993c), works on geography and international trade flow are actually a natural extension of the research line mainly centred on how industry agglomeration and regional differentiation can sprout endogenously because of transport costs, market size, and the trade regime. This paper finds these innovative streams of work inadequate in their analysis of multinationals. In fact, these new models treat firms synonymously with the production facility of a firm unit, indicating that a firm should be treated as a completely autonomous organization that produces a commodity in one location.

A production that comprises both multi-plant and multiproduct, be it horizontal or vertical, is mostly omitted from numerous studies. Actually, this is disturbing. In any case, manufacturing regarded as enjoying economies of scale coupled with imperfect competition is always dominated by multinationals. Considerable large ownership by foreigners of the local production facilities fundamentally changes policy implications domestically (Ethier and Horn, 1990; Morck and Yeung, 1991; Smith, 1987; Demir and Lee, 2022).

Domestic investment by foreigners is of two types: (i) FDI located in a host country by a multinational, which comes with all required managerial resources, and (ii) portfolio investment that comprises ownership by a multinational of a part of the capital stock. The latter form of foreign investment, which is prevalent in the literature on tax competition, foreign investment is equivalent to the international mobility of capital as a factor of production (Ethier, 1986; Ruffin, 1984).

The theoretical literature on FDI is huge and has frequently and extensively been reviewed. Three strands, so to speak, exists. Firstly, those studies emanating correspondingly from international trade theory (Marrow, 2010; Ethier & Horn, 1990; Branderand & Spencer, 1987; Ethier, 1986; Dixit, 1984; Helpman, 1984; Hillman & Ursprung, 1993; Horstman & Markusen, 1987; Katrak, 1977; Motta, 1992; Smith, 1987); secondly, public finance (Janeba, 1995; Wildasin, 1989) and thirdly, those of international business (Chair *et al*. (2022); Dunning, 1993; Casson & Pearce, 1987).

A dominant background of inquiry, the ownership location internationalization (or OLI) model, or the "eclectic theory" as Dunning (1993) titled it, exists. Numerous studies mentioned in this study thus far are tailored into one of the three (O, L, or I) groupings. In consonance with Keen (1991), the recent ferocious rivalry of FDI literature (predominantly public finance) on tax competition has seriously been advanced. However, foreign investment is of the portfolio type in this literature. This paper, unlike the bulk of other mentioned studies, considers the viewpoint of the host developing country.

Economists examine multinationals exhaustively within the background of economic theories and models of the firm, industrial organization, and location (Morrow, 2010). This analysis of multinationals however is not in tandem with numerous limiting assumptions of the Heckscher-Ohlin-Stolper-Samuelson model of international trade. The reasons are that the models hypothesize a world of perfect factor and product markets, factor immobility, zero transport costs, and internationally identical production functions, just to mention a few. Export marketing costs like export taxes, by

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inference, are non-existence or reasonably indistinguishable from local marketing costs. The Heckscher-Ohlin-Stolper-Samuelson model takes information concerning technology: product and process conditions, easily and instantaneously accessible to everyone. Given this, then, there exist identical production functions. In this Heckscher-Ohlin-Stolper-Samuelson world, there is room for trade only and its direction is determined by comparative costs, which are viewed by the individual firms as absolute costs. (Morrow, 2010; Donnenfeld & Weber, 2000; Ethier & Horn, 1990).

Briefly, take two countries W (home to a multinational firm) and Z (proposed host of the multinational firm). Further, suppose given commodity x, Z is a developing nation and a multinational in W is reflecting on opening an affiliate in Z to sell its products both in W and in Z. In the Heckscher-Ohlin-Stolper-Samuelson realm, W's firms do not enjoy any benefit, which empowers them to compete with Z's firms. Amazingly, the proprietary brand knowledge that is contained in the commodity, either in development processes or markets that advantageously give them a competitive edge is non-existent. Significant brand knowledge, even though it could be emanating from W, is promptly accessible by Z's MNCs with zero costs. Given this argument, FDI by multinational firms cannot occur despite the fact that the proposition of global factor mobility is relaxed. Suppose a case where W is assumed to be the mother country of the multinational firm. W's multinationals may possibly inject low-cost capital into Z's firms. This reduces general manufacturing costs in Z. If physical capital were actually and freely transferable internationally, then clearly, there is no motive for FDI. Z's firms could easily borrow low-cost physical capital from the W's capital markets and add it to their own domestic firms. In this instance, W's firms possess zero benefits compared to Z's firms in the process of implementation of this vital transfer. Additionally, if you suppose that physical capital's movement is entirely unrestricted, the cost of capital in both W and Z will be equalized. Indeed, equal perceptive applies to all other factors that produce goods and are not specific to the firm.

In fact, in the Heckscher-Ohlin-Stolper-Samuelson realm, it is irrelevant where the home of the multinational firm is located. It could either be in W or in Z. The reason is that communications and transport costs that are seemingly related to the control and managing of both foreign and affiliate operations are taken to be zero. This assumption is relaxed because, without capital mobility, FDI is ruled out by definition. Indeed, this study assumes that MNC does not raise their entire capital requirement from the host developing countries. Without proprietary knowledge and global capital mobility, MNCs' "foreignness" could ostensibly be noticed by their home address only. FDI can hardly be explained by the relaxation of the traditional assumption of the constant return to scale. Without transport and export costs, the optimal size of a firm or firms will at least be less expensive to manage in economies that command a comparative advantage in production. Because there is no relationship between scale economies and the size of the local market, economies of scale should improve and not offset comparative advantage.

FDI is a very mesmerizing marvel. Export duties by developing host economies force MNCs to produce and sell domestically therefore pushing down prices. This will create an outflow of domestic firms to other countries as their profits dwindle. Consequently, in the policy formulation on the subject of FDI, developing countries cannot ignore the impact such policies have on local manufacturing firms else; a great number of these firms will unwaveringly cast their vote with their feet to the drawback of the domestic economy (Jeneba, 1995; Lahiri and Ono, 1998; Katrak, 1977).

Dunning (1993) claims that rent-, market-, efficiency-seeking and strategic assets are encouraging motives of FDI inflows into

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developing nations by MNCs. Precisely "rent-seeking" motivation includes multinationals in search of low-cost factors of production and, more importantly, raw material inputs of production. "Market seeking" FDI motivation encompasses multinationals either exporting or opening affiliates in host countries with the aim of raising global sales to maximize profit. This is important because it shields multinationals from encountering trade barriers and needless transport costs and the tough rule of origin. The "efficiency seeking" MNCs prefer using only a small number of nations that can effectively serve larger markets. There are factors crucial in these motives including location, government control and regulation, and the host nation's economic endowment. Lastly, the "strategic-asset" motivation drives preserving multinationals' position and effectiveness (Casson & Pearce, 1987; Horstmann & Markusen, 1987).

This paper focuses on export taxes as an important policy factor influencing the flow of FDI. Import taxes induce export-oriented FDI, while both imports and exports taxes attract "tariff-jumping" FDI that aims firstly at benefiting from the local market (Kosteletou & Liargovas, 2000). Hypothetically speaking, the barriers to international trade or even liberalization of trade movements all have either negative or positive impacts on FDI. A number of policies on trade liberalization could yield a substantial influence in appealing to FDI (Gao, 2005). Since the inception of the free trade agreements (FTA), numerous Latin American economies have continuously attracted a great amount of FDI inflows.

There is the submission by Krugman & Obstfeld (2009) that FDI nurtures exports, import-substitution, and even larger international trade in intermediary inputs. Montero (2008) claims that in some circumstances, an FTA will not necessarily amount to FDI inflows even if it could be welfare improvement because of the fact that equilibrium export and import taxes are audaciously too low to encourage FDI inflows. In fact, there may also be multiple equilibria and Latin American economies could be stuck in one that repulses FDI inflows. In a number of studies, Chakravorty and Mazumdar (2008) find a positive and statistically significant effect of low taxes on FDI inflows. Conversely, Donnenfeld and Weber (2000) observe a negative and statistically significant impact of lower export and import taxes on FDI inflows for those economies in transition. Indeed, the relationship among export taxes, import taxes, and FDI inflows appears to be complex and calls for careful analysis and could be contingent on the nature of each nation. The extent to which FDI inflows are impacted by taxes on trade differs according to the purpose of involving in FDI activities (Bagwell & Lee, 2020; Dunning, 1993; Keen, 1991; Donnenfeld & Weber, 2000).

Trade globalization, as hypothesized by theoretical literature, has two offsetting impacts on the inflow of FDI to developing nations: (a) intra-firm trade is eased by the opening regime, which permits more freedom to multinationals. This trade openness is export-friendly. It could make the host nation a wonderful place to conduct business with foreign firms. This could lead to an increase in FDI inflows. (b) Motta (1992) reports that locational benefits are offered by trade regimes with high tariffs. This seems to attract tariff jumping form of FDI by MNCs (Gao, 2005; Brander & Spencer, 1984; Dixit, 1984).

The question of whether the quantity of FDI inflows is negatively correlated with export taxes and/or transport cost or not remains an ambiguous response. Yet, Brainard (1993c) convincingly in new evidence, unequivocally shows that the proportion of sales by a foreign subsidiary in the total exports is correlated positively to the transport costs and trade barriers. This notwithstanding, it seems to indicate that export taxes as a form of barrier to trade and costs of transport do indeed cause a reduction in the level of both investment and trade.

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In a number of studies, the estimated regression coefficient on transport cost and export tariffs has been found to be statistically insignificant and/or had recorded the wrong sign in the equation with measures of multinationalism as an endogenous variable. Mixed results that discussed the degree of affiliate sales abroad were also found (Brainard, 1993c). The reason for this justification seems to be that most of the affiliates had, in their production a significant portion of imported content. Conclusively therefore, export taxes and transport costs depress subsidiaries' productions the same way they depress exports (Smith, 1987; Motta, 1992; Wheeler & Mody, 1992).

From the above-reviewed literature, it stands out that this research is motivated by the following question. When is it profitable for a multinational to actually move some of its affiliates into a specific developing country in order to trade in that very market in lieu of exporting the product to that country after producing it in the home country?

THEORETICAL MODEL

This study emphasizes horizontal FDI, inferring the fact that production by MNCs in host countries is in some way equivalent to those multinationals have in their mother countries. In fact, vertical FDI (where using the production phases, manufacturing processes are divided geographically) is not as significant as horizontal FDI, quantitatively speaking. The theory developed in this study assumes that MNCs assess pertinent country features given all locations that are practically possible. Multinationals are therefore assumed to consider those locations that will provide maximum expected profits, given the selections among developing economies. This study is based on the following fundamental assumptions.

- Trade barriers limit the imports and exports of foreign firms' products
- There exist transport costs
- The foreign firm competes in both domestic and foreign markets with many local and foreign manufacturers.
- The number of foreign firms undertaking production in the host country is endogenous and depends on government policy and transport costs.

I consider a partial equilibrium model of an oligopolistic industry in which there are n identical foreign firms. Each foreign firm produces output for both home consumption and exports. The marginal costs are taken to be constant, and they are also the average variable costs. The *n* foreign firms compete in the domestic and foreign markets for two commodities. The inverse demand functions for these commodities are given by;

$$P_i = g_i(D_i),\ g' < 0,\ \ i = d, f \tag{1}$$

Where P_i and D_i are respectively the prices and the total demand in the ith market.

The inverse market demand functions are assumed to take the linear form:

$$P_d = g_d(nx_d) = \alpha_d - \beta_d n x_d, \tag{2}$$

Which is the domestic market-clearing price, and,

$$P_f = g_f(nx_f) = \alpha_f - \beta_f n x_f \tag{3}$$

is the foreign market-clearing price. x_d and x_f respectively denote the quantities of output produced for the domestic market and for the foreign market respectfully by each foreign firm. Also, this can be followed in Appendix A1 and A2.

Therefore,

The aggregate quantity on the domestic market is

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$$D_d = nx_d \quad (4)$$

And the aggregate quantity on the foreign market is given by;

$$D_f = nx_f \quad (5)$$

I will assume that the total cost of producing the two homogenous goods x_d and x_f is given by,

$$C_i(x_{di} + x_{fi}) = c(x_d + x_f) \quad (6)$$

Where *c* is a fixed constant. In this model, there are no fixed costs and the marginal cost *c*, is constant.

The firms incur transport costs for selling in the domestic market. Let t_d capture the unit transportation cost incurred by the firm in producing each unit of output and selling it domestically. There is also a cost t_f that each firm incurs on export; export tax.

Profits for each firm are given by,

$$\Pi = g_d(nx_d)x_d + g_f(nx_f)x_f - c(x_d + x_f) - t_d x_d - t_f x_f \quad (7)$$

I assume that the number of foreign firms, *n*, is endogenous and the government in the host country can affect this number by changing the values of the export tax $t_f$and/or having better/poor quality infrastructure t_d. This model assumes that developing countries hosting multinationals will not renege on their promises relating to taxes when the irreversible capital have already been invested. Reneging could result in multinationals temporarily enjoying tax holidays.

Following Lahiri and Ono (1998), a developing country is assumed to be small in the market for FDI, i.e., foreign firms would enter (exit) a developing country if profits realized in the developing country, Π, are greater (lower) than those at reservation profits, $\bar{\Pi}$, they can make it elsewhere globally.

Therefore, this paper has, in equilibrium;$\Pi = \bar{\Pi}$

If we have a case where; $\Pi > \bar{\Pi}$, foreign firms would enter, $\Pi < \bar{\Pi}$, foreign firms would exit, $\Pi = \bar{\Pi}$. Foreign firms would be indifferent. This is the FDI equilibrium condition.

The firms are assumed to behave in a Cournot Nash fashion; therefore, the first order profit maximization conditions are;

$$\frac{\partial \Pi}{\partial x_d} = g_d - c - t_d + x_d g'_d = 0 \quad (8)$$

hence,

$$g_d - c - t_d = -x_d g'_d \quad (9)$$

$$\alpha_d - \beta_d n x_d - x_d \beta_d = c + t_d \quad (10a)$$

$$\beta_d(n+1)x_d = \alpha_d - c - t_d \quad (10b)$$

Thus, the optimum domestic output (equilibrium output) produced for the local market is;

$$x_d = \frac{\alpha_d - c - t_d}{\beta_d(n+1)} \quad (11)$$

Noting that this Nash equilibrium quantity x_d is derived under the assumption of symmetry since $x_{d1} = x_{d2} = \ldots\ldots = x_{dn} = x_d$

Similarly, for the foreign market,

$$\frac{\partial \Pi}{\partial x_f} = g_f - c - t_f + x_f g'_f = 0 \quad (12)$$

hence;

$$g_f - c - t_f = -x_f g'_f \quad (13)$$

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$$\alpha_f - \beta_f n x_f - x_f \beta_f = c + t_f \quad (14a)$$

$$\beta_f (n+1) x_f = \alpha_f - c - t_f \quad (14b)$$

The optimum output level produced for the foreign market is

$$x_f = \frac{\alpha_f - c - t_f}{\beta_f (n+1)} \quad (15)$$

where;

$x_{f1} = x_{f2} = \ldots\ldots\ldots = x_{fn} = x_f$, by symmetry

This is also shown explicitly in Appendix A3 and A4.

We also have;

$$\Pi = (g_d - c - t_d) x_d + (g_f - c - t_f) x_f \quad (16)$$

$$= \beta_d {x_d}^2 + \beta_f {x_f}^2 = \bar{\Pi} \text{ (reservation profit)} \quad (17)$$

and substituting respectively, the output produced for the domestic market and that which is produced for the foreign market, we get

$$\bar{\Pi} = \frac{(\alpha_d - c - t_d)^2}{\beta_d (n+1)^2} + \frac{(\alpha_f - c - t_f)^2}{\beta_f (n+1)^2} \quad (18)$$

Which gives,

$$(n+1)^2 = \frac{(\alpha_d - c - t_d)^2}{\beta_d \bar{\Pi}} + \frac{(\alpha_f - c - t_f)^2}{\beta_f \bar{\Pi}} \quad (19)$$

Differentiating the above, I get,

$$2(n+1)dn = -\frac{2(\alpha_d - c - t_d)}{\beta_d \bar{\Pi}} dt_d - \frac{2(\alpha_f - c - t_f)}{\beta_f \bar{\Pi}} dt_f \quad (20)$$

Therefore, I get;

$$\frac{dn}{dt_d} = -\frac{(\alpha_d - c - t_d)}{\beta_d \bar{\Pi}(n+1)} < 0 \quad (21)$$

That is, if t_d (transport cost) increases by one unit, then n (the number of foreign firms) will decrease by, $\frac{\alpha_d - c - t_d}{\beta_d \bar{\Pi}(n+1)}$. Also;

$$\frac{dn}{dt_f} = -\frac{(\alpha_f - c - t_f)}{\beta_f \bar{\Pi}(n+1)} < 0 \quad (22)$$

That is if t_f (export tax) increases by one unit, the number of foreign firms n will decrease by, $\frac{\alpha_f - c - t_f}{\beta_f \bar{\Pi}(n+1)}$.

From the results above, we have seen that n (foreign firms) will decrease if either t_d or t_f increases. That is FDI increases as either the level of transportation costs decreases or if the country becomes more open in the commodity market by reducing export tariffs.

Transportation costs and export taxes interact and this interaction effect is given by;

$$\frac{d}{dt_f}\left(\frac{dn}{dt_d}\right) = \frac{(\alpha_d - c - t_d)}{\beta_d \bar{\Pi}(n+1)^2} \frac{dn}{dt_f} = -\frac{(\alpha_d - c - t_d)(\alpha_f - c - t_f)}{\beta_d \bar{\Pi}^2 (n+1)^3 \beta_f} < 0 \quad (23)$$

This theoretical model finds that the interaction effect is negative.

This theoretical model, unambiguously, finds that when an economy's transport costs increase, the impact of such high costs on the number of multinationals and hence on FDI inflows will be big. When such an economy becomes more closed as a result of higher export taxes, there will then be a bigger drop-off in the number of MNCs and hence a bigger drop in FDI inflows. This implies that countries with good economic infrastructure will drastically reduce transport costs. With better infrastructure in place, reduced export taxes will lead to increased trade openness, which in turn will lead to a greater marginal gain in FDI inflows.

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Consequently, the model shows that transport costs and export taxes interact to make a given developing country either more or less attractive as an FDI destination. Despite the simplification of this model, of the many real-world events, it remains suggestive, and further research needs to be undertaken empirically to test its robustness.

CONCLUSION

In this study, the paper meticulously constructed a theoretical model of a small developing economy in the global marketplace for FDI. The paper takes multinationals as globally mobile firms. The paper firstly studied the impact that transport costs would have on the number of MNCs. The finding is that as transport costs rise, the number of MNCs will decrease. Then, the study examined the effect of export taxes on the number of MNCs. The finding is that as export taxes increase, the number of MNCs will decrease. Finally, this study examined the effect of a country that has both high transport costs and export taxes. The conclusion was that such a country would have a greater drop-off in FDI inflows.

Several key imperative intuitions have stemmed from this study, notwithstanding the gargantuan and complex nature of multinationals' decision making. Indeed the locational production choice has been see to be a function of transport costs and export taxes alike.

Policy Implications:

These results have significant policy implications and specifically for developing host nations. For the reasons that MNCs result in employment creation, export promotion and more importantly increasing productivity due to access to advanced technology, policy reforms are needed. These reforms should aim at improving the quality of infrastructure and opening up the economy to attract foreign investment.

Future Research

A whole lot remains to be studied in the literature on international trade and the theory of the firm. First, economists have for a long time relied on proxy variables to empirically test theories; real data on transport costs and export taxes would empirically make this researcher richer. Case studies are very valuable in unravelling the kind of services provided to affiliates by the MNCs. The vertical movement type of FDI is gaining prominence in developing countries. The division of production into stages that are then located strategically globally is of paramount importance to developing countries that are rapidly liberalizing their economies and enlarging regional integration.

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APPENDIX

$$\boldsymbol{P_d = g_d(nx_d) = \alpha_d - \beta_d nx_d g'_d = -\beta_d} \quad \textbf{(A1)}$$

$$P_f = g_f(nx_f) = \alpha_f - \beta_f nx_f g'_f = -\beta_f \quad \text{(A2)}$$

Also;

$$\Pi = (\alpha_d - \beta_d nx_d)x_d + (\alpha_f - \beta_f nx_f)x_f - c(x_d + x_f) - t_d x_d - t_f x_f \frac{\partial \Pi}{\partial x_d} = (\alpha_d - \beta_d nx_d) + x_d(-\beta_d) - c - t_d = 0$$

$$= \alpha_d - \beta_d nx_d - \beta_d x_d - c - t_d = 0$$

$$= \beta_d nx_d + \beta_d x_d = \alpha_d - c - t_d$$

$$x_d = \frac{\alpha_d - c - t_d}{\beta_d(n+1)} \quad \text{(A3)}$$

$$\frac{\partial \Pi}{\partial x_f} = (\alpha_f - \beta_f nx_f) + x_f(-\beta_f) - c - t_f = 0$$

$$= \alpha_f - \beta_f nx_f - \beta_f x_f - c - t_f = 0$$

$$= \beta_f nx_f + \beta_f x_f = \alpha_f - c - t_f$$

$$x_f = \frac{\alpha_f - c - t_f}{\beta_f(n+1)} \quad \text{(A4)}$$

