

Heterogeneous Producers' Cooperatives and Corporate Social Responsibility

Luisa Giallonardo - Marcella Mulino

UNIVERSITY OF L'AQUILA

Abstract

Cooperation and CSR have various facets in common since CSR represents an integral part of cooperatives' values. Indeed, cooperatives have a long tradition in combining economic viability with social responsibility, as their organization generates a more immediate relationship between shareholders and stakeholders thus making it easier to achieve the necessary balance between their diverse interests.

In the paper we set out a model that considers producer cooperatives engaged in strategic CSR. Our focus is on the role of consumers' demand for CSR products, according to the so called "bottom-up pressure", that is consumers' initiative in appreciating CSR. We enrich the above approach with the idea that the adoption of socially and environmentally responsible practices in production is a specific feature of goods improving their "quality" and represents a novel type of product differentiation. Hence, our model builds on the strand of literature about heterogeneous firms in monopolistic competition, developed by the recent "new-new" trade theory, that incorporates quality product differentiation.

In a closed economy with CSR option in production, we derive each producer cooperative's optimal choices with reference both to prices and the level of ethical standards. Albeit cooperatives differ with respect to the productivity of their members/workers, the solutions to both optimization problems are the same for all cooperatives, pointing to heterogeneity in the net income per member. In addition, our analysis confirms the role of consumers' "bottom-up pressure", since cooperatives' optimal level of ethical standards is positively linked to the intensity of the preference of "concerned" consumers for CSR goods.

JEL codes: P130, L130, M140.

Keywords: Producers' cooperatives, Corporate Social Responsibility, Vertical product differentiation, Heterogeneous firms.

1. Introduction

In recent years Corporate Social Responsibility (CSR) has been the object of an increasing attention from scholars in different scientific fields; in economics, it poses several challenges dealing with the potential conflict between the working of a capitalist market entailing “selfish” behavior and CSR requirements that lead to sacrifice at least a part of firms’ profits. Yet, CSR is not a challenge for all economic organizations since it represents an integral part of cooperatives’ values in view of the fact that cooperation and CSR have various common elements.

With reference to entrepreneurial firms, the above mentioned conflict is dealt with by Friedman (1977), which underlines that managers are elected by shareholders in order to reach positive results in terms of profits. As CSR has a cost, managers would not be allowed to pay for purposes leading to lower profits. In fact, managers would not pursue morally valuable social causes without considering the reactions of markets and consumers to their behavior. In such a context, integrating social and environmental dimensions into business choices is not realistic, as it entails actions involving a decrease in profits. According to Friedman view, CSR is not justified on economic grounds when it is not directed to the main objective of the firm: profit maximization.

Following the above statement, a recent strand of literature, the so called “strategic CSR”¹, considers CSR to be a way to let production become more profitable. According to this strand of literature, “responsibility as social purpose consists of the research of profit and CSR activities are a consequence of incentives coming from the markets (goods, work, capital), where the firm is located” (Sacco-Viviani, 2005). The idea is that firms choose CSR because the benefits accruing to a CSR firm are able to offset the extra costs it has to face. Thus, ethical behaviour does not necessarily imply an unselfish action; on the contrary, it links entrepreneurs’ interest with those of their clients, suppliers, and other stakeholders at large. CSR benefits (Becchetti *et al*, 2010) may refer to enhanced workers' productivity due to the stimulus of intrinsic motivations associated to the reduced gap between workers' ideals and corporate goals.² Otherwise, they may be linked to the impulse toward innovation activities (i.e. in developing more efficient energy saving processes), thereby creating a technological leadership. Alternatively, CSR may be a signal of product quality in a framework of asymmetric information, given that one of the main stakeholder categories to which CSR refers is that of consumers. Hence, a firm engaged in CSR activities may meet the demand of

¹ To the best of our knowledge, Baron (2001) and McWilliams and Siegel (2001) were the first two papers to explicitly model “profit-maximizing” CSR. Baron (2001) coined the phrase “strategic CSR.”

² A recent empirical test on this subject has been performed by Edmans (2009) for US companies.

“concerned” consumers who are willing to pay for the CSR intangible values incorporated in the products and services sold by the firm.³

As to cooperative firms, they are companies that, owing to their nature, fit the model of CSR very well, because of the values and principles characterizing the way in which they work. Cooperation and CSR have various common elements, as appears from the definition from the International Cooperative Alliance, that states that “cooperative partners participate in ethical values of honesty, transparency, responsibility and social vocation.” Moreover, it has been stressed (Carrasco, 2007) that three out of seven cooperative principles refer explicitly to matters relating to CSR, i.e., those referring to education and information, to cooperation between cooperatives, and to the sustainable development of the community. The European Commission, as well, underlines that “Co-operatives, mutuals and associations as membership-led organisations have a long tradition in combining economic viability with social responsibility. They ensure this through stakeholder dialogue and participative management and thus can provide an important reference to other organisations.” (European Commission, 2002, p. 10).

With reference to the latter aspect, i.e., to CSR as a device to meet shareholders’ as well as stakeholders’ expectations, the cooperative organization makes the relationship between the two groups more immediate. In fact, the double, or sometimes triple status of members of the cooperative as suppliers of intermediates, or labour and financing resources, and/or as clients makes it is easier to achieve the necessary balance between their otherwise conflicting interests.

On the whole, the cooperative culture can generate trust as a result of its socially responsible nature, and this is a characteristic which is increasingly appreciated by consumers when deciding to purchase.

In the paper we build a model that considers cooperative firms that engage in explicit CSR activities, according to the idea of “strategic CSR”, where social responsibility is seen as part of an economically rational decision. In particular, the focus is on the role of consumers’ demand for CSR products,⁴ according to the so called “bottom-up pressure”, that is, to taste-based preferences of “concerned” consumers willing to purchase products from cooperatives with high ethical standards.

In such a context, we deviate from the existing analyses in several distinct and important ways. First, we consider social responsibility to be a specific feature of the productive process improving the “quality” of cooperatives’ products. In this way, we

³ For empirical tests on the willingness to pay for intangible social and environmental values of products revealed in consumer purchases see Becchetti *et al.* (2006), Fisman *et al.* (2006), Becchetti-Rosati (2007).

⁴ As explained in the next section, we define CSR products as the goods produced by cooperatives pursuing ethical standards in production.

are able to consider CSR as a form of product differentiation based on the adoption of socially and environmentally responsible practices in production. Second, following from the aforesaid product differentiation approach, our model analyses the behavior of producer cooperatives (hereafter, PCs) operating in a monopolistic competition setting. Third, we follow a CSR-based product differentiation methodology in a context of heterogeneous PCs, with two levels of differentiation among PCs, with reference both to productivity and CSR intensity. The reference is to the recent “new-new” trade theory (Mélitz, 2003) of monopolistic competition that incorporates quality product differentiation; however, in addition to drawing a parallel between product quality and CSR intensity, our model assumes a closed economy and considers the behavior of cooperative, instead of entrepreneurial, firms so that the optimal intensity of CSR is endogenously determined by net-revenue-maximizing cooperatives.⁵

The paper is organized as follows. The next section deals with the parallel we draw between the CSR feature and the quality embodied in products. In section three we depict the demand side of the model, where we assume vertical differentiation in consumers’ preferences. In the following section we illustrate the supply side of the monopolistic competition model with heterogeneous PCs operating in no-SR or in SR industries; on such a basis, we endogenously derive the optimal level of CSR content resulting from a net per worker revenue maximization problem. Section five draws some conclusions.

2. CSR, product quality and cooperative firms

The literature dealing with CSR puts forward a crucial distinction between horizontal and vertical differentiation criteria, on the basis of consumers’ preference for CSR. In the first case consumers don’t necessarily prefer to have a higher share of CSR than a lower one, since they define *a priori* their optimal quantity of CSR. On the contrary in the second case a higher quantity of CSR entails a higher utility for all consumers.

Theorists of the horizontal differentiation approach assume that consumers regard the price firms pursuing ethical standards would require as excessive, when ethical standards followed by the firm are higher than theirs. Such consumers judge that public institutions are to be taken responsible for enforcing and safeguarding ethical values, as they believe that firms do not have either the competence or the capability to engage in socially responsible initiatives. If this is the case, firms’ CSR activities would not have a

⁵ For open economy models with profit maximizing firms, see Antoniadis (2008), Johnson (2008), Heble-Okubo (2008), Hallak-Sivadastan (2009).

relevant impact on the sustainability objectives of the whole community. The result is a poor demand for products with ethical contents.

In contrast, supporters of the approach of preferences' vertical differentiation believe that consumers value the CSR content of goods; besides preferring – for a given price – a product with higher CSR characteristics with respect to a lower CSR good, they are willing to pay a higher price for a higher ethical content, according to their preferences. This view is confirmed by empirical analyses that find evidence of a widespread consumers' preference for firms' ethical effort (Becchetti *et al.*, 2006, Becchetti-Rosati, 2007).

An intermediate position accepts the vertical differentiation approach as described above, admitting however the existence of heterogeneous consumers; for instance, Becchetti-Giallonardo-Tessitore (2007) consider that consumers are distributed along an ethical segment of differentiation, whereas Besley-Ghatak (2007) assume consumers to be divided into two groups, where only the group of socially responsible consumers appreciates the CSR content of goods.

We follow the latter “polar” approach, since in our model we assume the simultaneous presence of two types of consumers: one group of socially responsible consumers appreciating the CSR intangible values incorporated in products, and another group of consumers not deriving additional utility from consuming goods with a SR content. Differently from Besley-Ghatak (2007), however, in our analysis we link the “preference” for CSR of socially responsible consumers to consumers' income, on the assumption that CSR can be considered a luxury characteristic of the goods, that is valued to a greater extent by richer consumers.

In addition, our model merge the vertical differentiation approach to CSR, referring to the vertical differentiation of consumers' preferences, with the concept of quality product differentiation in production (also defined as vertical product differentiation, according to Grossman-Helpman, 1991). In fact, we believe that considering CSR as a characteristic that increases the value of the good consumed is analogous to considering it as a “quality” attribute of the product. Indeed, CSR and “quality” present several similarities. “Quality” is related to “several product characteristics, such as product performance, durability, reliability, and consistency with specifications”.⁶ In Schumpeterian growth models it represents the result of a rational choice of firms which invest resources in research and development, obtain stochastically an increase in the qualitative characteristics of the product and thus conquer market shares, given consumers' demand. The latter derives from consumers' preferences that positively

⁶ See Barin Cruz-Boeche (2010).

value the quality embodied in the products; accordingly, consumers' demand depends not on pure relative prices, but on quality-weighted relative prices.

In turn, CSR includes a number of actions with social characteristics that a firm can undertake, some of which are performed in the production process, so that CSR is embodied in products' attributes. In our analysis we specifically refer to ethical efforts in the productive process leading to goods encompassing CSR features. Actually, McWilliams *et al.* (2005) recognize that a socially responsible firm will produce "incorporating social characteristics or features into products", whereas Fisman *et al.* (2006) indicate that firms use CSR activities to signal their product quality, especially those that operate in highly competitive market, thus differentiating their product and gaining market power.⁷

Therefore, in our view products of socially responsible firms, and thus also of socially responsible PCs, include specific attributes that can be regarded as features improving the "quality" of goods in the consumers' eyes. As long as the ethical features of the goods enter into consumers' utility function so that households are willing to pay for it, PCs may find it profitable to invest resources in order to produce goods that incorporate social characteristics; in this way, socially responsible cooperatives are able to manufacture goods embodying CSR ("quality") elements that increase the products' value. In fact, today many consumers are concerned about how goods and services have been produced: they demand not only quality in products or services but also demand certainty that the productive process is organized following some ethical standards.

Following this perspective, CSR may be considered as a novel type of product differentiation.⁸ For instance, CSR cooperatives may be certified 'fair labor' companies, may employ inputs purchased on a fair trade basis, or may use environmentally responsible technologies. In so doing, they differentiate their products from the ones of traditional PCs. As a result, CSR plays a role similar to the one performed by quality differentiation: it creates a competitive advantage for the cooperative.

Building on the strand of literature on quality product differentiation by heterogeneous firms in monopolistic competition, developed by the recent "new-new" trade theory, our analysis differs from previous contributions on labour-managed (LM) firms' quality choice. More than two decade ago, Martin (1986) developed the first quality-choice model for a LM firm - making as well a comparison between the monopolistic LM firm and its profit-maximizing twin - on the assumptions that there is no demand for quality

⁷ For some evidence supporting the product-signaling hypothesis see Harjoto-Jo (2011) who find that firms in more competitive markets are more likely to engage in CSR activities.

⁸ See McWilliams *et al.* (2005) and Barin Cruz- Boeche (2010).

per se, which implies “that the consumer’s demand is for product service ... rather than for the quantity of product ...”⁹ and that the service flow from the product is proportional to the stock on hand. The latter assumption implies that quantity and quality are perfect substitutes in the production of product service. In our model, instead, consumers’ “bottom-up pressure” is a crucial element at the basis of “strategic CSR”; in addition, we assume a non-linear intensity of the consumers’ desire for the CSR content of goods. A more recent analysis is in Horowitz-Horowitz (1999), where it is shown that the LM firm’s behavior regarding quality and quantity depends on which workers own and manage the firm: the distinction is made between cooperatives owned by production workers (traditional PCs), cooperatives owned by information-related quality-enhancing workers, or some combination of the two. The comparison between the LM firm and its profit-maximizing twin in the monopolistically competitive market deliver different outcomes according to the type of cooperative which is considered. In our model we limit the analysis to PCs, and do not perform a comparison with a twin entrepreneurial firm.

3. Consumers’ demand for CSR goods

We consider a closed economy model where households have a preference for diversity and therefore derive utility from the consumption of all available differentiated varieties of products, which substitute imperfectly for each other.

We assume the vertical differentiation of consumers’ preferences with respect to CSR: in the economy there are two types of consumers, differentiated according to their appreciation of the ethical content of goods. The first group consists of socially responsible consumers (whom we refer to as *caring*) valuing the quality of goods, in terms of SR, whereas in the other group are households not deriving additional utility from consuming goods with a SR content (whom we refer to as *neutral*).¹⁰ We assume the composition of population in the two groups to be fixed through time.

In the economy there are Z differentiated no-SR products, indexed by z , with $z=1, \dots, m, \dots, Z$. Preferences among the varieties of no-SR products of a representative type- n (*neutral*) consumer are described by the following constant elasticity of substitution (CES) utility function:

⁹ Martin (1986), p. 402.

¹⁰ The above denominations for the two types of consumers are drawn from Besley-Ghatak (2007).

$$U^n = Z^{\frac{1}{\theta}} \left[\sum_z (C_z^n)^{\frac{\theta-1}{\theta}} \right]^{\frac{\theta}{\theta-1}} \quad (1)$$

where C_z^n is the quantity consumed of variety z of the bundle of no-SR goods, measured in physical units, and $\theta > 1$ is the elasticity of substitution between varieties. Equation (1) states that all no-SR goods enter the utility function symmetrically.

In the economy there are also J differentiated SR products, indexed by j , with $j=1, \dots, h, \dots, J$. Differently from the previous case, an additional product-specific CSR parameter enters in the CES utility function describing preferences of a representative type- c (*caring*) consumer:

$$U^c = \left[\sum_j (s_j^\lambda C_j^c)^{\frac{\theta-1}{\theta}} \right]^{\frac{\theta}{\theta-1}} \quad (2)$$

where s_j is the CSR content, assumed to be observable to all, of variety j of the bundle of SR goods, measured in utility per physical unit, with $s_j > 1$, and C_j^c is the quantity consumed of variety j . The J differentiated SR products enter in each consumer's preferences in relation to their quality content. The parameter $\lambda > 0$ captures the intensity of the consumers' desire for the CSR content of goods.¹¹ The CSR content of each product j is a demand shifter: higher CSR goods yield higher consumption utility per unit consumed. For the sake of simplicity, we assume the elasticity of substitution between varieties to be the same for all types of consumers.

Each consumer earns her income as a member of a PC; she supplies her labour endowment once the income deriving from the PC's membership is at least greater than her "reservation wage". The latter is defined as the minimum income necessary for the individual to optimally choose to work, thus giving up leisure; we assume the "reservation wage" to be the same for all households, both "neutral" and "caring". We also suppose that each worker receives an equal share of the PC surplus.

The "neutral" representative consumer obtains her demand function for a particular variety κ ($\kappa = z, j$) of products following an utility maximization process; we obtain the aggregate demand for each variety by adding all consumers' demands for the same variety. Thus, we get the following demand function for a particular variety z by the type- n representative consumer:

$$C_z^n = \frac{1}{Z} \left(\frac{p_z}{P_z} \right)^{-\theta} \frac{R_n}{P_z} \quad (3)$$

¹¹ Following Hallak (2010), λ may be assumed to be positively linked to the consumer's real income.

where R_n is the consumer's income deriving from her membership in a PC engaged in producing a differentiated variety z ,¹² p_z is the price of such variety and P_z is the aggregate price index of no-SR goods, defined as¹³:

$$P_z = \left[Z^{\theta-1} \sum_z (p_z)^{(1-\theta)} \right]^{\frac{1}{1-\theta}} \quad (4)$$

Correspondingly, utility maximization by the representative type- c consumer leads to the following demand function for a particular variety j :

$$C_j^c = \left(\frac{P_j}{P_j} \right)^{-\theta} s_j^{\lambda(\theta-1)} \frac{R_c}{P_j} \quad (5)$$

where p_j is the price of variety j and P_j is the aggregate quality-adjusted price index of SR goods, defined as:

$$P_j = \left[\sum_j (p_j / s_j^\lambda)^{(1-\theta)} \right]^{\frac{1}{1-\theta}} \quad (6)$$

From equation (5) it appears that the J differentiated SR products

Summing individual demands for variety z - equation (3) – over all “neutral” consumers we obtain the aggregate demand for variety z as a function of relative prices, with elasticity θ , and all consumers' real income, with unitary elasticity:

$$C_{n,z} = \frac{1}{Z} \left(\frac{p_z}{P_z} \right)^{-\theta} \frac{R_n}{P_z} \quad (7)$$

On the other hand, the solution of the “caring” consumers' maximization problem leads to an aggregate demand for variety j - by summing equation (5) over all “caring” consumers - as a function of the intensity of the consumers' desire for the CSR content of goods, as well:

$$C_{c,j} = \left(\frac{p_j}{P_j} \right)^{-\theta} s_j^{\lambda(\theta-1)} \frac{R_c}{P_j}. \quad (8)$$

4. PCs' productive and CSR choices

¹² To simplify the analysis, we assume that type- n consumers are member of PCs engaged in the production of differentiated no-SR goods. The same applies to type- c consumers.

¹³ Since $\theta > 1$, the price index P_z is inversely related to product prices; accordingly, higher (lower) prices imply a lower (higher) value of P_z . Thus, P_z can be thought of as an index of the toughness of competition in the market: a higher P_z implies a tougher competitive market. The same applies to the price index of the SR industry, P_j .

We consider a closed economy totally consisting of producer cooperatives operating in a monopolistic competition context.¹⁴ PCs exhibit firm level productivity differences, whereas heterogeneity in productivity concerns the capability to realize different levels of output with the same quantity of inputs; so that productivity differences are independent of product differentiation. We assume that cooperative members and workers coincide and that the working time is the same for all workers.

Each variety κ (with $\kappa = z, j$) of the differentiated goods is produced by a single monopolistically competitive PC, so that κ also indexes cooperative firms. Following standard models of heterogeneous firms,¹⁵ we assume PCs to be heterogeneous in an exogenously fixed productivity parameter which can be interpreted as working ability of the cooperative' members or technical knowhow. The cooperative-specific productivity parameter a_κ is randomly drawn from a continuous probability distribution $G(a)$ and becomes known to the PC only upon paying a production startup fixed cost F_e of units of labour, equal for all cooperatives, required for entry. Thus, PCs face an initial uncertainty concerning their future productivity when they decide to enter the industry. Once the sunk entry cost is paid, cooperatives that earn a positive net revenue survive and produce; all other PCs exit the industry. Surviving cooperatives maximize the income per worker,¹⁶ taking the number of PCs as given.

4.1 *The behavior of non ethical cooperatives*

We first consider the no-SR industry. We assume that production exhibits constant returns to scale, with homogenous labour the only factor of production; yet, productivity may raise physical output for a given level of labour input. Upon entry, the production of physical units by a PC is

$$Y_z = a_z l_z \quad (9)$$

where Y_z is output and l_z is labour input (assumed to be equal to the number of members).

Following Ward (1958), the appropriate short-run maximand for a PC is the dividend or income per worker

$$A_z = \frac{p_z Y_z - F_e}{l_z} \quad (10)$$

¹⁴ For an analysis of cooperatives' behavior in a monopolistic competition setting see Meade (1974).

¹⁵ A huge body of literature followed the seminal paper by Méliitz (2003). Just to mention a few papers: Baldwin (2005), Yeaple (2005), Bernard *et al.* (2007).

¹⁶ PCs' objective amounts to maximizing the income per member, given the assumption stated above that cooperative members and workers coincide.

subject to technological and demand constraints, given by equations (9) and (7). By substituting the technological constraint into equation (10), the maximand may be restated as

$$A_z = a_z \left(p_z - \frac{F_e}{Y_z} \right) \quad (11)$$

With reference to the difference in brackets, we note that the first term represents the PCs' revenue per unit of output, whereas the second term is the fixed cost per unit of output. The net income per worker is then obtained by multiplying the above difference by the productivity parameter a_z . Given the productivity heterogeneity of PCs, it follows an heterogeneity also in the net income per worker, with higher productivity PCs attaining a higher net income per worker.

Each cooperative seeks to maximize A_z with respect to its output:

$$\frac{\partial A_z}{\partial Y_z} = a_z \left(\frac{dp_z}{dY_z} - \frac{d\left(\frac{F_e}{Y_z}\right)}{dY_z} \right) = 0 \quad (12)$$

which requires that the change in the average revenue be equal to the change in the average fixed costs, entailing that the maximum is reached when the two curves have equal slopes. On the other hand, given the constant-return-to-scale technology, both revenue per unit of output and fixed costs per unit of output are tantamount to the same variables per worker, but for the productivity parameter that affects both variables in the same way.¹⁷ Thus, the solution to the optimization problem is independent from a_z . Indeed, the solution to the PC's maximization problem yields the equilibrium price

$$p_z = \left(\frac{R_n}{F_e Z \theta} \right)^{\frac{1}{\theta-1}} P_z \quad (13)$$

that depends on the consumers' income, the elasticity of substitution between varieties and the aggregate price index of no-SR goods – taken as given for the single PC, since we assume a sufficiently large number of PCs. Equation (13) shows that the equilibrium price does not depend on the productivity parameter a_z , as explained above; the same

applies to the PCs' equilibrium output, whose equation is $Y_z = \left(\frac{(F_e \theta)^\theta Z}{R_n} \right)^{\frac{1}{\theta-1}} \frac{1}{P_z}$.

¹⁷ In fact, we have $\frac{p_z Y_z}{l_z} = a_z p_z$ and $\frac{F_e}{l_z} = a_z \frac{F_e}{Y_z}$.

Since the productivity parameter is the only heterogeneous element differentiating PCs, all of them will choose the same optimal price and output. Higher productivity PCs will be able to produce the (common) optimal output by employing fewer members, so that their net income per worker will be higher.

We are thus able to link the viability of cooperatives to the productivity parameter a_z . In fact, as stated above, entry in the no-SR industry requires paying a fixed fee F_e .

Upon drawing their productivity parameters, cooperatives with low productivity cannot obtain a positive net revenue and are not able to survive. The “marginal” PC is characterized by gross revenue per worker equal to its members’ “reservation wage” plus entry fixed costs per worker:

$$\frac{p_z Y_z}{l_z} = \bar{w} + \frac{F_e}{l_z}, \text{ where } \bar{w} \text{ is the “reservation wage”,}$$

defined above, which is assumed to be equal for all members. As standard in heterogeneous firms’ models *à la* Méliitz, the cut-off condition depends on the productivity parameter: in the case of cooperative firms, the higher the productivity level a_z , the greater the gross revenue.

By positing $p_z Y_z = \bar{w} l_z + F_e$, and substituting in it both the equilibrium condition $Y_z = C_{n,z}$ from equation (3) and equations (9) and (11), we find the minimum level of a_z necessary for a cooperative firm to start production:

$$\underline{a}_z = \frac{1}{\theta - 1} \frac{\bar{w}}{P_z} \left(\frac{F_e Z \theta^\theta}{R_n} \right)^{\frac{1}{\theta - 1}} \quad (14)$$

It appears clearly that in the presence of a higher real “reservation wage”, higher fixed entry costs, or lower consumers’ income, cooperatives will start production only once their productivity parameter is higher, since they will need a higher gross revenue to operate in the industry. Albeit surviving cooperatives are heterogeneous with respect to productivity, all PCs with an $a_z \geq \underline{a}_z$ are able to continue to produce due to the imperfect nature of competition. In fact, as long as the elasticity of substitution between varieties, θ , is finite, lower productivity cooperatives are sheltered from competition and may survive, provided the constraint $a_z \geq \underline{a}_z$ is met.

4.2 The behavior of ethical cooperatives

We now turn to the SR industry, which is characterized by two sources of heterogeneity among PCs: they differ in productivity and in the CSR content of the goods produced. As stated above, we exploit the similarity between CSR and “quality” by considering

CSR activities that take place in the productive process: as a consequence, in our model ethical efforts in production lead PCs to manufacture goods embodying CSR features. The production function of ethical goods takes into account the above approach, signaling that for a given labour productivity a_j and labour input l_j (assumed to be equal to the number of members) the output of the j cooperative, Y_j , is reduced by the firm's ethical effort. This effect may be considered as an "indirect" cost linked to CSR activities, i.e., a cost incurred by the cooperative in terms of production loss. The corresponding equation is:

$$Y_j = \frac{a_j l_j}{s_j^\eta} \quad (15)$$

where η is a parameter that represents the elasticity of output with respect to the level of social responsibility. We assume $0 < \eta < 1$, so that when the PC increases the level of ethical content of the good it manufactures there is a less than proportional reduction in the amount produced. Besides the production startup cost F_e of units of labour, equal for all cooperatives and irrespective of the industry in which they operate, we assume that PCs pursuing ethical standards in production incur in additional costs associated with the resources that must be allocated to achieve a given CSR content of output. Therefore, we add a fixed cost in units of labour for pursuing ethical standards, F_s , and a cost that varies positively with respect to the level of SR the cooperative chooses to undertake,¹⁸ $f s_j^\delta$, with constant parameters $f > 0$ and $\delta > 0$. The above elements are to be considered as "direct" costs linked to CSR activities. Thus, the net income per worker of ethical PCs is:

$$A_j = \frac{p_j Y_j - (F_e + F_s + f s_j^\delta)}{l_j} \quad (16)$$

We maintain the assumption that PCs maximize the net income per worker while taking the number of firms as given. By solving its maximization problem, each ethical PC chooses simultaneously its optimal price and the CSR content of the good it produces.

The maximization problem of an ethical PC is:

¹⁸ Yet, note that $f s_j^\delta$ is fixed with respect to the quantity produced.

$$\left\{ \begin{array}{l} \max_{p_j} A_j = \frac{p_j Y_j - (F_e + F_s + f s_j^\delta)}{l_j} \\ \text{s.t. } Y_j = \frac{a_j l_j}{s_j^\eta} \\ Y_j = C_j \\ C_j = \left(\frac{p_j}{P_j} \right)^{-\theta} s_j^{\lambda(\theta-1)} \frac{R_c}{P_j} \end{array} \right. \quad (17)$$

We solve the above maximization problem in two steps: we first determine the PC's optimal price, and then find out the optimal level of the product's CSR content.

As to the first step, by solving the problem stated above, socially responsible PCs obtain the equilibrium price:

$$p_j = \left[\frac{s_j^{\lambda(\theta-1)} R_c}{\theta (F_e + F_s + f s_j^\delta)} \right]^{\frac{1}{\theta-1}} P_j \quad (18)$$

which is the analogous of equation (13) for no-SR goods. In addition to the usual variables of the previous case, when considering ethical cooperatives the optimal price depends positively also on the intensity of the consumers' desire for CSR, as would be expected. Again, since the productivity parameter a_j is the only heterogeneous element differentiating ethical PCs and the solution to the optimization problem does not depend on it, all PCs will choose the same optimal price and output. Instead, PCs' productivity heterogeneity leads to an heterogeneity in the net income per worker, with a positive relation between a_j and A_j .

As in the no-SR industry, upon drawing their productivity parameters, SR cooperatives with low productivity exit the market. Yet, the "cut-off" cooperative is now characterized by gross revenue per worker equal to the "reservation wage" plus total entry fixed costs, the latter including "direct" costs of CSR: $\frac{p_j Y_j}{l_j} = \bar{w} + \frac{F_e + F_s + f s_j^\delta}{l_j}$.

Again, we are able to find the "cut-off" level of the productivity parameter necessary for a PC to start production:

$$\underline{a}_j = \frac{1}{\theta-1} \frac{\bar{w}}{P_j} \left[\frac{(F_e + F_s + f s_j^\delta) \theta^\theta}{R_c} \right]^{\frac{1}{\theta-1}} s_j^{\eta-\lambda} \quad (19)$$

Also in the case of ethical cooperatives, the presence of a higher real "reservation wage", higher fixed entry costs, or a lower consumer's income, requires a higher productivity parameter in order to generate a sufficient level of the gross revenue per

worker to start production. As to the relation of the “cut-off” level of the productivity parameter, \underline{a}_j , with the product’s CSR content, s_j , we note that the sign of the corresponding derivative is ambiguous

$$\frac{d\underline{a}_j}{ds_j} = \frac{1}{\theta-1} \frac{\bar{w}}{P_j} \left(\frac{\theta^\theta}{R_c} \right)^{\frac{1}{\theta-1}} (F_e + F_s + fs_j^\delta)^{\frac{1}{\theta-1}} s_j^{\eta-\lambda-1} \left\{ (\eta-\lambda) + \frac{s_j^\delta f \delta}{\theta-1} (F_e + F_s + fs_j^\delta)^{\frac{2-\theta}{\theta-1}} \right\}$$

since it reflects the working of diverging influences: on the one hand, a high appreciation of ethical goods by “concerned” consumers promotes market demand and thus reduces the productivity parameter cut-off level; on the other hand, cooperative firms producing ethical goods incur in “direct” and “indirect” costs, implying that the minimum level of a_j necessary to trigger production increases with the level of CSR. The net result depends on the relative strength of such effects.

Again, all infra-marginal PCs, with an $a_j \geq \underline{a}_j$, are able to continue to produce because of the imperfect nature of competition.

All cooperatives with a productivity parameter higher than the “cut-off” one endogenously choose the level of CSR resulting from the solution of the net per worker income maximization problem. Thus, the optimal level of CSR s_j^* is obtained by solving the following maximization problem:

$$\left\{ \begin{array}{l} \max_{s_j} A_j = \frac{p_j Y_j - F_e - F_s - f s_j^\delta}{l_j} \\ \text{s.t. } Y_j = \frac{a_j l_j}{s_j^\eta} \\ Y_j = C_{c,j} \\ C_{c,j} = \left(\frac{p_j}{P_j} \right)^{-\theta} s_j^{\lambda(\theta-1)} \frac{R_c}{P_j} \\ p_j = \left[\frac{s_j^{\lambda(\theta-1)} R_c}{\theta (F_e + F_s + fs_j^\delta)} \right]^{\frac{1}{\theta-1}} P_j \end{array} \right. \quad (20)$$

where, among the constraints, we include the optimal price obtained from the first step of the maximization problem. The second step yields the following solution:

$$s_j^* = \left\{ \frac{(F_e + F_s)(\lambda-\eta)(\theta-1)}{f[\delta - (\lambda-\eta)(\theta-1)]} \right\}^{\frac{1}{\delta}} \quad (21)$$

which is positive if the following conditions hold: $\lambda > \eta$ and $0 < (\theta-1)(\lambda-\eta) < \delta$. The former condition affirms that a rise in s_j must entail a reduction in the amount produced

by SR cooperatives which is lower than increase in consumers' utility, implying that "CSR pays," i.e. consumer's marginal valuation of CSR exceeds the marginal loss of production for cooperatives, that is the marginal "indirect" CSR cost. As to the latter condition, it states that the elasticity of substitution θ must not be so high to create benefits of CSR "overwhelming" the "direct" cost of CSR. Both conditions assure that the solution in terms of the level of CSR exists and is positive.

From equation (21) we note that the optimal CSR increases with λ , the intensity of ethical features in consumers' demand, thus validating the role of the "bottom-up pressure": cooperatives have an economic interest in sustaining both direct and indirect costs of producing CSR goods, given consumers' willingness to pay for them; the higher the intensity of the preference of "concerned" consumers for CSR goods, the higher the optimal level of CSR, provided that the condition $\lambda > \eta$ is satisfied. Moreover, the optimal CSR decreases with η and δ , that capture the intensity of the "indirect" and "direct" costs of manufacturing CSR products, i.e., the incidence of CSR activity on production decrease and variable CSR costs, respectively.

Finally, from equation (21) it appears that the optimal amount of CSR is independent of the productivity parameter a_j : such a result is not surprising since the latter does not affect PCs' optimal choices in terms of price and output.

5. Concluding remarks

On the basis of a "strategic" approach to CSR encouraged by consumers' "bottom up pressure", we built a model of vertical product differentiation that assumes CSR as a "quality" differentiation criterion. The innovative contribution of the model consists in considering a type of product differentiation which is based on the adoption of socially and environmentally responsible practices, and in analyzing cooperatives' ethical engagement in a contest of productivity heterogeneity and monopolistic competition.

We derive each producer cooperative's optimal choices with reference both to prices and the level of ethical standards. Albeit cooperatives differ with respect to the productivity of their members/workers, the solutions to both optimization problems are the same for all cooperatives, pointing to heterogeneity in the net income per worker. This result suggests that more productive PCs may be able to limit the income distributed to each member, utilizing the difference to strengthen their self-financing capacity, which turns out to be of the utmost importance in times of financial crisis

when credit is limited and creditors try to discern among borrowing firms. The heterogeneity in disposable cash-flow clearly determines a differentiated capacity in accessing the financial market. Albeit we did not go through the above aspects, they may be a line for future development of the model presented in the paper.

As to PCs' engagement in CSR activities, we find that the level of ethical effort cooperatives optimally choose is influenced both by demand- and supply-side variables, and specifically by the intensity of ethical features in consumers' demand and the elasticity of output with respect to social responsibility activities that take place in the productive process.

Accordingly, our analysis confirms the role of consumers' "bottom-up pressure", since the consumers' appreciation of the CSR content of goods creates an incentive for cooperatives to produce ethical goods – notwithstanding both the increase in their costs and the reduction in their output. In addition, our model highlights that the role of consumers' "bottom-up pressure" is even greater than commonly assumed, considering that the intensity of the preference of "concerned" consumers for CSR goods positively impacts on the level of ethical standards endogenously chosen by the cooperative firms.

References

- Antoniades A. (2008), "Heterogeneous Firms, Quality, and Trade", *incomplete draft*, <http://www.columbia.edu/aa2182/research.htm>.
- Baldwin R. (2005), "Heterogeneous firms and trade: Testable and untestable properties of the Méltitz model", *NBER Working Paper* 11471, June.
- Barin-Cruz L., Boehe D. M. (2010), "Corporate Social Responsibility, Product Differentiation Strategy and Export Performance", *Journal of Business Ethics*, 91, 325–346.
- Baron D. (2001), "Private Politics, Corporate Social Responsibility and Integrated Strategy," *Journal of Economics and Management Strategy*, 10, 7–45.
- Becchetti L., Cremonese L., D'Achille E., Meo P., Venturini L. (2006), "Le preferenze e la spesa dei consumatori equosolidali: un'analisi empirica sui consumatori italiani" in Becchetti L., Costantini M. (a cura di), *Il commercio equo e solidale alla prova dei fatti: dai consumatori del Nord ai produttori del Sud del mondo*, Mondadori, Milano.
- Becchetti L., Giallonardo L., Tessitore M.E. (2007), "On Ethical Product Differentiation With Asymmetric Distance Costs", *Rivista di Politica Economica*, September-October, 55-81.

- Becchetti, L., Rosati F. (2007), "Globalisation and the Death of Distance in Social Preferences and Inequity Aversion: Empirical Evidence from a Pilot Study on Fair Trade Consumers", *The World Economy*, 30 (5), 807-30.
- Bernard A.B., Redding S.J., Schott P.K. (2007), "Comparative Advantage and Heterogeneous Firms", *Review of Economic Studies*, 74(1), 31-66.
- Besley T., Ghatak M. (2007), "Retailing public goods: The economics of corporate social responsibility", *Journal of Public Economics*, 91, 1645–1663.
- Carrasco I. (2007), "Corporate Social Responsibility, Values, and Cooperation", *International Advances in Economic Research*, 13 (4), 454-60.
- Cavallaro E., Mulino M. (2009), "Technological Catching Up, Competitiveness and Growth", *Journal of International Trade & Economic Development*, 18 (4), 505-525.
- Edmans A. (2009), "Does the Stock Market Fully Value Intangibles? Employee Satisfaction and Equity Prices", *Wharton School, University of Pennsylvania Working Paper*.
- European Commission (2002), *Communication from the Commission concerning Corporate Social Responsibility: A business contribution to Sustainable Development*, Brussels, COM(2002) 347 final.
- Fisman R., Heal G., Nair V. (2006), "A Model of Corporate Philanthropy", *Wharton School, University of Pennsylvania Working Paper*.
- Friedman M. (1977), "The social responsibility of Business is to make profits", in Steiner G.A., Steiner J.F. (Eds.), *Issues in Business and society*, New York, Random House.
- Grossman, G., Helpman, E. (1991), *Innovation and growth in the global economy*, Cambridge, Massachusetts, MIT Press.
- Hallak J.C., 2010, "A Product-quality view of the Linder Hypothesis", *The Review of Economics and Statistics*, XCII (3), 453-66.
- Hallak J. C., Sivadasan J. (2009), "Firms' exporting behavior under quality constraints", *NBER Working paper No. 14928*.
- Harjoto M.A., Jo H. (2011), "Corporate Governance and CSR Nexus", *Journal of Business Ethics*, 100, 45-67.
- Heble M., Okubo T. (2008), "Heterogeneous Quality Firms and Trade Costs", *The World Bank, Policy Research Working Paper*, 4550, March.
- Horowitz A.R., Horowitz I. (1999), "Quality Choice: Does It Matter Which Workers Own and Manage the Cooperative Firm?", *AEJ*, 27(4), 394-409.
- Hummels D., Klenow P. (2005), "The Variety and Quality of a Nation's Exports", *American Economic Review*, 95 (3), 704-723.
- Johnson R. (2010), "Trade and prices with heterogeneous firms", Dartmouth College, *University of California at Berkeley, mimeo*.

- Martin R.E. (1986), "Quality Choice under Labour-Management", *Journal of Comparative Economics*, 10(4), 400-13.
- McWilliams A., Siegel D. (2001), "Corporate Social Responsibility: A Theory of the Firm Perspective", *Academy of Management Review*, 26, 117–127.
- McWilliams A., Siegel D. S., Wright P.M. (2005), "Corporate Social Responsibility: Strategic Implications", *Rensselaer Working Papers in Economics*, May 2005.
- Meade J.E. (1974), "Labour-Managed Firms in Conditions of Imperfect Competition", *The Economic Journal*, 84, 336, 817-24.
- Méltz M. (2003), "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity", *Econometrica*, 71 (6), 1695-1725.
- Sacco P.L., Viviani M. (2005), "La Responsabilità Sociale d'Impresa. Un percorso a partire dal dibattito italiano", *AICCON - Università di Bologna, Working Paper* n. 11, Aprile.
- Ward B. (1958), "The Firm in Illyria: Market Syndicalism", *The American Economic Review*, 48 (4), 566-89.
- Yeaple S.R. (2005), "A simple model of firm heterogeneity, international trade, and wages", *Journal of International Economics*, 65, 1–20.