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Abstract

This paper studies firms owners’ incentives to engage in Corporate Social Responsibility (CSR) activities in an oligopolistic market, in a strategic delegation and vertical product differentiation context. Firms’ owners have the opportunity to hire “socially responsible” managers and delegate to them CSR effort and market competition decisions. In equilibrium, both owners employ socially responsible managers. The strategic behavior of owners to hire socially responsible managers increases both output and profits. The societal consequences of Corporate Social Responsibility are also discussed.

**JEL classification:** L15; L22; M14.

**Keywords:** Oligopoly; Vertical Product Differentiation; Corporate Social Responsibility; Strategic Managerial Delegation.

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1 Introduction

This paper explores firms owners’ incentives to engage in Corporate Social Responsibility (CSR hereafter) activities in an oligopolistic market, in the context of strategic delegation of CSR effort and market decisions from owners to managers with quality differentials among products. The paper has been motivated by the ongoing discussion about the market and welfare implications of Corporate Social Responsibility or “A concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on voluntary basis” (European Commission, 2001). This discussion was initiated by the rapid growth of firms like ‘The Body Shop’, whose products are strongly connected to social and ecological considerations. This is a well documented case of a CSR oriented company (Klein, 1999).1

The aforementioned stylized facts reveal that private firms make considerable efforts to become, or at least to appear as, socially responsible.2 Given this evidence, the question that arises is the following: “Why would the owner(s) of a private firm be willing to engage in activities that promote social values?” The present paper addresses and formalizes this question in an oligopolistic market for a final good, where CSR effort and market decisions are delegated from owners to “socially responsible” (SR hereforth) managers, while consumers differ with respect to their valuation towards CSR activities.

The basic idea behind our model is that firms strategically engage in CSR activities in order to create a “socially friendly image” for their product. We consider that consumers are homogeneous regarding the physical character-

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1 Other well documented examples are corporations such as “Nike” and “Motorola”, which not only spend large amounts of money on CSR activities, but they also promote their socially responsible actions through frequent press releases. More specifically “Nike” puts emphasis upon the improvement of working conditions in its facilities in Asia and Mexico, especially after the reactions of many NGO’s on this issue. See the “Nike Corporate Responsibility Report”, at: www.nike.com/FY04_Nike_CR_report_pt1.pdf (Date last visited: January, 25th 2007). In a similar vein, “Motorola” attempts to create an environmental concerned image, by financing recycling programs. See the “Motorola Global Corporate Citizenship Report”, at: www.motorola.com/EHS/safety/reports/2000report.pdf (Date last visited: December, 15th 2006).

2 More than half of the top 100 corporations in the 16 more industrialized countries published a CSR report in the year 2005 (Becchetti et al., 2006).
istics, but heterogeneous towards the CSR aspects of each product. More socially responsible consumers have positive valuation for the product of the firm that engages in CSR activities, hence, they are willing to pay a higher price for the “socially friendly” good.\(^3\) This is the rational why some consumers show strong preference for “The Body Shop” products, even though these products are more expensive than other conventional cosmetics. On the other hand, engaging in CSR activities includes costly actions by the firm in order to operate in the interests of other stakeholders such as its employees (by improving working and safety conditions related to the production process), the broader community (by ordering more expensive inputs from local suppliers, by financing local cultural events and by contributing to charities) and the environment (by introducing “green” technologies or by financing recycling programs).\(^4\)

Our envisaged duopolistic market follows Häckner (2000) along with Garella and Petrakis (2005), using a utility function that combines horizontal and vertical differentiation of firms’ products. The vertical differentiation represents the CSR aspects of the production process that are perceived as quality improvement of the final product by socially conscious consumers. In this context, firms’ owners have two alternative strategies: either to delegate market competition decisions to an “SR” manager, or not. This reflects a common practice in the real business world, that is employing a manager with a strong background in CSR activities to undertake not only the CSR activities of the firm but also an active role in the overall decision making of the firm.\(^5\) The idea of firms’ owners employing managers that are concerned

\(^3\)Becchetti et al. (2005) quote the “2003 Corporate Social Responsibility Survey”. The main finding of this survey is that the amount of consumers that are socially concerned on their purchasing choices was 62% in 2001 in Europe.

\(^4\)See for example Mayer (1999) and Bris & Brisley (2006).

\(^5\)For instance, in large corporations such as “Vodafone” or “Hewlett-Packard”, the announcement of hiring a socially responsible manager is accompanied with detailed report on his/hers previous SR activities and active position in the overall decision making within the firm (Visit: http://www.vodafone.com/section_article/0,3035,CATEGORY_ID%253D30401%2526LANGUAGE_ID%253D0%2526CONTENT_ID%253D265256,00.html and http://www.hp.com/hpinfo/globalcitizenship/gcreport/intro.html (date last visited: December 12th 2006).
not only with strict profit-maximization, in order to achieve competitive advantage against their rivals, has been formalized in the theory of *strategic managerial delegation*. Following Miller and Pazgal (2001; 2002; 2005) we further consider that managers have a range of different stances towards CSR and this is captured by their “type”. Each manager tries to maximize his utility which is the sum of his firm’s profits plus the additional utility of engaging in CSR activities. Our main point is that each manager is committed to his own type, and by employing him, firm’s owners do commit to CSR of that type also. Therefore, delegation may be strategically used by a strict profit-maximizing owner so as to strengthen his firm’s competitive position in the market.

We examine two candidate equilibrium configurations. The first is *Universal CSR* in which both firms’ owners employ an SR manager (thus they engage in CSR activities) and the second is the *Asymmetric case* where only one owner hires an SR manager, while his rival hires a manager who does not undertake CSR activities. Our main finding is that in equilibrium, each firm’s owner employs an SR manager, because by doing so he has the opportunity increase his profits by obtaining competitive advantage. This interaction causes owners to strategically hire managers who undertake CSR activities.

Thus, Universal CSR is the only endogenously emerging equilibrium. Any unilateral deviation from the Universal CSR configuration would result the deviant firm to earn lower profits than these earned under its previous status. Hence, equilibrium output and profits under CSR activities are always higher compared to the benchmark case without CSR efforts. With respect to the societal effects of CSR activities, the strategic behavior of owners to hire SR managers increases consumers’ surplus and total welfare too.

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6. Vickers (1985), Fershtman and Judd (1987) and Sklivas (1987) investigate the effects of distorting managerial preferences away from strict profit-maximization towards including consideration of sales. More recently, Miller and Pazgal (2001; 2002; 2005) formalize the idea that in oligopolistic markets a firm’s owner may increase his firm’s profitability by hiring a manager who, besides his own firm’s profits is also concerned with the rival firms’ profits when he competes in the market.

7. Note that the results in our model do not change qualitatively when only CSR effort decisions are delegated to socially responsible managers, while market competition decisions are taken by owners. However as analyzed before, this is not the case in the real business world where socially responsible managers do have an active role in the overall
Our findings contribute to the existing literature on “strategic CSR”, a term that was introduced by Baron (2001) and refers to the case where firms are assumed to be socially responsible because they anticipate a benefit from such a behavior. Baron (2001, 2003) examines CSR under the prism of the strategic choice between public and private politics. His main finding is that private politics and CSR affect the strategic position of a firm in an industry under the existence of activist consumers, who can boycott firms with non socially behavior. In the same vein, Calveras et al. (2006), assuming a perfectly competitive supply of inputs, compare the effects of formal regulation to firms incentives to provide socially friendly goods as a respond to increased activism on behalf of consumers. They argue that substituting formal regulation with firms CSR actions may cause an inefficiency state, in which non activist consumers free-ride the willingness to pay of activist consumers, lowering formal regulation. McWilliams and Siegel (2001) model firms’ incentives to engage in CSR activities in oligopolistic markets with homogeneous goods. In the context of the Resource Based View of the firm, managers contact cost-benefit analyses to determine the level of firms’ resources that should be allocated to CSR activities. They argue that firms undertaking CSR activities will earn profits equal to those earned by their strictly profit-maximizing rivals.8 Bagnoli and Watts (2003) examine the case in which an oligopolistic firm links the provision of a public good (such as CSR activities) to the sale of their private product, in the context of unit demands and homogeneous socially responsible consumers. They find that the provision of CSR by firms is negatively related to the number of the firms in the market and positively related to the consumers’ willingness to pay for the supply of the public good.9 The present paper, focuses in the strategic interactions that arise between oligopolistic firms engaging in CSR activities by assuming heterogeneous consumers towards CSR and individual consumers can buy invariable quantities from both brands.

The rest of the paper is organized as follows: the next section introduces

8McWilliams and Siegel (2001) refer to this outcome as the “Neutrality Result”.
9See Viviani (2006) and McWilliams and Siegel (2006) for a survey on the subject.
the model. In section 3 we investigate owners’ incentives to hire an SR manager under Cournot competition, while in section 4 we discuss welfare effects. Section 5 offers the conclusion of this paper.

2 The Model

Consider a market that consists of two firms, denoted by $i, j = 1, 2, i \neq j$, each producing one brand of a differentiated product. Firm $i$ produces brand $i$ in quantity $q_i$. The population of consumers in this market is composed by individuals who have identical preferences regarding the physical characteristics of each brand. However, they are heterogeneous regarding the valuation of CSR activities that are undertaken by a certain firm. Thus, the utility function of the representative consumer is given by eq. (1):

$$U = (a+\theta s_i)q_i + (a+\theta s_j)q_j - (q_i^2 + q_j^2 - 2\gamma q_i q_j)/2 + m \quad \text{for } i, j = 1, 2, i \neq j$$

Parameter $\theta$ represents the type of consumer. More specifically, it represents the $\theta$ type of consumer’s willingness to pay, per unit of CSR effort produced by each firm. Hence, a more socially conscious consumer who has relatively high valuation for the product of the firm that engages in CSR activities will be of type $\theta \to 1$. On the contrary, a consumer who does not valuate the firms’ CSR activities too much during his purchasing decisions, is of type $\theta \to 0$. Furthermore it is assumed that $\theta$ is distributed according to a density function $f(\theta), \theta \in [0,1]$ with an expected value equal to $\bar{\theta}$, i.e. $\int_{0}^{1} f(\theta)d\theta$. Hence, $\bar{\theta}$ represents the average type of consumer in the population. $q_i$ represents the quantity of good bought by the representative consumer and $m$ is the respective quantity of the “composite good”. The parameters $s_i \geq 0$ and $s_j \geq 0$ represent the CSR efforts that firm $i$ and firm $j$ undertake, that, in turn, will increase consumers’ valuation for each individual firm’s product. In other words, $s_i$ represents the extra welfare that consumers have from good $i$ due to the CSR aspects of its production process. Hence, if firm $i$ engages in SR activities, it becomes apparent that
$s_i > 0$, while if it does not, $s_i = 0$.

The parameter $\gamma \in (0, 1)$ is a measure of substitutability among brands; if $\gamma \to 0$ brands are regarded as (almost) unrelated, whereas $\gamma \to 1$ corresponds to the case of (almost) homogeneous goods. $p_i$ and $p_j$ denote the unit prices for the respective goods, while the price of the composite good is normalized to be equal to unity. Note that, in our model each consumer buys both goods and invariable quantities. For the sake of simplicity we normalize the population of consumers to $N = 1$.

Maximization of utility with respect to $q_i$ and $q_j$ gives the (inverse) demand functions for the $\theta$ type of consumer.

$$P_{i\theta} = a + \theta s_{i\theta} - q_{i\theta} - \gamma q_{j\theta} - p_i + \gamma p_j$$ \hspace{1cm} (2)

By inverting eq. (2) we obtain the demand function for brand $i$ for the consumer of type $\theta$:

$$q_i = \frac{a(1-\gamma) + \theta(s_i - \gamma s_j) - p_i + \gamma p_j}{1 - \gamma^2}$$ \hspace{1cm} (3)

By integrating eq. (3) with respect to $\theta \in [0, 1]$ and inverting, we obtain the inverse aggregate demand functions for brands $i$ and $j$:

$$P_i = a + \bar{\theta}s_i - q_i - \gamma q_j \text{ for } i, j = 1, 2, i \neq j$$

Observe that the above demand functions are those of an average $\theta$-type consumer, $\bar{\theta}$.

We restrict our attention to firms with equally efficient initial production technologies, reflected in equal (constant) unit costs $c_i, i = 1, 2$ with $c_1 = c_2 = c < a$.

In this market, each firm has an owner and a manager. Following Fershtman and Judd (1987), when we say “owner”, we mean a decision maker whose objective is to maximize the profits of the firm. This could be the actual owner, a board of directors, or a chief executive officer. “Manager” refers to an agent that the owner hires to make real time operating decisions, and could maximize profits or act according to a personal objective function.
The owner of the firm seeks to maximize his profits given by eq. (4):

$$\Pi_i = (a + \bar{\theta}s_i - q_i - \gamma q_j)q_i - c(1 + s_i^2)q_i$$

(4)

Therefore, firm $i$’s total cost function is given by $C_i(.) = c(1 + s_i^2)q_i = cq_i + cs_i^2 q_i$. Note that this cost function reflects the idea that CSR effort changes the variable cost. The term $cs_i^2$ represents the additional unit cost of engaging in CSR activities, reflecting that in CSR includes costly activities by the firm such as: improved working conditions for employees, more expensive inputs from local suppliers, finance recycling and other SR campaigns, introduction of “green” technology and so forth. The concave form of this extra unit cost ensures decreasing returns to scale regarding the CSR activities. Hence, eq. (4) formalizes the idea that increased CSR activities by firm $i$ lead to higher consumers’ valuation for its product that, in turn, increases consumers’ demand for that. On the other hand, increased CSR activities by firm $i$ increase its unit cost of production too.

If the owner of firm $i$ decides to hire a CSR manager and delegate to him CSR and market competition decisions, manager $i$’s utility function takes the form:

$$M_i = \Pi_i + \tau_i s_i^2 q_i$$

(5)

Note that manager $i$’s objective function is derived by the sum of firm $i$’s profits plus what we call \textit{weighted additional utility of SR managers that engage in CSR activities}.\footnote{Following the terminology of Benabou & Tirole (2006) and Calveras et al. (2006) this additional utility has its source to intrinsic, and reputational incentives of individual agents.} This additional effort depends on the managerial type, $\tau$, suggesting that more socially concerned managers put higher effort on CSR activities. On the contrary, if a manager is not socially responsible, it becomes apparent from eq. (5) that he will be of type $\tau = 0$, implying that he behaves as a profit-maximizing agent.\footnote{In this case, it is explicitly assumed that firm does not undertake any CSR activities, i.e. $s_i = 0$.} \footnote{In order to guarantee interior solutions, the following sufficient condition must hold:}
We assume that owners offer to their managers “take it or leave it” incentive contracts.13 Moreover, managers are considered as risk-neutral agents. Based on Miller and Pazgal (2001; 2002; 2005), we argue that each firm’s owner chooses a manager whose attitude towards CSR fits to his (owner’s) competitive goals. Potential managers take on a continuum of attitudes towards CSR activities that are captured by their type and by hiring them, profit-maximizing owners are committed to a certain behavior towards CSR.

In order to examine which type of managers will firms’ owners select in equilibrium, we consider a three-staged game with the following timing: in the first stage, both firms’ owners, simultaneously and independently, decide over the type of manager that they will hire. Then, in the subsequent stage, given the manager that each owner has chosen is now hired and can not be reset; the managers of the firms undertake CSR efforts.14 In the third stage, the managers of the firms compete in quantities.

The above game is solved by employing the Subgame Perfect Nash Equilibrium (SPNE) solution concept. To investigate the conditions under which, a candidate equilibrium configuration of strategies, in the types of managers hired at the first stage, is proposed. Subsequently, it is checked whether or not it survives all possible deviations. If yes, the proposed equilibrium is a

\[ a - c > \frac{\gamma_s s_i (2c - \tau_i)}{2} \]

implying that the increase in the demand for the product of the firm that engages in CSR activities is not too high, comparing the relative market size.

13 Although in real life the terms of managerial contracts can be determined via owners-managers negotiations, it is a regular assumption in the strategic delegation literature that the market for managers is perfectly competitive and the owners have all the power during negotiations, i.e., they offer to their managers “take it or leave it” incentive contracts (see Vickers, 1985; Fershtman and Judd, 1987; and Sklivas, 1987). However in this model following Miller and Pazgal (2001; 2002; 2005), it is assumed that owners employ a certain type of manager (socially responsible or not) in order to commit to CSR of that type, seeking for competitive advantage against their rivals. Therefore it is considered that only a socially responsible manager \((\tau > 0)\) is not a subject of a perfectly competitive market for managers, therefore he receives an extra utility from CSR activities above his reservation wage.

14 This assumption is essential in order for delegation to have strategic value. Katz (1991) argues that unobservable contracts have no commitment value at all. Fershtman and Judd (1987) support that even if contracts are not observable, they will become common knowledge when the game is being repeated for several periods. More recently, Kockesen and Ok (2004) argue that to the extent that renegotiation is costly and/or limited, in a general class of economic settings, strategic aspects of delegation may play an important role in contract design, even if the contracts are completely unobservable.
Subgame Perfect Nash Equilibrium.

3 Equilibrium incentives for CSR under Cournot Competition

3.1 The symmetric case: Universal CSR

We begin our analysis assuming that both firms’ owners choose to delegate output decisions to SR managers. We may then ask whether this is a stable equilibrium configuration. If no owner has incentives to deviate towards pure profit-maximization (hence hire a manager of type $\tau = 0$), Universal CSR is a stable equilibrium. Equivalently, Universal CSR will endogenously emerge in the subgame perfect equilibrium.

Under the present candidate equilibrium configuration, in the first stage of the game, both owners simultaneously and non-cooperatively hire SR managers, i.e., managers characterized by $\tau > 0$. Then, CSR effort decisions are taken simultaneously by managers. In the last stage of the game both managers engage in output competition. Thus, manager $i$ sets $q_i$ so as to maximize his utility given by eq. (5), taking as given the type of his rival manager, $\tau_j$, along with the CSR effort, $s_j$, and the output level, $q_j$, that the latter sets.

The first order condition (foc) of eq. (5) provides manager $i$’s reaction function:

$$q_{CSR}^i(q_{CSR}^j) = \frac{a - c - \gamma q_j}{2} + \frac{2\bar{\theta} s_i - s_i^2 (2c - \tau_i)}{4}$$

(6)

Note that, by comparing eq. (6) to the benchmark case without CSR activities, CSR effort has two opposite effects on manager $i$’s decision over the level of output: on the one hand, CSR effort increases firm $i$’s level of production and thus, equilibrium output.15 On the other hand, CSR effort

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15 As a benchmark, the case where both owners employ non-socially concerned managers is considered ($\tau_i = \tau_j = 0$). This case corresponds to the original Cournot competition with $s_i = \tau_i = 0$, where the reaction function is given by: $q_i^C(q_j^C) = (a - c - \gamma q_j^C)/2$, while...
increases unit cost, decreasing equilibrium output. Thus, if \( s_i < 2\bar{\theta}/(2c - \tau_i) \), 
\( c > \tau_i/2 \) then the dominant effect is the first, while the opposite holds for 
\( s_i > 2\bar{\theta}/(2c - \tau_i) \).\(^{16}\)

By solving the system of the above focs we obtain the equilibrium output 
of the third stage:

\[
q_i^{CSR} = \frac{2a(2 - \gamma) - 2c[2(1 + s_i^2) - \gamma(1 + s_j^2)] + 2s_i(2\bar{\theta} + s_i\tau_i) - \gamma s_j(2\bar{\theta} + s_j\tau_j)}{2(4 - \gamma^2)}
\]  
(7)

In the second stage of the game, manager \( i \) sets \( s_i \) so as to maximize his 
utility given by:

\[
M_i^{CSR} = \frac{2a(2 - \gamma) - 2c[2(1 + s_i^2) - \gamma(1 + s_j^2)] + 2s_i(2\bar{\theta} + s_i\tau_i) - \gamma s_j(2\bar{\theta} + s_j\tau_j)}{4(4 - \gamma^2)^2}
\]  
(8)

Taking the first order conditions and solving the system of equations, we 
obtain the equilibrium CSR effort of the second stage:

\[
s_i^{CSR} = \frac{\bar{\theta}}{2c - \tau_i}
\]  
(9)

>From eq. (9) one observes that each SR manager will optimally set 
the amount of CSR effort that allows him to increase output, compared to 
the case where output level is choosen by profit-maximizing managers, that is 
\( s_i^{CSR} < 2\bar{\theta}/(2c - \tau_i) \). The intuition behind this result goes as follows: manager 
\( i \)'s objective function is consisted by firm \( i \)'s profits plus the additional utility 
of engaging in CSR actions. Hence, manager \( i \), by increasing CSR effort up to 
a level where output is also increased, firstly, his additional utility increases 
and secondly, he has the opportunity to gain competitive advantage for his 
firm and increase its profits.

In the first stage of the game, owner \( i \) chooses the type \( \tau_i^{CSR} \) of manager

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\(^{16}\)It must be noticed that in equilibrium, the inequality \( c > \tau_i^{CSR}/2 \) always holds.
that will hire in order to maximize his profits given by:\textsuperscript{17}

\[\Pi_i^{CSR}(\tau_i^{CSR}, \tau_j^{CSR})\]  

(10)

By imposing symmetry, solving the foc and rearranging we obtain a unique stable solution for the type of the manager that will be hired in equilibrium:

\[\tau^{CSR} = \tau_i^{CSR} = \tau_j^{CSR} = \frac{32c(a - c) + \bar{\theta}^2 (12 + 2\gamma - \gamma^2) - B}{a(a - c)(8 - \gamma^2)} > 0\]  

(11)

Where: \(B = \sqrt{\left[32c(a - c) + \bar{\theta}^2 (12 + 2\gamma - \gamma^2)\right]^2 - 16\gamma^2(8 - \gamma^2)(a - c)[4c(a - c) + \bar{\theta}^2]}\).

Observe from eq. (11) that, in equilibrium, since \(\tau^{CSR} > 0\), both firms’ owners do hire socially responsible managers. The intuition behind this result goes as follows: each owner, when choosing to hire an SR manager (who sets output at a level higher than that set under \(\tau = 0\), because this increases his utility), has an opportunity to obtain competitive advantage in the market, against the competing firm, provided that the rival owner does not hire an SR manager. In equilibrium, all owners act in the same way.

Plugging \(\tau^{CSR}\) in eq. (10), (9), (7) and (4) we obtain equilibrium values for CSR effort, output and profits: \(s^{CSR}\), \(q^{CSR}\) and \(\Pi^{CSR}\) respectively.

By comparing the equilibrium output and profits under universal CSR, with the corresponding under the benchmark case without CSR activities (original Cournot competition), we find that \(q^{CSR} > q_i^C\) always holds, since an SR manager will always set \(s_i^{CSR} < 2\bar{\theta}/(2c - \tau_i)\). Hence, in equilibrium, the manager will set output at a level higher than that set under a strict profit-maximizing behavior. Moreover, \(\Pi^{CSR} > \Pi_i^C\) always holds. Intuitively, firms’ profits are affected by two opposite effects: according to the first one, since CSR activities are evaluated by consumers positively, these activities increase demand and profits for the CSR related products. On the contrary, increased equilibrium output along with increased unit cost by both competing firms, tends to decrease equilibrium profits. Results in

\textsuperscript{17}Due to space limits some algebraic formulas are not presented. These are available from the authors upon request.
equilibrium reveal that it is the second effect that dominates. The following lemma summarizes:

**Lemma 1:** *Equilibrium output and profits under Universal CSR are always higher than output and profits in the benchmark case without CSR activities.*

Universal CSR is an equilibrium configuration only if no owner has incentives to unilaterally deviate by hiring a profit-maximizing manager. Suppose for instance that owner 1 decides to delegate output decisions to an SR manager, believing that owner 2 will do the same. Given that there is no credible commitment on the selection of managers, owner 2 decides to deviate towards hiring a manager of type \( \tau = 0 \). The deviation game unravels as follows:

In the first stage of the game owner 1 hires a manager of type \( \tau^{CSR}_1 \) that corresponds to the Universal CSR case. On the other hand, owner 2 will choose a manager of type \( \tau^d_2 = 0 \). Thus, plugging \( \tau^d_2 = 0 \) in eq. (10) we obtain the deviant’s profits: \( \Pi^d_2 \).

By comparing the deviation profits \( \Pi^d_2 \) with the profits in the Universal CSR configuration, \( \Pi^{CSR} \), we find that \( \Pi^{CSR} > \Pi^d_2 \) always holds. Therefore, firm 2’s owner does not have incentives to deviate from the Universal CSR towards a strict profit-maximizing behavior.\(^{18}\) The following proposition summarizes:

**Proposition 1:** *Universal CSR is an endogenously emerging equilibrium configuration.*

The intuition behind this result goes as follows: since each owner responds optimally to the choice of the competing firm’s owner, any deviation to a different managerial choice, such as strict profit-maximization, would result the deviant firm to earn less profits than its previous status, since under this scenario the competitor will obtain competitive advantage in the market. By doing so, each owner strategically uses the SR characteristics of

\(^{18}\)Of course, due to the symmetric market structure, the reverse configuration is (implicitly) proposed as a possible deviation.
his manager and obtains leadership in the market, accompanied by comparatively high profits. Note also that the case where both owners hire profit-maximizing managers is not an equilibrium, since the optimal response of an owner against a pure profit-maximizing manager $j$ is to hire a manager who is SR, i.e. he is more aggressive during the output competition stage of the game.

3.2 The Asymmetric case

We next propose as a candidate equilibrium configuration the Asymmetric one where owner $i$ chooses to hire an SR manager to compete in the market, while owner $j$ chooses a profit-maximizing one who will not undertake any CSR activities. This implies that the manager is of type $\tau_{pm}^j = 0$ and sets $s_{pm}^j = 0$. Under the present candidate equilibrium, in the last stage of the game, manager $i(j)$ chooses $q_i(q_j)$ in order to maximize his utility given by eq. (5). The corresponding reaction curves for manager $i$ and $j$ are given by:

$$q_i^{CSR}(q_j^{pm}) = \frac{a - c - \gamma q_j^{pm} + 2\bar{\theta}s_i^{csr} - s_i^{csr}(2c - \tau_i^{CSR})}{4}$$  \hspace{1cm} (12)

$$q_j^{pm}(q_i^{CSR}) = \frac{a - c - \gamma q_i^{CSR}}{2}$$  \hspace{1cm} (13)

Solving the system of the above foc, equilibrium output in the second stage is given by:

$$q_i^{CSR}(\tau_i^{CSR}, \tau_j^{pm} = 0, s_i^{CSR}, s_j^{pm} = 0) = \frac{(a - c)(2 - \gamma) + 2\bar{\theta}s_i^{csr} - s_i^{csr^2}(2c - \tau_i^{CSR})}{4 - \gamma^2}$$  \hspace{1cm} (14)

$$q_j^{pm}(\tau_i^{CSR}, 0, s_i^{csr}, 0) = \frac{2(a - c)(2 - \gamma) - 2\bar{\gamma}s_i^{csr} + \gamma s_i^{csr^2}(2c - \tau_i^{CSR})}{2(4 - \gamma^2)}$$  \hspace{1cm} (15)

In the second stage of the game, given that manager $j$ will undertake no CSR effort, manager $i$ sets $s_i^{CSR}$ by maximizing his utility given by:
\[ M_i(\tau_{CSR}^i, 0, s_{CSR}^i, 0) = \frac{[(a - c)(2 - \gamma) + 2\bar{\theta}s_{CSR}^i - s_{CSR}^2(2c - \tau_{CSR}^i)]^2}{(4 - \gamma^2)^2} \]  

(16)

Solving the foc of eq. (16), one obtains a unique solution of the CSR effort undertaken by manager \( i \):

\[ s_{CSR}^i = \frac{\bar{\theta}}{2c - \tau_i} \]  

(17)

We now restrict our attention to the first stage of the game. Given the decision of owner \( j \) to stick to profit-maximization, owner \( i \) chooses to hire a manager of type \( \tau_{CSR}^i \) so as to maximize profits given by \( \Pi_{CSR}^i(\tau_{CSR}^i, 0) \).

Solving the foc one obtains a unique solution for the type of the manager that owner \( i \) will hire in equilibrium:

\[ \tau_{CSR}^*_{i} = \frac{8c(a - c)(2 - \gamma) + \bar{\theta}^2(6 - \gamma^2) - \frac{1}{2}\Gamma}{(a - c)(2 - \gamma)(8 - \gamma^2)} > 0 \]  

(18)

Where: \( \gamma = \sqrt{\frac{8c(a - c)(2 - \gamma)}{4(8c(a - c)(2 - \gamma) + \bar{\theta}^2(6 - \gamma^2)) - 8c\gamma^2(a - c)(2 - \gamma)(8 - \gamma^2) - 8c(a - c)(2 - \gamma) + \bar{\theta}^2}} \)

Plugging \( \tau_{CSR}^*_{i} \) in eq. (17), (14), (15) and (4) we obtain firms’ equilibrium CSR effort output and profits denoted by: \( s_{CSR}^i, q_{CSR}^i, \Pi_{CSR}^i \) and \( \Pi_{PM}^i \), respectively.

By comparing the equilibrium output and profits under the Asymmetric case with the corresponding under the benchmark case without CSR activities, we find that \( q_{CSR}^i > q_{PM}^i, q_{CSR}^* > q_C^* \) and \( \Pi_{CSR}^i > \Pi_{PM}^i, \Pi_{CSR}^* > \Pi_C^* \) always hold. Thus, we state the following lemma:

**Lemma 2:** In the Asymmetric case, the firm that engages in CSR activities produces higher output and earns higher profits compared to its profit-maximizing competitor and the Benchmark case without CSR activities.

The intuition behind these results is that an SR manager will produce output at a level higher than that produced under strict profit-maximization. Thus, in the Asymmetric case, the owner that delegates market competition decisions to such a manager, obtains competitive advantage in the market.
In addition to that, positive CSR effort will increase the demand for his firm’s product. These two effects increase profits, compared to the rival firm and the benchmark case. Conversely, the strictly profit-maximizing manager produces output at a level lower than that produced by the SR manager, which affects negatively the profits of the former’s firm.

In order to examine if the asymmetric configuration is an equilibrium one, one has to check two possible deviations. Firstly, owner 2 may deviate from strict profit-maximization towards selecting an SR manager. Secondly, owner 1 may deviate and hire a profit-maximizing manager. If one owner is found to have incentives to deviate from his candidate equilibrium strategy, then the candidate equilibrium configuration is not a subgame perfect equilibrium. Therefore we will not have to check for any other possible deviation.

We begin our analysis with the first case of deviation. In the first stage, owner 1 hires an SR manager \((\tau_{CSR} > 0)\), believing that owner 2 will stick to profit-maximization. Owner 2 decides to deviate and also hire an SR manager of type \(\tau_{CSR} \neq 0\). Thus, plugging \(\tau_{CSR} \neq 0\) in eq. (10) we obtain the deviant’s profits: \(\Pi_{2}^d\).

By comparing the deviation profits \(\Pi_{2}^d\) with the profits that result in the candidate equilibrium (Asymmetric case), we find that \(\Pi_{j}^{pm} < \Pi_{2}^d\) always holds. Therefore, firm 2’s owner has always incentives to deviate from a strict profit-maximizing behavior towards hiring an SR manager. The following proposition summarizes:

**Proposition 2:** The Asymmetric case is not an endogenously emerging equilibrium configuration.

The intuition behind this result is along the lines of the equilibrium analysis given in Proposition 1 and thus, we omit it since it reproduces the arguments stated there.

## 4 Welfare analysis

In this part of the paper we investigate the societal effects of hiring SR managers, i.e. we undertake a welfare analysis. Total welfare is defined as:
with \( \Pi^A \) and

\[
U^A = (a + \theta s_i^A)q_i^A + (a + \theta s_j^A)q_j^A - (q_i^A q_j^A + q_j^A q_i^A - 2\gamma q_i^A q_j^A)/2
\]

being the overall market profits and consumers’ utility respectively.\(^{19}\)

Using the results in equilibrium from the previous sections, we obtain total welfare for the Universal CSR, \( TW^{CSR*} \), and the benchmark case, \( TW^{C*} \). By comparing total welfare under these configurations, we find that \( TW^{CSR*} > TW^{C*} \) always. The following Proposition summarizes:

**Proposition 3:** Firms owners’ strategic choice to engage in CSR activities increases welfare always.

Let us now proceed to explain how we came to this result. According to Propositions 1 and 2, it has already been clear that in equilibrium, each firm’s owner has a dominant strategy to hire an SR manager. This tends to increase output, profits, consumers’ surplus and total welfare. On the other hand, hiring SR managers increases unit cost of production, which decreases total welfare. It is found that the positive effect of increased consumers’ surplus on total welfare dominates the negative effect of increased costs and thus \( TW^{CSR*} > TW^{C*} \).

5 Concluding remarks

This paper explores firms owners’ incentives to engage in Corporate Social Responsibility activities in the context of an oligopoly, introducing strategic managerial delegation and vertical product differentiation. Owners are given the opportunity to hire a “socially responsible” manager and delegate to him market competition decisions. Each SR manager will try to maximize his utility given by the sum of firm’s profits plus the additional utility of SR managers that engage in CSR actions.

\(^{19}\)The Asymmetric case is not considered in this section, since it never emerges in equilibrium.
We find that in equilibrium both owners’ dominant strategy will be to employ an SR manager to compete in the market, because by doing so each owner has the opportunity to obtain competitive advantage against the rival firm. This interaction among competing firms causes equilibrium output and profits to be higher compared with the benchmark case where no CSR activities are undertaken. Our analysis also reveals that CSR activities increase social welfare.

The analysis was carried out for a duopolistic market structure. We are of the opinion that the duopolistic market reveals all essential implications considering the firms’ owners’ incentives to undertake CSR activities. We are also aware of the limitations of our analysis in assuming specific functional forms. However, it is the nature of the equilibrium conditions that drive our results that allows us to argue that these results will also hold under general demand and cost functions. The use of more general forms would jeopardize the clarity of our findings, without significantly changing their qualitative character. Given the current debate about the market and welfare implications of Corporate Social Responsibility the present paper sheds light on the firms’ incentives to engage in CSR activities in oligopolistic markets. We believe that our results could also provide guidelines for future empirical research on the “profitability of CSR schemes” literature and contribute to the so far inconclusive received empirical results (see McWilliams et al., 2006; Siegel and Vitaliano, 2006). A testable hypothesis that emerges from our analysis is that the higher the amounts that firms invest in CSR activities, the higher the mass of socially concerned consumers they attract and subsequently, the higher the firms’ profits.

References


