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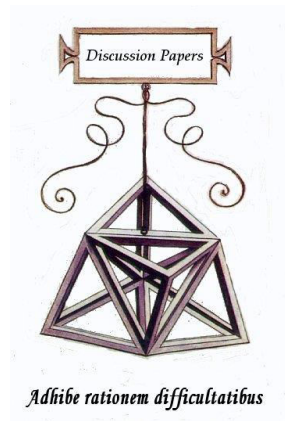
Discussion Papers

Adhibe rationem difficultatibus

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Profitability of corporate social responsibility in network industries

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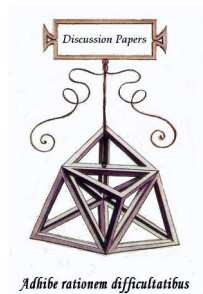
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Profitability of corporate social responsibility in network industries

Abstract

The present paper shows that, when firms compete in a non-cooperative way on the level of Corporate social responsibility (CSR) in network industries, the conventional result of the Prisoner's dilemma structure of the game in standard industries – i.e. to have social concerns is the Nash equilibrium but it is harmful for firms' profits – vanishes and, for sufficiently intense network externalities, the equilibrium in which both firms have social concerns is more profitable than simple profit-seeking. Moreover, we show that - when firms cooperate in choosing the profit-maximising level of social concerns - a profit-maximising CSR level does exist provided that network effects are sufficiently strong. Finally, a counter-intuitive result as regards consumers surplus and social welfare is obtained: those are always higher under competitive than cooperative choice of CSR because the level of CSR activities is higher in the former case. This also means that the non-cooperative choice of CSR not only achieves the largest profit but it is also Pareto-superior.

JEL codes: L13, M14.

Keywords: CSR, network effects, duopoly.

1. Introduction

Corporate social responsibility (CSR) is a growing feature in several industries. As some scholars have recently noted (e.g. Kopel and Brand, 2012; Fanti and Buccella, 2016 a,b; Becchetti et al. 2016) and the specialised documentation such as KPMG surveys (2005, 2011, 2013, 2016) reveals, an impressive as well as constantly increasing share of companies adopting CSR reporting: while in 2005, only to mention a few, 32% of US companies, 71% of UK companies and 90% of Japanese companies adopted CSR, in 2011 about 95% of the 250 world largest companies are reporting CSR activities and, finally, in 2013, 71 percent of 4,100 companies surveyed in 41 countries shows CSR activities. As other important examples, we can mention that 31% of the top 500 Fortune companies show detached CSR departments (ICCA, 2010) and more than 10% of total EU economy (in terms of GDP), with more than 11 millions of workers (6% of total employment) (as the EU Commission documented), take into account social objectives.

Moreover, the increasing creation of Socially Responsible Investment funds supporting CSR adoption encourages the growth of the share of CSR firms. In fact, as Becchetti et al. (2016, p. 50) report "socially responsible investment funds accounted for a share of around 11% of total assets under management in the United States in 2010 (Social Investment Forum Foundation, 2010) corresponding to 2.71 trillion dollars."

On the other hand, it has been acknowledged that network industries in recent years are a fast-growing phenomenon. In such industries, one consumer/client's utility derived from the use of the goods increases with the number of other consumers/clients of that goods, because positive network externality does exist: for instance, in the telephone and software sectors, the utility of a particular consumer from using a telephone or a software increases with the number of other telephone or software users.

   A remarkable fact is that, among the sectors which experienced an impressive development pace over the recent years in CSR activities, we find in a leading position network industries. For instance, according to a KPMG report, the technology, media & telecommunications sector presents a 79 percent of the companies surveyed reporting CSR activities, the highest levels among the

surveyed industries. In particular, the telecommunication subsector shows the highest rate of CSR reporting, with a 87 percent of the companies (KPMG, 2016a,b). In addition, the Reputation Institute global CSR survey shows that, among the world's top ten companies with the best CSR reputations, companies operating in network industries have a primary presence: Walt Disney ranks 2nd, Google 3rd, Microsoft 7th, Sony 9th and Apple 10th. Moreover, consumers perceive companies in network industries as the most socially responsible: for instance, Google ranks 1st, Microsoft 2nd, Walt Disney 3rd, Apple 7th and Intel 10th (Reputation Institute, 2016).

Therefore, it is natural to ask whether and how these two features - i.e. the presence of firms' social concerns and network externality – jointly affect, through their interplay, the standard outcomes of strategic oligopolistic contexts. In particular, while the network externality is an exogenous market feature, CSR activities may be a firm's choice variable and, thus, may be used strategically for enhancing its performance.

So far, a vast and increasing literature has separately analysed the effects of CSR behaviours and network externality. As regards the former, we note that CSR is a concept which may have several interpretations, in different fields of social reality: economics, politics, social integration and ethics. In the economics' approach – which is of course that pertinent to this work - corporation is an instrument[1] for wealth creation whose sole social responsibility is the maximization of shareholder value, as clearly stated by the Nobel prize Friedman (1970): "the only one responsibility of business towards society is the maximization of profits to the shareholders within the legal framework and the ethical custom of the country".

The maximization of shareholder value corresponds, in the standard industrial organization literature (e.g. Cournot competition), to a short-term profits orientation by firms. In such a context, for instance in the basic Cournot model, apparently there would be no room for CSR in an industry at equilibrium because it leads to produce too much output from the point of view of profit-

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[1] Garriga and Melè (2004) provide an interesting survey of the different interpretations of CSR.

seeking shareholders and, thus, it would be unprofitable (unless the CSR activities directly or indirectly positively affects economic costs of firms) [2]. However, CSR may play an important role if viewed from one firm as strategic variable to be used in oligopolistic markets. In fact, similarly to the managers' incentives towards sales analysed by the managerial delegation literature, CSR engagements may be seen by shareholders as a commitment device for their strategic choices in oligopolistic environments aiming at maximising their profits, by increasing its own market share.

Therefore, to address the problems relative to the firm's choice to become CSR-type the literature has followed various ways. On the one hand, a consistent part of the literature ascribes the firms' engagement in CSR activities to the fact that consumers value such activities (e.g. Manasakis et al., 2013, 2014 ; Graf and Wirl, 2014) or shareholders display social concerns (e.g. Baron, 2008) or other social agents push firms towards CSR activities (e.g. Baron and Diermeier, 2007). For instance Manasakis et al. (2013, 2014) and Graf and Wirl (2014) assume that consumers are willing to pay more for a CSR firm's products, while Baron (2008) assumes that firms may be CSR-type either because it is rewarded by consumers or because the shareholders and management value social activities (or both). Baron and Diermeier (2007) introduce political and social activists (often motivated by social or ethical concerns) as important components of the business environment who exert

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[2] In the standard literature - and also in the current work – the production costs of the firm are independent of the social concern level of the firm itself. If this does not apply, then whichever investment in social demands that would cut firm's costs would, at the same time, generate a shareholder value's increase, as Friedman (1970) analyses (cited in Garriga and Melè, 2004, p. 53): "It will be in the long run interest of a corporation that is a major employer in a small community to devote resources to providing amenities to that community or to improving its government. That makes it easier to attract desirable employees, it may reduce the wage bill or lessen losses from pilferage and sabotage or have other worthwhile effects." In addition, the literature has identified that CSR activities may conceivably improve the firms' profitability via different channels: for example, by reducing the rates of turnover and operating costs, enhancing efficiency, attracting more skilled, loyal and motivated employees (e.g. Nun and Tan, 2010). Nonetheless, without the above mentioned motives, the expected result is that CSR activities always reduce the firm's profit.

pressure on firms for social activities because the goal of activism is, typically, to influence firms and industry practices. Some authors such as Becchetti et al. (2016) assume that workers are the only corporate stakeholders and that there are CSR employment contracts which prevent the company from laying off workers also after a sequence of negative shocks affecting the capital accumulation.

On the other hand, other works assume that either the presence of CSR may be justified for its strategic role even if neither consumers nor shareholders particularly value social engagement (Goering, 2012; Brand and Grohe, 2013, 2015; Planer-Friedrich and Sahm, 2016) or may be exogenously given (e.g. Goering, 2007; Lambertini and Tampieri, 2010, 2012; Fanti and Buccella, 2016 a,b) or endogenously determined but only by one firm (Kopel and Brand, 2012).

Goering (2012) considers a bilateral monopoly in which either the manufacturer or the retailer can be socially concerned, and the firm's social concern is displayed by a share of consumers surplus included in addition to the firm's profit. That author finds that the optimal two-part tariff depends on a firms' objective function and that CSR reduces a firm's profit. Brand and Grohe (2013) extend the analysis to the case in which both firms are socially concerned, and get two further insights into the impact of firms' social concern on a perfectly coordinated marketing channel. Those authors show that the equilibrium outcomes are independent of the retailer's level of social concern, because of the assumption of the perfectly coordinated marketing channel. Brand and Grohe (2015), extending their preceding work, display that firm's social concern increases firm profit for the manufacturer as well as the retailer's profit, mainly because CSR behaviours soften the classical double marginalization problem. Planer-Friedrich and Sahm (2016) consider symmetric Cournot competition and show that the endogenous level of CSR is positive but such positive CSR levels imply, not unexpectedly, smaller equilibrium profits.

Goering (2007) develops a model of managerial delegation in which, as usual, managerial incentives are different from the firm's true objective and in only one firm this objective includes in addition to profits also a share of consumer surplus. He finds that managerial incentives, however, tends to decline as the fraction of

the consumer surplus in the output market is higher since the CSR-type firm moves closer to a social planner's objective function. Similarly, in Kopel and Brand (2012) only one firm in the considered duopoly can be socially responsible and firms can choose to hire managers. The key finding is that CSR may pay off, as long as it is not used too extensively. Making use of a Cournot duopoly model with heterogeneous products, Fanti and Buccella (2016b) analyse the firms' strategic decision of engaging in CSR activities. The authors adopt a game-theoretic approach to show that, depending on the degree of product differentiation and firms' level of social concern, a rich set of equilibria arises. In fact, either all firms in the industry follow CSR rules or are profit-maximising, or asymmetric and multiple symmetric equilibria are present in the industry. All those contributions find, as expected, that profits at the Nash equilibrium are damaged by CSR activities (also when the latter are endogenously determined).

As regards network industries, an increasing number of scholars has started studying how the presence of positive consumption externalities/network effects may alter the results of the standard models of imperfect competition. Following the simple mechanism of network effects pioneered by Katz and Shapiro (1985) - which is also assumed here, according to which the surplus that a firm's client obtains increases directly with the number of other clients of this firm – Hoernig (2012); Chirco and Scrimitore (2013); Battacharjee and Pal (2014); Fanti and Buccella (2016d) among others, analysed network models focusing mainly on the role of strategic managerial delegation or the role of bargaining agenda in unionised monopoly (e.g. Fanti and Buccella, 2016c).

None of the above mentioned literature has considered jointly the choice to make CSR activities and the presence of network externality. In this paper we develop a Cournot model in which firms may choose, cooperatively or non-cooperatively, the level of CSR interest, that is, in line with the branch of the literature above mentioned, the share of the consumer surplus to be taken into account in their objective function. A key question in the paper is whether CSR is good or bad for profits. As forewarned, the traditional result is that CSR may be in the interest of one firm to extend its own market share at the expense of the rival firm, but at equilibrium CSR results in a reduction of profits. Moreover, we

investigate how firms engage in CSR activities under the two choice regimes and how the level of CSR also influences output and welfare. A number of interesting and somewhat unexpected results are derived.

The key findings of the paper are as follows. Under the non-cooperative endogenous choice of the level of social engagement, the equilibrium of the game is that both firms select to follow CSR rules. However, in contrast to the common wisdom, the Nash equilibrium of being CSR-type is Pareto-superior in network industries: in fact, both firms are better off following CSR rules. On the other hand, in the case of cooperative choice of the level of CSR, the network effects have to be adequately intense to make CSR more profitable than profit seeking. As regards social welfare, the non-cooperative choice of CSR is always Pareto-superior, irrespective of the intensity of the network externalities: in fact, both shareholders and consumers yield the largest welfare.

The remainder of this paper is structured as follows. Section 2 introduces the model setup and analyses both the cases of the exogenous level and endogenous determination of the social engagement. The last section concludes outlining the future research agenda.

2 The model

We assume a duopoly in which firms produce homogeneous network goods. The inverse demand functions (see, e.g., Hoernig 2012; Chirco and Scrimitore, 2013; Battacharjee and Pal, 2014; Fanti and Buccella, 2016c) are as follows,

$$p = a - q_i - q_j + n(y_i + y_j), \qquad (1)$$

Where p is the price of goods *i*, q_i denotes the quantity of the goods produced by firm *i* (*i= 1, 2*), y_i denotes the consumers' expectation about firm *i*'s equilibrium market share, the parameter $n \in [0,1)$ indicates the strength of network effects (i.e. the higher the value of the parameter the stronger the network effects), and $a > 0$ is a demand parameter. The firm *i*'s profit function is given by:

$$\pi_i = (p_i - c)q_i, \qquad (2)$$

where c is the constant marginal cost. Marginal costs are assumed, for simplicity, to be zero.

Following the recent established literature, we incorporate consumer surplus into the firm's objective function (e.g. Goering 2007, 2008; Lambertini and Tampieri, 2010, 2012; Kopel and Brand, 2012 Kopel et al., 2014). This means that the firm wishes to maximize profits plus the consumer surplus that accrues to its stakeholders and may be parameterized through a simple combination of profits (Eq. 2) and consumer surplus, where the parameter $k_i \geq 0$ denotes the level of "social concern". Thus, the CSR objective function (W_i) is:

$$W_i = \pi_i + k_i CS = \big[a - q_i - q_j + n(y_i + y_j)\big]q_i + k_i\left[\frac{(q_i + q_j)^2 - n(y_i + y_j)^2}{2}\right]$$

$$(3)$$

In the second stage of the game (the market game), firms decide simultaneously on their output levels $q_i \geq 0$ to maximize their objective functions W_i. Given the CSR firm's objective function (3), from the first order conditions

$$\frac{\partial W_i}{\partial q_i} = \frac{\partial W_j}{\partial q_j} = 0 \qquad (4)$$

where i, j = 1, 2 and $i \neq j$, we obtain the reaction functions[3]

$$q_i(q_j, y_i, y_j, k_i, k_j) = \frac{a - q_j(1 - k_i) + n(y_i + y_j)}{2 - k_i}. \qquad (5)$$

As usual, then we impose the additional `rational expectations' conditions, that is $y_1 = q_1$ and $y_2 = q_2$. Hence, solving the system

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[3] By passing notice that the reaction functions are, as expected, negatively sloped, that is products are perceived by firms as strategic substitutes (i.e. network effects do not affect the inclination of the reaction functions).

composed by (5) and its counterpart for firm *j*, we obtain output and profit as a function of the CSR parameters:

$$q_i(k_i, k_j) = \frac{a(1 - k_i - k_j)}{3 - 2n - k_i - k_j} \qquad (6)$$

$$\pi_i(k_i, k_j) = \frac{a^2(1 - k_i - k_j)(1 + k_i - k_j)}{\left(3 - 2n - k_i - k_j\right)^2} \qquad (7)$$

Anticipating the market game equilibrium, firms may choose the level of CSR activities in a twofold way: 1) simultaneously and independently by each firm as strategic competitive variable to gain advantages over the rival firm (i.e. non-cooperative choice); 2) in a cooperative way to maximise joint profits (obviously only if a maximising level exists).

The traditional wisdom would predict that, in the first case, the game is a prisoner's dilemma and, at the endogenous equilibrium, firms choose to be CSR-type with the consequence of reducing profits with respect to the profit-seeking behaviour, while in the second case it is profitable to agree on no social activity.

2.1 Non-cooperative choice of CSR parameters.

In the first stage of the game, each firm *i* anticipates quantities (6) and chooses its CSR level $k_i \geq 0$ to maximize its corresponding profit given by (7). By solving the system composed by the first order conditions

$$\frac{\partial \pi_i}{\partial k_i} = \frac{\partial \pi_j}{\partial k_j} = 0 \qquad (8)$$

the following reaction functions in the CSR parameters space are obtained

$$k_i(k_j) = \frac{a(1 - 2k_j + k_j^2)}{3 - 2n - k_j} \qquad (9)$$

and at the equilibrium of the first stage the CSR level *k** that is chosen by each individual firm is given by

$$k_i = k_j = k^{NC} = \frac{5}{4} - \frac{n}{2} - \frac{\sqrt{17 - 20n + 4n^2}}{4} \, , \quad (10)$$

where *NC* denotes the case of non-cooperative choice of the CSR level. By substituting (10) backwards, we obtain output and profits at equilibrium

$$q_i = q_j = q^{NC} = \frac{2a}{\sqrt{17 - 20n + 4n^2} - 2n + 1} \quad (11)$$

$$\pi_i = \pi_j = \pi^{NC} = \frac{2a^2\left(\sqrt{17 - 20n + 4n^2} + 2n - 3\right)}{\left(\sqrt{17 - 20n + 4n^2} - 2n + 1\right)^2}. \quad (12)$$

Now we extend the above analysis by letting the firm endogenously choose whether to follow CSR rules. We show that the endogenous decisions of following CSR rules emerges as the SPNE outcome.

2.1.2 The mixed case: one firm follows CSR rule and the other one is profit-seeking.

Let us consider the case that the firm i maximises the social objective function (CSR) while the rival firm j maximises profits (*P*). Following the standard procedure, in the second stage, the firm i's profits as a function of its CSR parameter are given by

$$\pi_i(k_i) = \frac{a^2(1 - k_i)(1 + k_i)}{(3 - 2n - k_i)^2} \quad (13)$$

and at the first stage firm i chooses the following CSR level k_i^*

$$k_i^* = \frac{1}{3 - 2n} \quad (14)$$

Substituting backward (14), both firms' profits at the game equilibrium are given by

$$\pi_i^{NC,P} = \frac{a^2}{4(1-n)(2-n)^2} \qquad (15)$$

$$\pi_j^{NC,P} = \frac{a^2}{4(2-n)^2} \qquad (16)$$

Now we are in position to conduct the following analysis. We compare firm's profits under the two mixed cases and we investigate which rule (CSR or profit-seeking) *endogenously* emerges as SPNE for both firms.

Let us define the following profits differentials: $\Delta\pi_1 = \pi_i^{NC,P} - \pi^{P,P}$ and $\Delta\pi_2 = \pi_j^{NC,P} - \pi^{NC,NC}$. Hence, we state the following:

Result 1. *In the SPNE outcome of the game both firms choose to follow CSR rules. Proof: Result 1 straightforwardly derives from the signs of the two profit differentials involved in the determination of the SPNE:* $\Delta\pi_1 > 0, \quad \Delta\pi_2 < 0$.

Now, having established that both firms endogenously choose to be CSR-type, we investigate whether and how profits, as expected, are reduced by being CSR-type. First we report here the equilibrium outcomes under profit-seeking behaviours by firms (P): [4]

$$q^P = \frac{a}{(3-2n)} \qquad (17)$$

$$\pi^P = \frac{a^2}{(3-2n)^2} \qquad (18)$$

Then, the following results hold:

Result 2. *In contrast to the common wisdom, in network industries the Nash equilibrium of being CSR-type is Pareto-superior for $n \geq 0.74$: both firms are more profitable following CSR rules.*

Proof: Let us define the following profits differential:

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[4] These results are recently become standard in the literature on network industries and are drawn from Buccella and Fanti (2016) to whom we refer for more details.

$$\Delta\pi_3 = \pi_i^{CSR} - \pi^P = -\frac{a^2\left[\begin{array}{c}\sqrt{17-20n+4n^2}\,(4n^2-12n+9)+(2n-1)\sqrt{17-20n+4n^2}\\+8n^3-40n^2+66n-36\end{array}\right]}{\left(\sqrt{17-20n+4n^2}+1-2n\right)^2(3-2n)^2}$$

;

Result 2 *straightforwardly follows from* $\Delta\pi_3 \underset{<}{\overset{>}{=}} 0 \Leftrightarrow n \underset{<}{\overset{>}{=}} 0.74$.

2.2 Cooperative choice of a common CSR parameter.

In this case, firms cooperate for maximising joint profits through the choice of a uniform level of CSR activities, that is

$$\max_k (\pi_i + \pi_j) = \frac{2a^2(1-2k)}{(3-2(n+k))^2} \quad (19)$$

The following noteworthy result holds:

Result 3. *While in the absence of network effects or with weak effects to follow CSR behaviours is always profit-damaging, if the network effect is sufficiently intense, there is always a threshold value k^C below (above) which the higher k the higher (lower) profit is.*

Proof: This result is proved by observing that

$$\frac{\partial\pi}{\partial k} = \frac{a^2[2-4(n-k)]}{[3-2(n-k)]^3} \quad (20)$$

and

$$\frac{\partial\pi}{\partial k} \geq 0 \Leftrightarrow k \leq k^C = n - \frac{1}{2}. \quad (21)$$

Corollary. *Provided that n>0.50, an optimal positive value of k^C always does exist and this optimal value is increasing with n: the larger is the network externality, the higher is the optimal level of the sensitivity to consumer surplus by firms.*

Therefore, we have two regimes: 1) $n < 0.5$, where firms decide cooperatively not to engage in CSR activities, and thus, by definition, the equilibrium outcomes are the same of those of profit-seeking firms; 2) $n \geq 0.5$, which we denote as the cooperative regime (C). In the latter regime the equilibrium outcomes are the following:

$$q_i = q_j = q^C = \frac{a}{4(1-n)}$$

(22)

$$\pi_i = \pi_j = \pi^C = \frac{a^2}{8(1-n)} \qquad (23)$$

Now we are in a position to compare the equilibrium outcomes under the three different regimes: profit-seeking, non-cooperative CSR and cooperative CSR.

Lemma 1. The engagement in CSR activities is the largest in the case of unilateral engagement, and is higher under non-cooperative than under cooperative choice of such activities. Proof: by simple inspection of (10), (14) and (21), the following ranking holds: $k_i > k^{NC} > k^C$.

Result 4. Profits under cooperative CSR are always larger than those under non-cooperative CSR.

Proof:

$$\Delta\pi_4 = \pi^{NC} - \pi^C = \frac{a^2 \left[(6n-7)\sqrt{17-20n+4n^2} + 20n^2 - 52n + 33 \right]}{4(1-n)\left(\sqrt{17-20n+4n^2} + 1 - 2n \right)^2} < 0, \quad \forall n \in [0,1)$$

Result 5. Profits of cooperative CSR firms are always larger than those under profit-seeking.

Proof: $\Delta\pi_5 = \pi^C - \pi^{PM} = \dfrac{a^2(1-2n)^2}{8(1-n)(3-2n)^2} > 0 \quad \forall n \in [0.5,1)$

Finally, some considerations on welfare effects of the different regimes. Let us report the following expressions of standard consumer surplus (CS) and social welfare (SW):

$$CS^{NC} = \frac{8a^2(1-n)}{\left(\sqrt{17-20n+4n^2}-2n+1\right)^2}$$
(24)

$$CS^C = \frac{a^2}{8(1-n)}$$
(25)

$$CS^P = \frac{2a^2(1-n)}{(3-2n)^2}$$
(26)

$$SW^{NC} = \frac{4a^2\left(\sqrt{17-20n+4n^2}-1\right)}{\left(\sqrt{17-20n+4n^2}-2n+1\right)^2}$$
(27)

$$SW^C = \frac{3a^2}{8(1-n)}$$
(28)

$$SW^P = \frac{2a^2(2-n)}{(3-2n)^2}$$
(29)

Result 6. *CS and SW are always higher under non-cooperative CSR; furthermore, under profit-seeking behaviour they are higher than under cooperative CSR (for $n \geq .5$).*

Proof: by inspection of (24)-(29) it is straightforward to establish the following ranking:

1) *for $n < .5$, $CS^{NC}(SW^{NC}) > CS^P(SW^P) > CS^C(SW^C)$*

2) *for $n \geq .5$, $CS^{NC}(SW^{NC}) > CS^C(SW^C) > CS^P(SW^P)$*

Therefore, no matter the intensity of the network externalities, the non-cooperative choice of CSR is Pareto-superior because both shareholders and consumers yield the largest welfare. The policy

implications are direct: 1) the adoption of CSR rules in network industries should be mandatory or at least incentivized; 2) however, if network externalities are sufficiently intense, the antitrust authorities have to watch over not only tacit collusive agreements to reduce directly production, but also indirect collusion to reduce output via a common "social responsibility" within those sectors.

3. Conclusions

In a Cournot duopoly, the present work has shown that, when firms compete non-cooperatively on the CSR level in network industries, the conventional result of standard industries that the game has a Prisoner's dilemma structure – that is, to be socially engaged is the Nash equilibrium, however this reduces the firms' profitability – vanishes and, for a large range of the network externalities, the equilibrium in which both firms have social concerns is more profitable than simple profit-seeking. Moreover, it is shown that - when firms cooperatively select the profit-maximising level of social concerns – there is a profit-maximising level of CSR activities, provided that the network effects are sufficiently strong. Finally, it is obtained a counter-intuitive finding with regard to consumers surplus and overall social welfare: those are always higher under competitive than cooperative choice of CSR because the CSR level is higher in the former case. This implies that the non-cooperative choice of CSR not only achieves the highest profit but it is also Pareto-superior. As a consequence, a government which objective is to improve the overall welfare should consider the following policy implications: 1) CSR activities in network industries should be compulsory or at least incentivized; 2) nonetheless, if network externalities are adequately intense, the antitrust authorities have to watch over both tacit collusive agreements to cut directly production and indirect collusion to reduce output via the decision of adopting a common CSR rule within those sectors. As future line of research, those results call for a robustness check under different model specifications such as price competition, the presence of managerial delegation, different production technology and endogenous costs (such as unionised labour costs).

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