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Abstract

We investigate the market and societal effects of a socially responsible multinational enterprise's entry in a host market through exports and through FDI, the determinants of the multinational's decision between exports and FDI, as well as the respective host country's policies. We find that the multinational enterprise, seeking for a competitive advantage in the host market, strategically engages in CSR activities and meets the corresponding demand by socially conscious consumers. The tariff charged by the host government increases with the social consciousness of this country's consumers. We also find that CSR activities are welfare enhancing for consumers and firms and thus, they should be encouraged.

Keywords Corporate social responsibility; Multinational enterprises; Foreign direct investment; Exports; Import tariffs

JEL Classification D43; F13; F23

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1 Introduction

The practices, the market and societal effects of multinational enterprises (MNE) are core determinants of globalization, mainly through foreign direct investments (FDI) and international trade (United Nations, 2014a; 2014b). This core role of MNEs has recently given rise to increased attention regarding the social and environmental consequences of their activities, from business, consumers, investors, policy makers and academics.

KPMG (2013) suggests that CSR is now undeniably a mainstream business practice worldwide. Almost 93% of the top 250 companies of the Fortune Global 500 ranking for 2012 state a well-defined CSR strategy. Moreover, existing evidence suggests that consumers exhibit increasing trends on their awareness regarding the social and environmental consequences of firms' production and their expectations on firms' CSR activities are expressed through their product, services and equity purchasing decisions (Fliess et al., 2007; Becchetti et al., 2011).[1] In this context, Andries (2008) highlights the increasing trends in the value of portfolios of stocks containing only SR firms, traded in the Socially Responsible Investment (SRI) and other "ethical" indices (KLD Domini 400 Social Index, Dow Jones Sustainability Index, FTSE4Good Index). McWilliams and Siegel (2011) cite evidence supporting that investors reward SR firms and penalize non-SR ones. At the same time, the promotion of CSRs has become a top priority in the policy agenda for sustainable development in many countries and international organizations. Interestingly, when CSR started becoming widespread, its further encouragement became a central policy objective in both the U.S. and the E.U., aiming at the promotion of sustainable growth and competitiveness (European Commission, 2001; 2006).[2,3]

Yet, Benabou and Tirole (2010) state that "Despite its growing importance, little is known about the economics of individual and corporate social responsibility" and in the same spirit,

[1] Widespread evidence from manufacturing industries (Elfenbein and McManus, 2010; Hiscox and Smyth, 2006), tourism services (Blanco et al., 2009) and agricultural production in Latin America (Plastina and Arnould, 2007) and African countries (Becchetti and Costantino, 2006), suggests that consumers express a willingness to pay a premium for goods and services produced by socially responsible firms.

[2] Although their main objective is the same, Doh and Guay (2006) argue that "different institutional structures and political legacies in the U.S. and E.U. are important factors in explaining how governments, NGOs, and the broader policy determine and implement preferences regarding CSR in these two important world regions".

[3] The OECD Guidelines for MNEs (OECD, 2011) offer government-backed recommendations covering business conduct in a wide variety of areas, including employment and industrial relations, human rights, disclosure of financial and non-financial information, environmental issues. The UN Global Compact principles acknowledge the importance of communicating with stakeholders when supporting a precautionary approach to environmental challenges and encourage enterprises to develop sustainability indicators and measure, track, and report progress in incorporating sustainability principles into business practices.

Campbell et al. (2012) argue that "little research has been done on the motivations, either strategic or altruistic, behind CSR by MNEs in host countries". Motivated by the above, this paper addresses the following questions: Do firms undertaking CSR activities perform better than not undertaking, i.e., do firms "do well by doing good", under exports as well as under FDI?[4] Moreover, do FDI and international trade promote consumers' surplus and total welfare? If yes, what kind of initiatives should policy makers undertake to further encourage CSR? Should the host country's policy maker set a subsidy or a tariff to the MNE, if the latter choose to serve the host market through exports? Should the former subsidize the MNE's inward FDI? What determines the MNE's decision to export to or to activate a branch plant in the host-country market? Moreover, how does the timing at which the trade policy is set influences corporate decisions as well as overall market and societal outcomes? What are the market and societal effects of a policy initiative aiming at the maximization of global total welfare?

To address the above questions, we consider two large publicly traded firms, each located in a different country. One of the firms, the multinational firm, plans to serve the foreign market either through FDI, consisted by the establishment of a production plant at a sunk cost, or through exports. The exported products are labeled as *responsible* products "because their production processes comply with criteria for social and environmental sustainability" (Becchetti et al., 2011) which could be in the spirit of the GRI framework (GRI, 2011).[5]

Each firm's owners have the option to follow a "doing well by doing good" strategy, through their firms' engagement in CSR activities, in order to meet the corresponding preferences of socially conscious stakeholders. This strategy can be represented in the firm's *mission* picked by its owners (Besley and Ghatak, 2005; 2007). As Porter and Kramer (2006), we consider that CSR activities take the form of voluntary investments in production technologies and business processes along the value chain, beyond the law requirements, in favor of firms' stakeholders. In the terminology of Porter and Kramer (2011), these activities connect company success with social progress and constitute a profit center for firms while creating value and for society,

[4] According to Benabou and Tirole (2010), "being a good corporate citizen can also make a firm more profitable".

[5] According to European Commission (2009), "Fair Trade has played a pioneering role in illuminating issues of responsibility and solidarity, which has impacted other operators and prompted the emergence of other sustainability regimes. Trade-related private sustainability initiatives use various social or environmental auditing standards, which have grown in number and market share".

by addressing its needs and challenges.[6,7] Firms' products combine horizontal and vertical differentiation aspects (Häckner, 2000; Garella and Petrakis, 2008). The latter implies the attachment of socially responsible (SR) attributes, perceived by socially conscious consumers as a "quality improvement" (see also, McWilliams and Siegel, 2001; Bagnoli and Watts, 2003).[8] In each country, consumers are heterogeneous with respect to their social consciousness and have differential valuations for the products' SR aspects. Moreover, the two countries differ in the social consciousness of the average consumer.[9]

Our main finding is that in equilibrium, both firms, seeking for a competitive advantage in the market, engage in CSR activities in order to meet the corresponding demand by socially conscious consumers in each country. Interestingly, output, price and profits of a SR firm are higher than the respective ones of a non-SR because in the former case, the firm's output reaction function shift outwards increasing its product's price, since consumers are willing to pay more for its product's SR attributes. Although a higher CSR effort increases the firm's unit cost, it is the former positive effect which dominates. Moreover, the equilibrium CSR effort and output increase with the degree of social consciousness of the average consumer type in a country, as well as with the efficiency of the CSR and output "production technology".[10] From a welfare point of view, we find that firms' CSR activities increase consumers' surplus

[6] Such stakeholders are firms' employees (investments in health and safety in the workplace), suppliers (support to local suppliers rather than cheaper alternative sources), and the environment (reduction on emissions of pollutants; use of environmentally friendly technologies). See for example Brisley et al. (2011).

[7] Firms care about their involvement in socially responsible actions (i.e., a "warm glow"), instead of donating to "intermediaries" (Benabou and Tirole, 2010). In fact, according to Besley and Ghatak (2005), "donating our income earned in the market to an organization that pursues a mission that we care about is likely to be an imperfect substitute for joining and working in it". Moreover, existing evidence suggests that socially responsible consumers show strong preference for CSR related products, instead of buying products not connected to CSR that cost less and donating the rest of the money to a socially responsible cause (Amacher et al., 2004; Bjorner et al., 2004). This is so because "there is no substitute for asking the firm to behave well when the state does not impose constraining regulations" (Benabou and Tirole, 2010).

[8] These SR attributes can be unobservable by consumers, even after consumption, and hence, they are classified as credence goods (Manasakis et al., 2013; 2014). The resulting moral hazard problem implies that once consumers have been convinced that a firm has undertaken the missioned CSR efforts, the firm has incentives to cheat them and avoid any spending on costly CSR activities (Besley and Ghatak, 2007). In order to avoid the failure of the SR related goods' market, firms publish certified periodical reports regarding their CSR activities and performance against CSR certification standards. Hence, we resolve any possible informational asymmetries by assuming that consumers perceive these reports as credible information disclosure mechanisms (see Verdantix, 2011; KPMG, 2013).

[9] We formalize the case of localized CSR activities ("every-country-a-different-strategy" in the terminology of Lucea and Doh, 2012) which may be required when there are differences in the formal institutional contexts as well as in customer needs and tastes between the home and host markets (Jamali, 2010).

[10] These findings are in line with Boehe and Cruz (2010), suggesting that CSR is a potential way of improving export performance under conditions, but only when an exporter understands the conditions under which different kinds of product differentiation may influence export performance.

and total welfare, implying that CSR is welfare enhancing and should be encouraged, e.g. by raising consumers' awareness on social and environmental issues; building capacities for CSR; improving disclosure, transparency and the quality of CSR reports; facilitating socially responsible investment (SRI) (Steurer, 2010).[11]

Regarding the policy tools of the host country's policy maker, if the MNE chooses to serve the host country through exports, the tariff charged increases with the social consciousness of this country's consumers. If the MNE chooses to establish a production plant in the host country, its policy maker can offer a "fixed" subsidy equal to the sunk cost of the FDI increased by the difference in the MNE's gross profits between exports and FDI.[12]

The MNE chooses to serve the host country through FDI, if and only if the sunk cost for the establishment of a production plant is sufficiently low. The maximum affordable level of this sunk cost increases in the social consciousness of the host country's consumers. Intuitively, an increase in the social consciousness of the average consumer, increases the population's willingness to pay and the demand for SR products. The positive output expansion effect dominates the negative production cost effect and the MNE's profits increase. A core message of the above finding, and a contribution of the paper, is that a MNE should carefully assess the social consciousness and the respective willingness to pay for SR products, of a host country's consumers. Moreover, as the goods become less differentiated and market competition becomes fiercer, the MNE's maximum affordable sunk cost for the FDI is being reduced.

In this context, we identify the differential impact of the MNE's two modes on entry in the host country in its consumers' surplus and total welfare: Consumers' surplus in the host country is always higher under FDI than under exports; while, the opposite holds for total welfare. Intuitively, the tariff charged to the MNE by the host country's policy maker reduces its exporting quantity which is lower than that produced under FDI. Because of strategic substitutability in output levels and fiercer market competition under FDI, the output of the firm initially located in the host country is higher under FDI than under exports and total output in the host market is always higher under FDI too. Yet, this positive effect of consumers'

[11] This can play an "important role in providing incentives for responsible production and responsible business behavior. Consumers are expected to exercise critical choice and encourage good products and good companies" (European Commission, 2006).

[12] Skaksen (2005) presents stylized facts from several countries and industries suggesting that this kind of subsidy is widely used in practice. Considering the case of reduction in firm 1's profit taxes, another widely used type of subsidy, would give qualitatively similar results.

surplus under FDI is dominated firstly, by the relatively lower profits of the firm located in the host country, and secondly, by the tariff revenues on the host country's total welfare under exports. As a result, total welfare in the host country is always higher under exports than under FDI. Interestingly, the critical value of the sunk cost, below which the MNE serves the host country through exports, is higher when the host country's policy maker determines its optimal tariff after the MNE's decision on the mode of entry in this country. This may change the MNE's decision on its mode on entry in the host country which, in turn, will effect consumers' surplus and total welfare.

Finally, a trade policy maximizing international total welfare would impose a tariff rate higher than that maximizing the host country's total welfare. Such a policy would benefit the host country's firm solely, through raising the MNE's unit cost of export and implying a barrier to entry in the host country's market. Hence, the host country's firm has incentives to put pressure, e.g. through lobbying, for the establishment of such a policy.

Our findings provide some guidelines for future empirical research regarding the effects of CSR activities on MNEs' market performance, which, as mentioned above, is so far inconclusive. First, profits of MNEs undertaking CSR activities, independently of their mode of entry in host markets, are higher than the respective of MNEs not undertaking. Second, do SR MNEs follow a "one-size-fits-all" or an "every-country-a-different-strategy" approach (Lucea and Doh, 2012) when they develop their CSR strategy for host markets? Third, how does aggregate CSR performance affect national living standards and national competitiveness (Boulouta and Pitelis, 2013)?

The rest of the paper is organized as follows. In Section 2, we place our paper within the relevant literature. Section 3 presents the basic model and the benchmark cases. Section 4 presents the cases where the MNE serves the host market through exports and through FDI. In Section 5, we study the MNE's decision on the mode of entry in the host country. In Section 6, a number of extensions of our basic model is briefly analyzed. Finally, Section 7 concludes.

2 Related literature and contribution

Our paper contributes to two strands of the literature. First, it contributes to the literature studying MNEs' strategic CSR activities in imperfectly competitive markets, which, despite the growing relevant evidence and stylized facts is still scant. Wang et al. (2012) extend the

analysis of Brander and Spencer (1985), where two foreign firms export a homogenous good in a third country's market. Chang et al. (2014) extend Brander and Spencer (1984), where one domestic and one foreign firm produce a homogenous product in the domestic market. They both incorporate a possible consumer-friendly initiative, for each firm, constituted by own profit and consumer surplus maximization, and also, the country's government imposes tariffs against the importing firm(s). These papers suggest that the consumer-friendly initiative by both firms is beneficial for them as well as for the government and consumers. Becchetti et al. (2011) consider a standard Hotelling approach where a not-for-profit *fair* trader enters into a market, with heterogeneous consumers regarding their preferences on social responsibility, dominated by a profit-maximizing producer. Competition takes place over prices and costly socially and environmentally responsible features of their products. Their core finding is that the trader's entry triggers the partial adoption of CSR by the profit-maximizing competitor.

We depart from these papers in six dimensions. First, besides exports, we also consider the case where the MNE can serve the host market through FDI and examine the conditions under which the MNE choose exports or FDI. Second, contrary to Wang et al. (2012) and Chang et al. (2014), we assume heterogeneous consumers regarding their attitudes towards CSR. Third, the present paper treats the CSR effort level is a certain strategic variable for each firm. In Wang et al. (2012) and Chang et al. (2014) CSR is a "consumer-friendly initiative" which increases output and decreases price. The latter decrease is in contrast to existing evidence and stylized facts suggesting that consumers express a willingness to pay a premium for goods and services produced by socially responsible firms. Fourth, contrary to Becchetti et al. (2011), in the present paper, CSR is a for-profit strategy. Fifth, we examine how does the intensity of market competition, captured by the degree of product differentiation, affects market and societal outcomes. Sixth, we highlight the role of international organizations on the formation of policies that may encourage CSR initiatives by MNEs.

Second, our paper contributes to the rapidly expanding literature studying firms' CSR activities in oligopolistic markets. García-Gallego and Georgantzís (2009) study the effects of exogenous changes in consumers' willingness to pay for SR products on market structure, CSR efforts and social welfare. Bagnoli and Watts (2003) link the provision of CSR, as a public good, with the sale of a homogeneous private product, under unit demands and homogeneous consumers' attitudes towards CSR. Manasakis et al. (2013) study the effects of alternative certifying institutions, as information disclosure mechanisms of the firms' credence CSR activities,

on firms' incentives to invest in CSR as well as their relative market and societal implications. Manasakis et al. (2014), in a corporate governance context, argue that a firm's owners, by delegating the corporate management to an individually socially responsible CEO, "strategically" (Baron, 2001) exploit the manager's SR attitude and signal to consumers their commitment to voluntary CSR practices. We extend this literature by considering a MNE's CSR strategy in conjunction with its mode of entry in a host market and the respective policies.

3 The Model

We consider two countries, denoted A and B, and two firms, denoted 1 and 2. Initially, firm 1 is located in country A and firm 2 resides in country B. Firm 1 (the MNE) plans to serve country B's market, either through exports or through FDI, consisted by the establishment of a production plant at a sunk cost. On the contrary, firm 2 can neither export nor invest into the MNE's home market. Exports imply a constant cost of t per unit of the commodity exported. Naylor (1998) interprets this cost as capturing all costs associated with international trade, such as transactions, transport and tariff costs. Alternatively, the FDI consists of the establishment of a production "branch-plant" in country B at a sunk cost D (Bughin and Vannini, 1995; 2003). Equivalently, D can be interpreted as a payment, such as a license fee, for the rights to establish a plant in country B (Naylor and Santoni, 2003). On the contrary, country A's market is considered to be exogenous, since firm 2 can neither export nor invest in this market (Bughin and Vannini, 1995; 2003). Following Lommerud et al. (2003), we adopt the "segmented market hypothesis" by assuming that firm 1 chooses separate quantities for markets A and B respectively.

Each firm has the option to follow a "doing well by doing good" strategy through its engagement in CSR activities along the value chain (Porter and Kramer, 2006; 2011), in order to meet the corresponding preferences of socially conscious consumers.

On the demand side, in each country there is a *unit mass* of consumers with identical preferences on the physical characteristics of the good(s) sold. Yet, in each country, consumers are heterogeneous regarding their valuation of the firms' CSR activities. In particular, following Häckner (2000) and Garella and Petrakis (2008), the utility function of the θ-type consumer in each country is:

$$U_A(\theta_A) = (a + \theta_A s_{A_1}) x_{A_1}(\theta_A) - \frac{x^2_{A_1}(\theta_A)}{2} + m_A(\theta_A) \tag{1}$$

and

$$U_B(\theta_B) = (a+\theta_B s_{B_1}) x_{B_1}(\theta_B) + (a+\theta_B s_{B_2}) xB_2(\theta_B) - \frac{x^2_{B_1}(\theta_B) + x^2_{B_2}(\theta_B) + 2\gamma x_{B_1}(\theta_B) x_{B_2}(\theta_B)}{2} + m_B(\theta_B) \tag{2}$$

where $x_{I_i}(\theta_I)$, $I = A, B$; i, $j = 1, 2$, $i \neq j$, represents product i's quantity bought by the θ_I-type consumer in country I. $m_I(\theta_I)$ is the respective quantity of the "composite good" in country I. The price of the composite good is normalized to unity. The parameter $\gamma \in (0, 1]$ is a measure of the degree of substitutability, with $\gamma \to 0$ ($\gamma = 1$) corresponding to the case of almost independent (homogeneous) goods. Alternatively, γ may represent market competition's intensity, with a higher γ declaring higher competition.

$s_{I_i} \geq 0$ represents the CSR efforts undertaken by firm i in country I, which, in turn, increases analogously the θ_I-type consumer's valuation for its good by $\theta_I s_{I_i}$. In other words, θ_I represents the increase of the θ_I-type consumer's willingness to pay for the firm i's good per unit of its CSR effort. We assume that θ_I is distributed according to a cumulative distribution function $F(\theta_I)$, with a density function $f(\theta_I)$ and $\theta_I \in [0, 1]$. The more socially conscious a consumer is, the higher is his θ_I. A consumer who does not value the CSR activities at all is then of type $\theta_I = 0$. Then $\bar{\theta}_I = \int_0^1 \theta_I f(\theta_I) d\theta_I$ is the average consumer type in country I and $var(\theta_I) = \int_0^1 (\theta_I - \bar{\theta}_I)^2 f(\theta_I) d\theta_I$ is the degree of consumers' heterogeneity in this country. Restricting our attention to country A, we assume that θ_A is uniformly distributed in $[0, 1]$, i.e., its density function is $f(\theta_A) = 1$ for all $\theta_A \in [0, 1]$. Then $\bar{\theta}_A = 1/2$ is the average type of consumer in country A's population.

Maximization of (1) and (2) with respect to $x_{I_i}(\theta_I)$, gives the θ_I-type consumer's inverse demand functions:

$$\begin{aligned} P_{A_1} &= a + \theta_A s_{A_1} - x_{A_1}(\theta_A) \\ P_{B_i} &= a + \theta_B s_{B_i} - x_{B_i}(\theta_B) - \gamma x_{B_j}(\theta_B) \end{aligned} \tag{3}$$

By inverting (3), we obtain the θ_I-type consumer's demand functions:

$$\begin{aligned} x_{A_1}(\theta_A) &= a + \theta_A s_{A_1} - P_{A_1} \\ x_{B_i}(\theta_B) &= \frac{a(1-\gamma) + \theta_B(s_{B_i} - \gamma s_{B_j}) - P_{B_i} + \gamma P_{B_j}}{1-\gamma^2} \end{aligned} \tag{4}$$

Integrating (4) with respect to θ_I and setting $\bar{\theta}_A = 1/2$, gives the demand function for each good:

$$\begin{aligned} q_{A_1}(P_{A_1}) &= \int_0^1 x_{A_1}(\theta_A) f(\theta_A) d\theta_A = a + \frac{1}{2} s_{A_1} - P_{A_1} \\ q_{B_i}(P_{B_i}) &= \int_0^1 x_{B_i}(\theta_B) f(\theta_B) d\theta_B = \frac{a(1-\gamma) + \bar{\theta}_B(s_{B_i} - \gamma s_{B_j}) - P_{B_i} + \gamma P_{B_j}}{1-\gamma^2} \end{aligned} \tag{5}$$

Finally, by inverting (5) and assuming for simplicity reasons that $a = 1$ we obtain the firm i's inverse demand function:

$$\begin{aligned} P_{A_1} &= 1 + \frac{1}{2} s_{A_1} - q_{A_1} \\ P_{B_i} &= 1 + \bar{\theta}_B s_{B_i} - q_{B_i} - \gamma q_{B_i} \end{aligned} \tag{6}$$

Observe that firm i's inverse demand is positively related to the average consumer's type valuation $\bar{\theta}_I$ and the firm i's CSR effort level s_{I_i}. This reflects a core idea of our model, that is, socially conscious consumers' valuation for a product increases with the firm's CSR effort level. This, in turn, increases the demand for this firm's product.

We assume that both firms are endowed with identical constant returns to scale production technologies. Firm i's total cost in country I is given by $C_{I_i}(q_{I_i}, s_{I_i}) = c(1 + s_{I_i}^2) q_{I_i}$ with $0 < c < 1$. This implies that, for a given CSR effort level s_{I_i}, firm i's marginal (and unitary) cost is constant and equal to $c(1 + s_{I_i}^2)$. Following Manasakis et al. (2013; 2014), we further consider that a higher CSR effort level increases, at an increasing rate, firm i's marginal (and unitary) costs.[13, 14]

[13] This is justified on the grounds that firm i's CSR activities, such as improving working conditions for its employees, buying more expensive inputs from local suppliers, financing recycling and other SR campaigns, or introducing "green" technologies, have an increasingly negative impact on the firm's unit production costs.

[14] One could argue that CSR activities could also have benefits on firms' costs, e.g. through the introduction of "green" technologies leading to decreased expenses for costly inputs such as electricity or petrol in the long run. Incorporating these cost reductions due to firms' CSR activities will not qualitatively change our main results.

Therefore, firm 1's profit function, if it chooses to serve country B through exports, becomes:

$$\Pi_1^e = \Pi_{A_1} + \Pi_{B_1}^e = \left[P_{A_1} - c(1+s_{A_1}^2)\right] q_{A_1} + \left[P_{B_1} - c(1+s_{B_1}^2) - t\right] q_{B_1} \tag{7}$$

In the sequel we make the following assumption regarding the cost t per unit of the commodity exported, that guarantees interior solutions under all circumstances:

Assumption 1: $t^c < \frac{(2-\gamma)\left[4(1-c)+\bar{\theta}_B^2\right]}{8c}$

Assumption 1 requires that the cost t per unit of the commodity exported is not too high and is a necessary and sufficient condition in order to avoid non-existence of pure strategy equilibria.

If firm 1 decides to serve country B through FDI, its profit function becomes:

$$\Pi_1^f = \Pi_{A_1} + \Pi_{B_1}^f = \left[P_{A_1} - c(1+s_{A_1}^2)\right] q_{A_1} + \left[P_{B_1} - c(1+s_{B_1}^2)\right] q_{B_1} - D \tag{8}$$

Assuming that the sunk cost D for a "branch-plant" in country B is not too high guarantees interior solutions under all circumstances.[15]

Assumption 2: $D^c < \left[\frac{4c(1-c)+\bar{\theta}_B^2}{4c(2+\gamma)}\right]^2$

The corresponding profit function for firm 2 is given by:

$$\Pi_2 = \Pi_{B_2} = \left[P_{B_2} - c(1+s_{B_2}^2)\right] q_{B_2} \tag{9}$$

3.1 The Sequence of Moves

In this context, we consider the following game with observable actions. In the first stage of the game ("announcement stage" in the terminology of Chang et al., 2014) the two firms simultaneously and non-cooperatively commit on whether or not to undertake CSR activities.[16] Given the firms' mission statements, in the second stage, country B's government, through the

[15] As in Bughin and Vannini (1995; 2003), we restrict our analysis to the case where both firms produce a strictly positive quantity in equilibrium. The case of monopoly is purposely neglected here, since we want to focus on the strategic interactions arising in duopoly.

[16] This strategy can be represented in the firm's "mission statement" picked by its owners (Besley and Ghatak, 2005; 2007; Manasakis et al., 2014).

corresponding policy maker, determines its policy for the MNE so as to maximize national total welfare. In the third stage of the game, firm 1 decides whether to serve country B through exports or by investing in a production "branch-plant" in country B. In the fourth stage of the game the two firms undertake the missioned CSR activities. In the last stage, firms compete in the market by setting their quantities, and consumers make their purchases according to their type towards CSR and the firms' CSR activities undertaken in the previous stage. The game structure reflects a ranking of decisions in terms of flexibility. It is normal to postulate that firm 1 decides how to serve country B, given this country's governmental policy.[17] We solve the game by employing the Subgame Perfect Nash Equilibrium (SPNE) solution concept.

3.2 The benchmark case: No CSR Activities

We begin our analysis by briefly presenting the benchmark (b) case where both firms decide not to undertake CSR activities.

3.2.1 Firm 1 exports to country B

Consider the case where firm 1 chooses to serve country B through exports (e). The corresponding profit functions are given by: $\Pi_{B_1}^{be} = (1 - q_{B_1} - \gamma q_{B_2} - c - t)q_{B_1}$ and $\Pi_2^{be} = (1 - q_{B_2} - \gamma q_{B_1} - c)q_{B_2}$. From the first order conditions, the corresponding reaction functions are: $R_{B_1}^{be}(q_{B_2}) = \frac{1-c-t-\gamma q_{B_2}}{2}$ and $R_2^{be}(q_{B_1}) = \frac{1-c-\gamma q_{B_1}}{2}$.

Regarding country A, the equilibrium firm 1's output, price and profits are: $q_{A_1}^{be} = \frac{1-c}{2}$, $p_{A_1}^{be} = \frac{1+c}{2}$, $\Pi_{A_1}^{be} = (q_{A_1}^{be})^2$. Consumers' surplus and total welfare in country A are given by $CS_A^{be} = \frac{1}{2}(q_{A_1}^{be})^2$ and $TW_A^{be} = CS_A^{be} + \Pi_{A_1}^{be} + \Pi_{B_1}^{be}$ respectively (see Appendix 1). Regarding country B, the equilibrium tariff set by the policy maker is $t^b = \frac{1-c}{3}$. Firm-level output, price and profits are: $q_{B_1}^{be} = \frac{(1-c)(4-3\gamma)}{3(4-\gamma^2)}$, $q_{B_2}^{be} = \frac{2(1-c)(3-\gamma)}{3(4-\gamma^2)}$, $p_{B_1}^{be} = \frac{8+c[4+\gamma(3-2\gamma)]-\gamma(3+\gamma)}{3(4-\gamma^2)}$, $p_{B_2}^{be} = c + \frac{1-c}{6(2-\gamma)} + \frac{5(1-c)}{6(2+\gamma)}$, $\Pi_{B_1}^{be} = (q_{B_1}^{be})^2$, $\Pi_{B_2}^{be} = (q_{B_2}^{be})^2$.

Since all consumers have identical preferences over the physical characteristics of the two goods and there is a unit mass of them in the population, it turns out that each consumer in country B buys a quantity $x_{I_i}^{be} = q_{I_i}^{be}$ from each good. Then, consumers' surplus and

[17] In Section 6, we consider the case where country B's policy maker determines its optimal tariff rate after the MNE's decision whether to serve country B through exports or by investing in a production branch-plant there.

total welfare in this country are given by $CS_B^{be} = \frac{1}{2}\left[(q_{B_1}^{be})^2 + (q_{B_2}^{be})^2 + 2\gamma q_{B_1}^{be} q_{B_2}^{be}\right]$ and $TW_B^{be} = CS_B^{be} + \Pi_{B_2}^{be} + t(q_{B_1}^{be})$ respectively (see Appendix 1).

3.2.2 Firm 1 invests in country *B*

We now consider the scenario where firm 1 chooses to serve country B through FDI (f). The corresponding profit functions are: $\Pi_{B_1}^{bf} = (1 - q_{B_1} - \gamma q_{B_2} - c)q_{B_1} - D$ and $\Pi_2^{bf} = (1 - q_{B_2} - \gamma q_{B_1} - c)q_{B_2}$. The respective reaction functions are $R_{B_i}^{bf}(q_{B_j}) = \frac{1-c-\gamma q_{B_j}}{2} i$, $j = 1, 2$, $i \neq j$.

Regarding country A, the equilibrium firm 1's output, price and profits as well as consumers' surplus are equal to the respective ones under exports. Total welfare in country A is given by $TW_A^{bf} = CS_A^{bf} + \Pi_{A_1}^{bf} + \Pi_{B_1}^{bf}$ (see Appendix 1). The corresponding equilibrium outputs, prices and profits in country B are: $q_{B_i}^{bf} = \frac{1-c}{2+\gamma}$, $p_{B_i}^{bf} = \frac{1+c(1+\gamma)}{2+\gamma}$, $\Pi_{B_1}^{bf} = (q_{B_1}^{bf})^2 - D$, $\Pi_{B_2}^{bf} = (q_{B_2}^{bf})^2$.

As above, each consumer buys a quantity $x_{I_i}^{bf} = q_{I_i}^{bf}$ from each good. Then, consumers' surplus and total welfare in country B are $CS_B^{bf} = \frac{1}{2}[(q_{B_1}^{bf})^2 + (q_{B_2}^{bf})^2 + 2\gamma q_{B_1}^{bf} q_{B_2}^{bf}]$ and $TW_B^{bf} = CS_B^{bf} + \Pi_{B_2}^{bf}$ respectively (see Appendix 1).

Regarding firm 1's choice between exporting or investing in country B, we define $D^b = \frac{4(1-c)^2(5-3\gamma)}{9(\gamma^2-4)}$ as the value of D that equalizes the MNE profit in the export and the FDI cases. For values $D > D^b$ ($D < D^b$), the MNE will prefer to export (establish a production branch-plant) in country B.[18] Notice that when products become closer substitutes (higher γ, i.e., competition becomes fiercer), firm 1's profits when investing in country B decrease, implying that firm 1's incentive to export becomes relatively stronger.

Note also that exports *always* lead to lower consumers' surplus and higher total welfare rather than the FDI, i.e., $CS_B^{be} < CS_B^{bf}$ and $TW_B^{be} > TW_B^{bf}$. Intuitively, the tariff charged to firm 1 reduces its quantity exported to country B ($q_{B_1}^{be} < q_{B_1}^{bf}$) and consumers' surplus in this country, relative to the FDI case. At the same time, the tariff revenues for country B increase its total welfare relative to the FDI case.

[18] Importantly, we impose $D^b \geq 0$, i.e. the MNE indeed has to pay something to invest in country B.

4 Equilibrium Analysis

4.1 Firm 1 exports to country B

In this subsection we consider the case where firm 1, given the country B's policy set in the second stage of the game, serves country B through exports (e).

In the last stage, firm 1 (2), taking as given the output of firm 2 (1), chooses the quantity to maximize its profits, given by (7) [(9)].

Hence, the first order condition of the MNE's and firm 2's profits leads to the respective reaction functions:

$$R^e_{B_1}(q_{B_2}, s_{B_1}) = \frac{1 - c - \gamma q_{B2} - t}{2} + \frac{s_{B_1}(\bar{\theta}_B - c s_{B_1})}{2} \tag{10}$$

$$R^e_{B_2}(q_{B_1}, s_{B_2}) = \frac{1 - c - \gamma q_{B_1}}{2} + \frac{s_{B_2}(\bar{\theta}_B - c s_{B_2})}{2} \tag{11}$$

Comparing $R^e_{B_1}(q_{B_2}, s_{B_1})$ and $R^e_{B_2}(q_{B_1}, s_{B_2})$ with the corresponding reaction functions from the benchmark scenario, $R^{be}_{B_1}(q_{B_2})$ and $R^{be}_2(q_{B_1})$ respectively, we observe that in the former case, there is an additional term capturing two opposing effects of firm i's CSR investments on its best-response output. An increase in CSR investment increases the demand for firm i's good by $\bar{\theta}_B$, resulting to an increase in output and profits, and at the same time incurs a higher cost for firm i by cs^2_{Bi}, tending to decrease its output and profits. Second, since $\partial R^e_{B_i}/\partial s_{B_i} = \left(\bar{\theta}_B - 2cs_{Bi}\right)/2$, firm i's best response output has an inverted U-shaped relation with its CSR efforts, with the maximum attained at $s_{Bi} = \bar{\theta}_B/2c$. This is so, because for a relatively low level of CSR efforts ($s_{Bi} < \bar{\theta}_B/2c$), the positive demand effect dominates the negative unit cost effect. The opposite is true for $s_{Bi} > \bar{\theta}_B/2c$. In fact, whenever $s_{Bi} > \bar{\theta}_B/2c$, firm i's reaction function shifts in, as compared with the respective one in the benchmark case. Intuitively, as in $R^{be}_{B_1}(q_{B_2})$, the level of subsidy or tariff t is negatively connected to the output of firm 1.

Solving the system of first order conditions, and after some manipulations, we obtain each firm's output:

$$q^e_{B_1}(s_{B_1}, s_{B_2}) = \frac{2\left(\bar{\theta}_B s_{B_1} + 1\right) - \gamma(\bar{\theta}_B s_{B_2} + 1) - c[2(1 + s^2_{B_1}) - \gamma(1 + s^2_{B_2})] - 2t}{4 - \gamma^2} \tag{12}$$

$$q^e_{B_2}(s_{B_1}, s_{B_2}) = \frac{2(\bar{\theta}_B s_{B_2} + 1) - \gamma(\bar{\theta}_B s_{B_1} + 1) - c[2(1 + s^2_{B_2}) - \gamma(1 + s^2_{B_1})] + \gamma t}{4 - \gamma^2} \tag{13}$$

In the third stage, each firm sets its amount of CSR efforts so as to maximize own profits, given by $\Pi^e_{B_i}(s_{B_1}, s_{B_2}) = \left[q^e_{B_i}(s_{B_1}, s_{B_2})\right]^2$. Solving the system of the first order conditions of $\Pi^e_{B_1}(s_{B_1}, s_{B_2})$ and $\Pi^e_{B_2}(s_{B_1}, s_{B_2})$, with respect to s_{B_1}, s_{B_2}, the firm-level equilibrium amount of CSR efforts in country B is:

$$s_e = s^e_{B_1} = s^e_{B_2} = \frac{\bar{\theta}_B}{2c} \tag{14}$$

By substituting (14) in (12) and (13) we get the respective firm i's output level and profits:

$$q^e_{B_1}(t) = \frac{(2 - \gamma)[4c(1 - c) + \bar{\theta}^2_B] - 8ct}{4c(4 - \gamma^2)}; \quad q^e_{B_2}(t) = \frac{(2 - \gamma)[4c(1 - c) + \bar{\theta}^2_B] + 4\gamma ct}{4c(4 - \gamma^2)} \tag{15}$$

$$\Pi^e_{B_1}(t) = \left[q^e_{B_1}(t)\right]^2; \quad \Pi^e_{B_2}(t) = \left[q^e_{B_2}(t)\right]^2 \tag{16}$$

In the second stage of the game, country B's policy maker determines its optimal subsidy or tariff rate t^e so as to maximize national total welfare, which is consisted by firm 2's profits and country B's consumers' surplus increased (decreased) by tariff revenue (subsidy expenses).

Given that the utility function of the θ-type consumer in country B is given by eq. (2), country B's consumers surplus is:

$$CS^e_B(t) = U_B(\theta_B) - P_{B_1} x_{B_1}(\theta_B) - P_{B_2} x_{B_2}(\theta_B) \tag{17}$$

Substituting $P_{B_i} = a + \theta_B s_{B_i} - x_{B_i}(\theta_B) - \gamma x_{B_j}(\theta_B)$, exploiting symmetry ($s_e = s^e_{B_1} = s^e_{B_2}$) and after some manipulations, we find that:[19]

$$CS^e_B(t) = \frac{1}{2}\left[\left[q^e_{B_1}(t)\right]^2 + \left[q^e_{B_1}(t)\right]^2 + 2\gamma q^e_{B_1}(t) q^e_{B_2}(t)\right] + \frac{var(\theta_B) s^2_e}{(1 + \gamma)} \tag{18}$$

Then, country B's total welfare is given by:

$$TW^e_B(t) = CS^e_B(t) + \Pi^e_{B_2}(t) + t q^e_{B_1}(t) \tag{19}$$

Country B's policy maker determines the optimal policy by maximizing total welfare with

[19] For the detailed derivation of $CS^e_B(t)$, see Appendix 2A.

resect to t, which gives the socially optimal tariff t^e:

$$t^e = \frac{1}{12}\left[4(1-c) + \frac{\bar{\theta}_B^2}{c}\right] \tag{20}$$

Note that $t^e < t^c$ always holds. Using t^e, we obtain each firm's equilibrium output, price and profits, as well as consumers' surplus and total welfare (see Appendix 2B).

The configuration under study is an equilibrium only if no firm has incentives to deviate by not undertaking CSR activities. Let firm 2 stick to s_e while firm 1 deviates by choosing $s^e_{B_1} = 0$. Using (7), firm 1's deviation profits in country B are $\Pi^{ed}_{B_1} < \Pi^e_{B_1}$ always. Intuitively, firm 1's cost savings, because of $s^e_{B_1} = 0$, do not compensate for the revenue losses due to the decreased consumers' valuation for its product.[20]

Note that $\frac{ds_e}{d\theta_B} > 0$ and $\frac{ds_e}{dc} < 0$, as well as $\frac{dq^e_{I_i}}{d\theta_I} > 0$ and $\frac{dq^e_{I_i}}{dc} < 0$, $\forall$ I and i always hold, implying that the equilibrium CSR effort and output increase with the degree of social consciousness of the average consumer type in country I, as well as with the efficiency of the CSR (and output) "production technology" (captured by a lower c). This is so because the higher the social consciousness of the average consumer, the higher is the population's willingness to pay and the demand for CSR related products. This has two opposite results. First, firm i spends more on CSR activities and sets a higher level of output. Second, it is precisely this output expansion which increases production costs that tend to decrease firm i's profits. The former effect is the dominant and hence, CSR effort and output increase as $\bar{\theta}_I$ increases. An increase in the efficiency of the production technology, i.e., a reduction in c has similar effects. Note also that as country B's population increases its willingness to pay, country B's policy maker charges a higher tariff to the MNE. A reduction in c has similar effects too. It can also be checked from $\frac{d\Pi^e_{I_i}}{d\theta_B}$ that firm i's equilibrium profits follow a similar pattern in $\bar{\theta}_I$ and c.

Moreover, $CS^e_I > CS^{be}_I$ because $s_e > 0$; $q^e_{I_i} > q^{be}_{I_i}$, $\forall$ I and i. Given that $TW^e_A = CS^e_A + \Pi^e_{A_1} + \Pi^e_{B_1}$ and $TW^e_B = CS^e_B + \Pi^e_{B_2} + tq^e_{B_1}$, and as long as all the three terms in TW^e_I are higher rather than under no CSR activities, it holds that $TW^e_I > TW^{be}_I$, $\forall$ I. Ceteris paribus, an increase in the variance of social consciousness in a country's population increases both

[20] Note that the case where none firm undertakes CSR activities is not an equilibrium configuration either. Firm j's optimal response to firm i's abstaining from CSR activities is to invest in CSR activities and obtain a competitive advantage in country B's market.

the CS and TW. This is due to the fact that a more heterogeneous consumers' population makes more dissimilar purchasing decisions. The utility gain of the highly conscious consumers overcompensates for the utility loss of the less conscious consumers and CS is higher than under a more homogeneous population.

Our findings are summarized in the following Proposition:

Proposition 1 *When firm* 1 *exports to country* B*:*

(i) In equilibrium both firms undertake CSR efforts $s_e = \frac{\bar{\theta}_B}{2c}$*.*

(ii) Consumers' surplus and total welfare are higher rather than under no CSR activities.

(iii) Equilibrium CSR effort, output, profits, tariff, consumers' surplus and total welfare increase when the average consumer type is more socially conscious (higher $\overline{\theta}$*), as well as when the CSR "production technology" is more efficient (lower* c*).*

4.2 Firm 1 invests in country B

We proceed our analysis by assuming that firm 1 serves country B through FDI (f), consisted by the establishment of a production plant at a sunk cost in this country.

In the last stage, the two firms compete in country B's market by setting q_{B_i} so as to maximize their profits given by (8) and (9). From the first order conditions, the corresponding reaction functions are:

$$R^f_{B_i}(q_{B_j}, s_{B_i}) = \frac{(1 - c - \gamma q_{B_j})}{2} + \frac{s_{B_i}(\bar{\theta}_B - c s_{B_i})}{2} \tag{21}$$

Comparing $R^f_{B_i}(q_{Bj}, s_{Bi})$ with the respective from the benchmark case $R^{bf}_{B_i}(q_{Bj})$, firm i's best response output has an inverted U-shaped relation with its CSR efforts, with the maximum attained at $s_i = \bar{\theta}_B/2c$, similarly to the exports case.

Solving the system of first order conditions, and after some manipulations, we obtain firm i's output:

$$q^f_{B_i}(s_{B_i}, s_{B_j}) = \frac{2(1 + \bar{\theta}_B s_{B_i}) - \gamma(1 + \bar{\theta}_B s_{B_j}) - c[2(1 + s^2_{B_i}) - \gamma(1 + s^2_{B_j})]}{4 - \gamma^2} \tag{22}$$

In the third stage, both firms choose the level of CSR investments that maximizes their profits given by $\Pi^f_{B_1}(s_{B_1}, s_{B_2}) = [q^f_{B_1}(s_{B_1}, s_{B_2})]^2 - D$ and $\Pi^f_{B_2}(s_{B_1}, s_{B_2}) = [q^f_{B_2}(s_{B_1}, s_{B_2})]^2$

respectively. Solving the system of the first order conditions, with respect to s_{B_1}, s_{B_2}, the firm-level equilibrium amount of CSR efforts in country B is:

$$s_f = s^f_{B_1} = s^f_{B_2} = \frac{\bar{\theta}_B}{2c} \tag{23}$$

By substituting (23) into (22), we obtain firm i's output and profits:

$$q^f_{B_i} = \frac{4c(1-c) + \bar{\theta}^2_B}{4c(1+\gamma)}; \quad \Pi^f_{B_1} = \left(q^f_{B_1}\right)^2 - D; \quad \Pi^f_{B_2} = \left(q^f_{B_2}\right)^2 \tag{24}$$

Then, consumers' surplus and total welfare in market B are:[21]

$$CS^f_B = (1+\gamma)\left(q^f_{B_i}\right)^2 + \frac{var(\theta_B)s^2_f}{(1+\gamma)} \tag{25}$$

and

$$TW^f_B = CS^f_B + \Pi^f_{B_2} = (2+\gamma)\left(q^f_{B_i}\right)^2 + \frac{var(\theta_B)s^2_f}{(1+\gamma)} \tag{26}$$

Using $q^f_{B_i}$, we obtain each firm's equilibrium price and profits, as well as consumers' surplus and total welfare (see Appendix 3B).

Here too, in equilibrium both firms undertake CSR efforts. It also holds that $CS^f_I > CS^{bf}_I$ and $TW^f_I > TW^{bf}_I$, $\forall\ I$. Moreover, the equilibrium CSR effort and output increase with the degree of social consciousness of the average consumer type in country I, as well as when the CSR (and output) "production technology" becomes more efficient.

We also consider that country B's government can offer a "fixed" subsidy S, financed through lump-sum taxes, in order to attract inward FDI, but only if it increases the national total welfare. Let us define K as the difference in firm 1's gross profits between exports and FDI, i.e., $K = \left(q^e_{B_1}\right)^2 - \left(q^f_{B_1}\right)^2$. The following Proposition summarizes:

Proposition 2 *(i) If $D < K$ ($D > K$), firm 1's serves (does not serve) the host country through FDI without the need of any subsidy (unless a subsidy $S > 0$ is offered).*

(ii) The subsidy S has to be equal to the sunk cost increased by the difference in firm 1's gross profits between exports and FDI, i.e., $S = D + K$.

Note also that the qualitative results stated in Proposition 1 hold here too.

[21] For the detailed derivation of CS^f_B, see Appendix 3A.

5 The MNE's choice: Exports versus FDI

Let us now focus on the third stage of the game, on firm 1's decision whether to serve country B through exports or by investing in a production branch-plant there. We define $D^f = \frac{\left[\bar{\theta}_B^2+4c(1-c)\right]^2(5-3\gamma)}{36c^2(4-\gamma^2)^2}$ as the value of D that equalizes the MNE net profit in the export and the FDI cases. For values $D < D^f$, the MNE will prefer to invest in country B rather than export.

Two observations are in order: First, $\frac{dD^f}{d\bar{\theta}_B} > 0$, i.e., the higher the consumers' valuation for CSR in country B , the higher the amount that firm 1 affords to invest in a branch-plant so as to produce its product $q_{B_1}^f$ locally. Intuitively, an increase in the social consciousness of the average consumer, increases the population's willingness to pay and the demand for CSR related products. The positive output expansion effect dominates the negative production cost effect and firm 1's profits increase. Second, $\frac{dD^f}{d\gamma} < 0$ suggests that as the goods become less differentiated (higher γ), market competition in country B becomes fiercer and firms' profits decrease. This reduces the MNE's maximum affordable sunk cost for the FDI.

Note also that ceteris paribus, $D^f > D^b$ always holds. Intuitively, since firm 1's CSR activities increase its profits, the firm can pay a relatively higher sunk cost D for the establishment of a branch-plant in country B. This extra cost increases in the social consciousness of country B's average consumer, i.e., $\frac{d\left(D^f-D^b\right)}{d\bar{\theta}_B} > 0$. The following Proposition summarizes:

Proposition 3 *(i) The MNE will choose to serve the host country through FDI rather than through exports, if and only if the sunk cost for the establishment of a production plant is sufficiently low, i.e., $D < D^f$.*

(ii) The critical level of the sunk cost increases when: (i) the average consumer type in the host country is more socially conscious (higher $\bar{\theta}_B$); the goods are highly differentiated and the market competition becomes less fierce (lower γ).

(iii) The MNE's maximum affordable sunk cost for serving the host country through FDI, is higher when the MNE undertakes CSR activities rather than under no CSR activities, i.e., $D^f > D^b$ always holds.

However, nothing guarantees that firm 1's optimal strategy, depending on $D \gtrless D^f$, is compatible with the highest consumers' surplus and total welfare from the host-country's viewpoint. By comparing consumers' surplus in market B under the FDI and the exports and cases, we find that it will always be higher in the former case rather than in the latter, i.e.,

$CS_B^f > CS_B^e$. The intuition here is straightforward: Firstly, the MNE's exported quantity in market B is lower than its quantity produced there under FDI, i.e., $q_{B_1}^e < q_{B_1}^f$. This is so because the tariff charged by country B's policy maker reduces the exporting quantity relative to the one produced in country B. On the contrary, in the FDI case, the cost D does not affect the equilibrium quantities and therefore, the MNE and the host firm produce symmetric quantities. Secondly, precisely because of the fiercer market competition in the FDI case, the firm 2's quantity is higher under FDI than under exports, i.e., $q_{B_2}^e < q_{B_2}^f$. Hence, total output in market B is always higher under FDI than under exports.

Regarding total welfare in country B, interestingly, we find that it is always higher under exports than under FDI. Intuitively, there two opposite effects now: First, according to Proposition 2, consumers' surplus in country B is always lower under exports rather than under FDI. Yet, the relatively less fierce market competition in the exports case keeps firm 2's profits always higher under exports rather than under FDI, i.e., $\Pi_{B_2}^e > \Pi_{B_2}^f$. This effect of profits becomes stronger due to tariff revenues on country B's total welfare under exports. It proves that this latter effect is always the dominant. The following Proposition summarizes:

Proposition 4 *(i) Consumers' surplus in the host country is always higher under FDI than under exports.*

(ii) Total welfare in the host country is always higher under exports than under FDI.

Note that whether a host country's policy maker prefers to attract imports or FDI depends on its welfare standard: If the policy maker is interested to benefit consumers relatively more, it has to keep the sunk cost D for FDI at a relatively low level (e.g., through subsidization), i.e., $D < D^f$, so as to attract FDI. On the contrary, if the welfare standard is total welfare, it may need to increase the sunk cost D, so as to attract imports relatively to FDI.

Independently of whether the MNE serves the host country through exports or FDI, two additional observations are in order. First, there is compatibility between market and social incentives for the MNE's CSR activities. The MNE, by investing in CSR activities, increases its profitability due to the positive demand effect of CSR. At the same time, consumers' surplus and total welfare are enhanced due to the fact that the MNE satisfies consumers' demand for SR products. Second, policy makers should take measures to promote CSR activities, e.g. by raising consumers' awareness on social and environmental issues; building capacities for CSR; improving disclosure, transparency and the quality of CSR reports; facilitating socially

responsible investment (SRI) (Steurer, 2010).[22]

Regarding country A, we find that total welfare is higher under FDI than under exports, if and only if the sunk cost D for the FDI is sufficiently low, i.e., $D < D^f$. Intuitively, recall that $TW_A^m = CS_A^m + \Pi_{A_1}^m + \Pi_{B_1}^m$, $m = e, f$. In country A, $CS_A^e = CS_A^f$ and $\Pi_{A_1}^e = \Pi_{A_1}^f$ always hold. Yet, $\Pi_{B_1}^e > \Pi_{B_1}^f$ if and only if $D < D^f$. The following Proposition summarizes:

Proposition 5 *Total welfare in the MNE's country is higher under FDI rather than under exports, if and only if D is sufficiently low, i.e., $D < D^f$.*

Hence, if country A's policy maker wants to increase national total welfare, it has to promote the MNE's expansion through the subsidization of the fixed cost of a production branch-plant abroad.

6 Extensions - Discussion

In this section we examine a number of modifications of the basic model in order to briefly discuss the robustness of our main results.[23]

6.1 Reversal of moves by the MNE and the host government

In the basic model we have assumed that country B's policy maker determines its optimal tariff rate before the MNE's decision whether to serve country B through exports or by investing in a production branch-plant there (*ex ante* scenario). We now consider the case where country B's policy maker sets its optimal tariff rate *ex post*. This is motivated by evidence cited in Neary (1994), suggesting that the ex post timing of moves is frequently adopted in practice because governments do not always precommit to a tariff, whereas firms precommit to their strategies. The equilibrium of the ex-post game is summarized in the following Proposition:

Proposition 6 *When the host country's policy maker sets the tariff rate after the MNE's decision how to serve the host country:*

[22] This is in line with the latest policy initiatives of the European Commission (2011): "...the Commission will step up its cooperation with Member States, partner countries and relevant international fora to promote respect for internationally recognised principles and guidelines, and to foster consistency between them. This approach also requires EU enterprises to renew their efforts to respect such principles and guidelines."

[23] For each extension discussed below, the detailed analysis is available from the authors upon request.

(i) The MNE will choose to serve the host country through FDI rather than through exports, if and only if $D < D^t$, with $D^t > D^f$.

(ii) Independently the MNE's choice on how to serve the host country, in equilibrium both firms undertake CSR efforts $s_t = \frac{\bar{\theta}_B}{2c}$.

We define $D^t = \frac{t\left[(2-\gamma)\left(4c(c-1)-\bar{\theta}_B^2\right)-4ct\right]}{[6c(4-\gamma^2)]^2}$ as the value of D that equalizes the MNE profit in the export and the FDI cases. Note that in the ex post scenario, the critical value of the FDI's fixed cost is higher than the respective in the ex ante scenario. In the ex post scenario, when the MNE decides how to serve the host country, it simply anticipates the tariff rate that will be set in the next stage. Interestingly, we find that firms' profit-maximizing CSR efforts are independent of timing of moves. Yet, the reversal of moves between the MNE and the host country's policy maker may change the MNE's decision on its mode on entry in the host country which, in turn, will effect consumers' surplus and total welfare.

6.2 International total welfare

In the basic model we have assumed that country B's policy maker sets its optimal tariff rate so as to maximize the national total welfare. However, it is evident that national and international total welfare do not always coincide (see for instance, Lommerud et al., 2003; Skaksen 2005). Moreover, there is an ongoing discussion demonstrating an interest by firms, policymakers and activists in "experimenting with links between voluntary CSR initiatives and trade policies" (Aaronson, 2007) so as to promote trade and global CSR. In this context, the question is whether this link can be materialized without distorting trade. For this reason, we now consider the case where, in the second stage, the optimal trade policy (subsidy or tariff) is set by an international authority in order to maximize international total welfare, defined as the sum of total welfare in countries A and B:

$$ITW(t) = TW_A^e(t) + TW_B^e(t) \tag{27}$$

where $TW_A^e(t) = CS_A^e(t) + \Pi_{A_1}^e(t) + \Pi_{B_1}^e(t)$ and $TW_B^e(t) = CS_B^e(t) + \Pi_{B_2}^e(t)$.

By maximizing international total welfare with respect to t, we obtain the internationally optimal tariff t^i:

$$t^i = \frac{(3+\gamma)(2-\gamma)^2\left[4c(1-c)+\bar{\theta}_B^2\right]}{4c(12-\gamma^2)} \tag{28}$$

Note that $t^i > t^e$ always holds. Using t^i, we obtain each firm's equilibrium CSR effort, output, price and profits, as well as consumers' surplus and total welfare for each country (see Appendix 4).

Comparing equilibrium outcomes when country B's policy maker sets the tariff (t^e) with the respective when the tariff is set by an international authority (t^i), the following Proposition summarizes:

Proposition 7 *(i) Firm 1's (Firm 2's) output level and profits in country B are lower (higher) under the international authority's tariff.*

(ii) Total output level in country B and consumers' surplus in country B are lower under the international authority's tariff.

(iii) Total welfare in country A and in country B are lower under the international authority's tariff.

(iv) When the tariff is set by an international authority, the MNE will choose to serve the host country through FDI rather than through exports, if and only if $D < D^i$, with $D^i > D^f$.

Intuitively, in order to maximize international total welfare, the relevant authority charges a relatively higher tariff, as compared to the respective maximizing country B's total welfare. This decreases firm 1's quantity exported in country B and the resulting profits and increases firm 2's respective values. Despite firm 2's output increase, firm 1's quantity decrease dominates and hence, total output and consumers' surplus in country B are lower under the international authority's tariff. Then, the positive effect of the international authority on firm 2's profits does not compensate its negative effect on country B's consumers' surplus and hence, total welfare in country B is lower under the international authority's tariff. Further, for $D < D^i = \frac{(2+\gamma)(3+\gamma)(6+\gamma)\left[4c(1-c)+\bar{\theta}_B^2\right]^2}{36c^2(4-\gamma^2)^2}$ the MNE will prefer to invest in country B instead of serving this market through exports. Interestingly, $D^i > D^f$ always holds. Intuitively, since the international authority's tariff decreases firm 1's profits from exports, the maximum sunk cost D for the MNE, so as to serve the host country through FDI, increases in this case too.

Interestingly, observe that the international authority's tariff is beneficial for firm 2 solely, implying that this firm would have incentives to put pressure, e.g. through lobbying, for the

establishment of this policy. Such a strategy raises firm 1's unit cost of export, imposing a barrier to entry in country B's market.

7 Conclusion

The present paper has been motivated by the fact that CSR is now undeniably a mainstream business practice for MNEs worldwide. We have investigated the market and societal effects of a SR MNE's entry in a host market through exports and through FDI; the determinants of the MNE's decision between exports and FDI, as well as the respective host country's policies.

Our main finding is that each firm, seeking for a competitive advantage in the market, strategically engages in CSR activities and meets the socially conscious consumers' demand. The MNE, independently of the mode of entry, increases its output, price and profits by exploiting those consumers' relatively higher willingness to pay for SR products. Whether the FDI is preferred or not depends on the level of sunk cost for the establishment of a production plant. Moreover, firms' CSR activities increase consumers' surplus and total welfare, implying that CSR is welfare enhancing and should be encouraged. Regarding the policy tools of the host country's policy maker, if the MNE chooses to serve the host country through exports, the tariff charged increases with the social consciousness of this country's consumers. If the MNE chooses to establish a production plant in the host country, its policy maker can offer a "fixed" subsidy equal to the sunk cost of the FDI increased by the difference in the MNE's gross profits between exports and FDI.

In our analysis we have assumed that the firm located in the host country can neither export nor invest into the MNE's home market. An interesting direction for future research would be to investigate how our results may change if we cancel this assumption and give space for strategic trade policy. Another direction for future research would be to study the case where two foreign firms can sell, either through exports and through FDI, a differentiated good in a third country's market and the relevant policy options.

Appendix

Appendix 1

Firm 1 exports to country B

$CS_A^{be} = \frac{(1-c)^2}{8}$

$TW_A^{be} = \frac{(1-c)^2\left[560-3\gamma\left(64+48\gamma-9\gamma^3\right)\right]}{72(4-\gamma^2)^2}$

$CS_B^{be} = \frac{(1-c)^2\left[52-3\gamma^2(13-4\gamma)\right]}{18(4-\gamma^2)^2}$

$TW_B^{be} = \frac{(1-c)^2(13-6\gamma)}{6(4-\gamma^2)}$

Firm 1 invests in country B

$CS_B^{bf} = \frac{(1-c)^2}{8}$

$TW_B^{bf} = \frac{3(1-c)^2}{8} + \frac{(1-c)^2}{(2+\gamma)^2} - D$

$CS_B^{bf} = \frac{(1-c)^2(1+\gamma)}{(2+\gamma)^2}$

$TW_B^{bf} = \frac{(1-c)^2}{2+\gamma}$

Appendix 2A

Country B's consumers' surplus when firm 1 exports in country B:

$CS_B^e(\theta_B) = (a+\theta_B s_{B_1})x_{B_1}(\theta_B) + (a+\theta_B s_{B_2})x_{B_2}(\theta_B) - \frac{x_{B_1}^2(\theta_B)+x_{B_2}^2(\theta_B)+2\gamma x_{B_1}(\theta_B)x_{B_2}(\theta_B)}{2} - P_{B_1}x_{B_1}(\theta_B) - P_{B_2}x_{B_2}(\theta_B)$ [1]

Substituting $P_{B_i} = a + \theta_B s_{B_i} - x_{B_i}(\theta_B) - \gamma x_{B_j}(\theta_B)$, it holds that:

$CS_B^e(\theta_B) = (a+\theta_B s_{B_1})x_{B_1}(\theta_B) + (a+\theta_B s_{B_2})x_{B_2}(\theta_B) - \frac{x_{B_1}^2(\theta_B)+x_{B_2}^2(\theta_B)+2\gamma x_{B_1}(\theta_B)x_{B_2}(\theta_B)}{2}$

$-x_{B_1}(\theta_B)[a+\theta_B s_{B_1} - x_{B_1}(\theta_B) - \gamma x_{B_2}(\theta_B)] - x_{B_2}(\theta_B)[a+\theta_B s_{B_2} - x_{B_2}(\theta_B) - \gamma x_{B_1}(\theta_B)] \Rightarrow$

$CS_B^e(\theta_B) = \frac{1}{2}\left[x_{B_1}^2(\theta_B) + x_{B_2}^2(\theta_B) + 2\gamma x_{B_1}(\theta_B)x_{B_2}(\theta_B)\right]$ [2]

In equilibrium, there is symmetry in CSR activities, i.e., $s_{B_1} = s_{B_2} = s_e$. Hence,

$CS_B^e(\theta_B) = \frac{1}{2}\int_0^1 [x_{B_1}^2(\theta_B) + x_{B_2}^2(\theta_B) + 2\gamma x_{B_1}(\theta_B)x_{B_2}(\theta_B)]f(\theta_B)d\theta_B$

$= \frac{1}{2}\int_0^1 x_{B_1}^2(\theta_B)f(\theta_B)d\theta_B + \frac{1}{2}\int_0^1 x_{B_2}^2(\theta_B)f(\theta_B)d\theta_B + \gamma\int_0^1 x_{B_1}(\theta_B)x_{B_2}(\theta_B)f(\theta_B)d\theta_B$ [3]

Moreover, we know that $x_{B_i}(\theta_B) = \frac{a(1-\gamma)+\theta_B(s_{B_i}-\gamma s_{B_j})-P_{B_i}+\gamma P_{B_j}}{1-\gamma^2}$ and $P_{B_i} = 1 + \bar{\theta}_B s_{B_i} - q_{B_i} - \gamma q_{B_i}$

Hence, it holds that $x_{B_i}(\theta_B) = q_{B_i}(t) + \frac{(\theta_B-\bar{\theta}_B)s_e}{1+\gamma}$

Then,

$\frac{1}{2}\int_0^1 x_{B_1}^2 f(\theta_B)d\theta_B = \frac{1}{2}\int_0^1 q_{B_1}^2 f(\theta_B)d\theta_B + \frac{1}{2(1+\gamma)^2}\int_0^1(\theta_B-\bar{\theta}_B)^2 s_e^2 f(\theta_B)d\theta_B + \frac{1}{1+\gamma}\int_0^1 q_{B_1}(\theta_B-\bar{\theta}_B)s_e f(\theta_B)d\theta_B$

and since $\int_0^1 q_{B_1}(\theta_B-\bar{\theta}_B)s_e f(\theta_B)d\theta_B = 0$; $\int_0^1(\theta_B-\bar{\theta}_B)^2 s_e^2 f(\theta_B)d\theta_B = var(\theta_B)s_e^2$

it holds that: $\frac{1}{2}\int_0^1 x_{B_i}^2 f(\theta_B)d\theta_B = \frac{1}{2}q_{B_i}^2 + \frac{var(\theta_B)s_e^2}{2(1+\gamma)^2}$

Moreover, $\gamma\int_0^1 x_{B_1}(\theta_B)x_{B_2}(\theta_B)f(\theta_B)d\theta_B = \gamma\left[q_{B_1}q_{B_2} + \frac{var(\theta_B)s_e^2}{(1+\gamma)^2}\right]$

Hence, $CS_B(\theta_B) = \frac{1}{2}q_{B_1}^2 + \frac{var(\theta_B)s_e^2}{2(1+\gamma)^2} + \frac{1}{2}q_{B_2}^2 + \frac{var(\theta_B)s_e^2}{2(1+\gamma)^2} + \gamma\left[q_{B_1}q_{B_2} + \frac{var(\theta_B)s_e^2}{(1+\gamma)^2}\right]$

$\Rightarrow CS_B(\theta_B) = \frac{1}{2}\left(q_{B_1}^2 + q_{B_2}^2 + 2\gamma q_{B_1}q_{B_2}\right) + \frac{var(\theta_B)s_e^2}{(1+\gamma)}$ [4]

Therefore, $CS_B^e(t) = \frac{1}{2}\left[\left[q_{B_1}^e(t)\right]^2 + \left[q_{B_1}^e(t)\right]^2 + 2\gamma q_{B_1}^e(t) q_{B_2}^e(t)\right] + \frac{var(\theta_B)s_e^2}{(1+\gamma)}$ [5]

Appendix 2B

Country A

$q_{A_1}^e = \frac{1}{32}\left[16(1-c) + \frac{1}{C}\right]$

$\Pi_{A_1}^e = \left(q_{A_1}^e\right)^2$

$p_{A_1}^e = \frac{1}{2}\left(1 + c + \frac{3}{16c}\right)$

$CS_A^e = \frac{1}{2}\left(q_{A_1}^e\right)^2$

$TW_A^e = CS_A^e + \Pi_{A_1}^e + \Pi_{B_1}^e$

Country B

$q_{B_1}^e = \frac{\left[4(1-c)c+\bar{\theta}_B^2\right](3\gamma-4)}{12c(\gamma^2-4)}$; $\quad \Pi_{B_1}^e = \left(q_{B_1}^e\right)^2 - F$

$q_{B_2}^e = \frac{\left[4(1-c)c+\bar{\theta}_B^2\right](\gamma-3)}{6c(\gamma^2-4)}$; $\quad \Pi_{B_2}^e = \left(q_{B_2}^e\right)^2$

$p_{B_1}^e = \frac{4c[8-\gamma(3+\gamma)+c[4+\gamma(3-2\gamma)]]+\bar{\theta}_B^2[20-\gamma(3+4\gamma)]}{12c(4-\gamma^2)}$

$p_{B_2}^e = \frac{4c[2(3-\gamma)+c[6+\gamma(2-3\gamma)]]+\bar{\theta}_B^2[18-\gamma(2+3\gamma)]}{12c(4-\gamma^2)}$

$CS_B^e(t) = \frac{1}{2}\left[\left(q_{B_1}^e\right)^2 + \left(q_{B_2}^e\right)^2 + 2\gamma q_{B_1}^e q_{B_2}^e\right] + \frac{var(\theta_B)s_e^2}{(1+\gamma)}$

$TW_B^e = CS_B^e + \Pi_{B_2}^e + \frac{1}{12}\left[4(1-c) + \frac{\bar{\theta}_B^2}{c}\right] q_{B_1}^e$

Appendix 3A

Country B's consumers' surplus when firm 1 undertakes FDI in country B:

$CS_B^f(\theta_B) = (a+\theta_B s_{B_1})x_{B_1}(\theta_B) + (a+\theta_B s_{B_2})x_{B_2}(\theta_B) - \frac{x_{B_1}^2(\theta_B)+x_{B_2}^2(\theta_B)+2\gamma x_{B_1}(\theta_B)x_{B_2}(\theta_B)}{2} - P_{B_1}x_{B_1}(\theta_B) - P_{B_2}x_{B_2}(\theta_B)$ [1]

In equilibrium, due to symmetry, $s_f = s_{B_1}^f = s_{B_2}^f$, $p^f = p_{B_1}^f = p_{B2}^f$, $q^f = q_{B_1}^f = q_{B2}^f$ and $x_{B_1}(\theta_B) = x_{B_2}(\theta_B) = x_f(\theta_B)$.

Hence, $CS_B^f(\theta_B) = 2\left(a + \theta_B s_f\right) x_f(\theta_B) - x_f^2(\theta_B)\left(1+\gamma\right) - 2P_f x_f(\theta_B)$ [2]

Since $P_f = a + \theta_B s_f - x_f(\theta_B) - \gamma x_f(\theta_B) = a + \theta_B s_f - x_f(\theta_B)\left(1-\gamma\right)$, it holds that

$CS_B^f(\theta_B) = x_f^2(\theta_B)\left(1+\gamma\right)$ [3]

It also holds that:

(i) $x_{B_1}(\theta_B) = x_{B_2}(\theta_B) = x_f(\theta_B) = \frac{a(1-\gamma)+\theta_B(s_f-\gamma s_f)-P_f+\gamma P_f}{1-\gamma^2} = \frac{a(1-\gamma)+\theta_B s_f(1-\gamma)-P_f(1-\gamma)}{(1-\gamma)(1+\gamma)} = \frac{a+\theta_B s_f-P_f}{1+\gamma}$

(ii) $P_f = a + \bar{\theta}_B s_f - (1+\gamma)q_f \Rightarrow x_f(\theta_B) = \frac{a+\theta_B s_f-a-\bar{\theta}_B s_f+(1+\gamma)q_f}{1+\gamma} = \frac{\theta_B s_f-\bar{\theta}_B s_f}{1+\gamma} + \frac{(1+\gamma)q_f}{1+\gamma} = \frac{s_f\left(\theta_B-\bar{\theta}_B\right)}{1+\gamma} + q_f$

Then, using $x_f(\theta_B) = \frac{s_f\left(\theta_B-\bar{\theta}_B\right)}{1+\gamma} + q_f$, it holds that

$CS_B^f(\theta_B) = (1+\gamma)\left[\int_0^1 q_f^2 f(\theta_B)d\theta_B + \int_0^1 2q_f \frac{(\theta_B-\bar{\theta}_B)s_f}{(1+\gamma)} f(\theta_B)d\theta_B + \int_0^1 \frac{(\theta_B-\bar{\theta}_B)^2 s_f^2}{(1+\gamma)^2} f(\theta_B)d\theta_B\right]$ [4]

Given that $\int_0^1(\theta_B-\bar{\theta}_B)s_f f(\theta_B)d\theta_B = 0$; $\int_0^1(\theta_B-\bar{\theta}_B)^2 s_f^2 f(\theta_B)d\theta_B = var(\theta_B)s_f^2 \Rightarrow$
$CS_B^f(\theta_B) = (1+\gamma)q_f^2 + \frac{var(\theta_B)s_f^2}{1+\gamma}$ [5]
Therefore, $CS_B^f(\theta_B) = (1+\gamma)\left(q_{B_i}^f\right)^2 + \frac{var(\theta_B)s_f^2}{1+\gamma}$

Appendix 3B

Country A
$q_{A_1}^f = \frac{1}{32}\left[16(1-c) + \frac{1}{C}\right]; \quad \Pi_{A_1}^f = \left(q_{A_1}^f\right)^2$
$p_{A_1}^f = \frac{1}{2}\left(1 + c + \frac{3}{16c}\right)$
$CS_A^f = \frac{1}{2}\left(q_{A_1}^f\right)^2$
$TW_A^f = CS_A^f + \Pi_{A_1}^f + \Pi_{B_1}^f$

Country B
$q_{B_i}^f = \frac{4c(1-c)+\bar{\theta}_B^2}{4c(1+\gamma)}$
$\Pi_{B_i}^f = \left(q_{B_i}^f\right)^2 - D$
$p_{B_i}^f = \frac{4c[1+c(1+\gamma)]+(3+\gamma)\bar{\theta}_B^2}{4c(2+\gamma)}$
$CS_B^f = (1+\gamma)\left(q_{B_i}^f\right)^2 + \frac{var(\theta_B)s_f^2}{(1+\gamma)}$
$TW_B^f = CS_B^f + \Pi_{B_2}^f$

Appendix 4

Country A (Identical to Appendix 2B - Country A)
$q_{A_1}^w = \frac{1}{32}\left[16(1-c) + \frac{1}{C}\right]$
$\Pi_{A_1}^w = \left(q_{A_1}^e\right)^2$
$p_{A_1}^w = \frac{1}{2}\left(1 + c + \frac{3}{16c}\right)$
$CS_A^w = \frac{1}{2}\left(q_{A_1}^w\right)^2$
$TW_A^w = CS_A^w + \Pi_{A_1}^w + \Pi_{B_1}^w$

Country B
$q_{B_1}^w = \frac{\gamma\left[\bar{\theta}_B^2 - 4(c-1)c\right]}{4c(12-\gamma^2)}; \quad \Pi_{B_1}^w = \left(q_{B_1}^w\right)^2$
$q_{B_2}^w = \frac{(6-\gamma^2)\left[\bar{\theta}_B^2 - 4(c-1)c\right]}{4c(12-\gamma^2)}; \quad \Pi_{B_2}^w = \left(q_{B_2}^w\right)^2$
$p_{B_1}^w = \frac{4c\left[-12+\gamma\left[(1-c)\left(7-\gamma^2\right)+\gamma\right]\right]+(3+\gamma)[8+\gamma(\gamma-5)]\bar{\theta}_B^2}{4c(\gamma^2-12)}$

$p^w_{B_2} = \frac{2c\left[\gamma^2-6(1+c)\right]\left(\gamma^2-9\right)\bar{\theta}^2_B}{2c(\gamma^2-12)}$
$CS^w_B(t) = \frac{1}{2}\left[\left(q^w_{B_1}\right)^2 + \left(q^w_{B_2}\right)^2 + 2\gamma q^w_{B_1} q^w_{B_2}\right] + \frac{var(\theta_B)s^2_e}{(1+\gamma)}$
$TW^w_B = CS^w_B + \Pi^w_{B_2}$

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