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Three Essays on Ethical Consumption and Social Responsibility

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alla mia famiglia

The undersigned Domenico Fanelli, in his quality of doctoral candidate for a Ph.D. degree in Economics and Organization granted by the Università Ca' Foscari di Venezia, the Advanced School of Economics (SSE) and Fondazione Scuola Studi Avanzati in Venezia attests that the research exposed in this dissertation is original and that it has not been and it will not be used to pursue or attain any other academic degree of any level at any other academic institution, be it foreign or Italian.

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Summary

Research into Corporate Social Responsibility (CSR) can be traced back to an important question in the political and economic debate: do firms have any kind of social responsibility beyond the maximization of profits? This question is at the core of two articles written by Friedman (1970) and Arrow (1973). Both economists claim that the role of firms is to maximize profits as long as it stays within the rules embodied in law and in ethical custom, while the role of institutions is to establish the rules to prevent or repair the socially inefficient outcomes due to the maximization of profits. Whatever the opinion of the two economists, nowadays firms engage in CSR. A firm that commits to CSR – *ethical firm* – voluntarily undertakes an action which goes beyond legal requirements. There are several forms of CSR depending on which stakeholder the action is communicated to: consumers, investors, institutions. In this dissertation we focus on *CSR addressed to consumers*.

One example of CSR is Fair-Trade. Fair-Trade is an alternative approach to conventional trade of agricultural products in less developed countries. In these countries, monopsonistic power of multinational food companies push prices of agricultural products produced by small farmers below the level that would be reached in a competitive market. The Fair-Trade labeling system supports these farmers: farmers that respect standards set by the Fair Trade Labelling Organizations International (such as guaranteeing decent wages to workers and providing adequate housing where relevant) can label their products with the Fair-Trade certification mark and these products are sold to consumers of developed countries at a price that guarantees to fair-trade producers and workers decent wages.

A CSR action is usually costly and firms may find it convenient to invest in CSR because some consumers – *socially concerned consumers* – positively value CSR commitments of firms. This phenomenon is called ethical consumption. Many surveys and opinion polls show that the majority of consumers have a positive attitude towards CSR (see Environics International, 1999; MORI, 2000; The Co-operative Bank, 2007); however there appears to be a divergence between these findings and the volume of sales of ethical

products: although in the last years there has been a substantial increase in investment in CSR activities in all OECD nations (see Paton and Siegel, 2005), ethical market is still a small proportion of the total annual household consumer spending (see, for instance, The Co-operative Bank, 2007; Tallontire et al., 2001). Not all the consumers who declare to be socially (or environmentally) concerned purchase ethical firms' products. Starting from such divergence and its possible explanations we develop our dissertation, which is composed of three chapters in the form of self–contained papers.

In Chapter 1, we present a comprehensive survey of recent contributions in economics on CSR addressed to consumers. These contributions go beyond the debate on whether firms should undertake a CSR action and include CSR differentiation strategies of firms and social preferences of consumers in partial equilibrium models. Each contribution analyzes a different aspect of CSR but, amongst these, only few contributions assume that CSR is a good whose quality can not be evaluated by consumers even after consumption (i.e. a credence good). Indeed this characteristic of CSR may explain why many potentially socially concerned consumers prefer not to buy CSR firms' products and this, in turn, can be a possible explanation of the divergence between attitudes of consumers towards CSR and sales of CSR firms' products. Thanks to the assumption of CSR as a credence good we can also link recent contributions on CSR to the debate undertaken by Friedman (1970) and Arrow (1973): CSR can survive only if consumers can discern its quality and this may be guaranteed only if CSR is embodied in some definite and widely accepted social institution. In Chapter 1, we firstly present the thesis of the two economists, then we review recent literature in economics on CSR and, finally, we link this literature to the thesis of the two economists assuming that CSR is a credence good.

Most of the recent contributions on CSR are similar in their structure to traditional product differentiation models where firms offer different qualities of products at different segments of the market. These contributions are usually two-stage games in which firms first choose their optimal commitments to CSR and then choose either prices or quantities. Firms are profit-maximizing and consumers are heterogeneous in their tastes over CSR. CSR is usually assumed to be costly and it increases either variable or fixed production costs depending on which CSR action is studied. The majority of these contributions assume that the *entire* population of consumers are socially (or environmentally) concerned in the sense that they are willing to pay a price premium for buying ethical firms' products. Only Besley and Ghatak (2007) and Rodrìguez-Ibeas (2007) assume two types of consumers: socially concerned and *traditional consumers*, where traditional consumers do not give any value to the CSR attributes of products. However, also

these two articles do not analyze how the specific sizes of the two groups of consumers affect firms' decision to commit to CSR.

In Chapter 2 we investigate how the size of socially concerned consumers' group affects firms' decisions to commit to social responsibility. As in Besley and Ghatak (2007) and Rodrìguez-Ibeas (2007), we assume that there are two types of consumers: socially concerned and traditional consumers. However we assume that socially concerned consumers desire to have a market in which firms commit to CSR, in a framework where the goods produced by firms are considered entirely homogeneous by the two groups of consumers. This assumption is made to interpret the stylized divergence between positive attitudes of consumers towards CSR and sales of ethical firms' products. We analyze a two-stage duopoly game in which firms first decide either to invest or not in CSR and then compete over quantities (a là Cournot). The ethical firm bears a higher variable cost than a firm who does not invest in social responsibility – *standard firm*. We find that when either the group of socially concerned consumers is large enough or the cost of CSR is low, there exists two asymmetric Nash Equilibria in pure strategies in which an ethical and a standard firm coexists in the same market, and each firm obtains positive equilibrium profits. Under these conditions, there also exists a symmetric Nash Equilibrium in mixed strategies in which firms choose to be ethical with positive and identical probabilities. Otherwise, there exists a symmetric Nash Equilibrium in pure strategies in which both the two firms choose to be standard. We present a simple evolutionary model to study under what conditions this equilibrium outcome is robust to evolutionary pressures. We assume that the economy is composed by a single large population of firms divided into two groups: the group of ethical firms and the group of standard firms. Firms are pairwise randomly matched and payoffs gained by firms in each possible match are given by the equilibrium profits obtained by firms in the second stage of the two-stage game. We look for an evolutionary stable population state (an Evolutionary Stable Strategy, ESS) and we find that, when either the group of socially concerned consumers is large or cost of CSR is low, the unique ESS of the model corresponds to the unique symmetric mixed-strategy equilibrium of the two-stage game. This implies that equilibrium mixed strategies of the two-stage game represents the evolutionary stable population state of our model, where the probability to commit to CSR represents the stable population share of ethical firms in the economy. Hence, at the ESS, ethical and standard firms coexists. The same result is obtained in a dynamic framework (using the Replicator Dynamics). When either the cost of CSR is high or socially concerned consumers group is of a small size, results are different: at the ESS market is entirely composed of standard firms. We conclude Chapter 2 studying two kinds of policies: a pol-

icy that increases the number of socially concerned consumers and a policy that reduces the cost of CSR. We investigate the effects of these two policies on the stable population shares of firms and, intuitively, we find that either an increase in the number of socially concerned consumers or a reduction of the cost of CSR induces an expansion of ethical firms in the economy. However only the policy which reduces cost of CSR is able to induce the economy to be entirely composed of ethical firms.

In Chapter 3 we present a general equilibrium model in which we investigate the role of income distribution in the diffusion of CSR. Many studies show that income distribution is a crucial variable in determining ethical firms' demand (see Starr, 2009, Livraghi, 2007a and D'Alessio et al., 2007a). These studies show that consumers that purchase ethical commodities usually have a medium-high level of income implying that only the richest share of socially concerned consumers can afford ethical commodities. This, in turn, may explain the aforementioned divergence as a phenomenon related to both the price of ethical commodities and the income of consumers. We assume that the economy is divided into two sectors, the standard and the ethical. In each sector a representative firm operates. We make two assumptions. i) Traditional consumers consider the goods produced by the two sectors as perfect substitutes while socially concerned consumers have nonhomothetic preferences: as the attainable level of utility increases, the preference for ethical products rises. As a result, an increase in income may induce socially concerned consumers to switch from standard to ethical products rather than consuming more of standard goods. ii) Only one group of workers receives a share of profits in addition to wages. This implies that consumers' demands depend not only on preferences, but also on income distribution. Hence, we can investigate whether income inequality is a deterrent to CSR growth. Under these assumptions the model admits one single equilibrium. However, depending on the values of parameters, different scenarios may arise, each characterized by a different extent of the ethical sector. The extent of each sector is given by the fraction of the total labor force employed in that sector. Preferences and the presence of two classes of income can produce four different cases: all consumers purchase ethical goods (this happens when the price of ethical goods is lower than the price of standard goods), only socially concerned consumers purchase ethical goods, only socially concerned consumers getting the share of profits purchase them, no one does it. The relation between the price of ethical goods and the two classes of income determines which of these situations can emerge. This result is relevant because the emergence of one equilibrium rather than another influences income inequality. We find that, under plausible conditions the increase in the size of the ethical sector is associated with a reduction of inequality. In this case

there exists a virtuous circle between two policy goals: the expansion of the ethical sector and the reduction of inequality. Under these conditions any policy which promotes the diffusion of CSR induces a reduction of income inequality. By contrast, when such conditions do not apply, we show that only redistributive policies can promote both a reduction of inequality and an increase in CSR diffusion.

Chapter 1

Corporate Social Responsibility Addressed to Consumers

Abstract

Do firms have any kind of social responsibility beyond the maximization of profits? This question is at the core of two articles written by Friedman (1970) and Arrow (1973). Both economists claim that the role of firms is to maximize profits while the role of institutions is to establish the rules that prevent or repair the socially inefficient outcomes due to the maximization of profits. Whatever the opinion of the two economists, nowadays firms engage in Corporate Social Responsibility (CSR) and consumers positively value CSR commitments of firms. The aim of this chapter is to provide a comprehensive survey of recent contributions in economics on CSR addressed to consumers. This literature goes beyond the debate on whether firms should undertake a CSR action and include CSR differentiation strategies of firms and social preferences of consumers in partial equilibrium models. We conclude the chapter discussing an unexplored line of research on these topics which may give new relevance to the thesis of the two economists.

1.1 Introduction

Do firms have any kind of social responsibility beyond the maximization of profits? This question is at the core of two articles written in the 70's by two prominent economists, Milton Friedman and Kenneth Arrow (see Friedman, 1970 and Arrow, 1973). The answer of the two economists converges: both claims that the role of firms is to maximize profits as long as it stays within the rules embodied in law and in ethical custom, while the role of institutions

is to establish the rules that prevent or repair the socially inefficient outcomes due to the maximization of profits. Hence the two economists make a clear distinction between the roles of firms and institutions: firms can commit to social responsibility only if this action is embodied in some definite and widely accepted social institution.

Whatever the opinion of the two economists, nowadays firms engage in Corporate Social Responsibility (CSR). CSR is defined as "[a] concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis" (see Green Paper, 2001). There are several forms of CSR depending on which stakeholder the action is communicated to: consumers, investors, institutions. In this chapter we focus on CSR addressed to consumers. One example is Cause-Related Marketing (CRM). In CRM the company specifies a maximum amount of money it will contribute to a nonprofit organization or a social cause when consumers purchase its products.

Even if CSR actions are usually costly, firms find it convenient to commit to CSR because consumers positively value CSR commitments of firms. This phenomenon is called Ethical Consumption (EC). EC is the consumption based on ethical values, such as the consumption of products linked with good causes (e.g. CRM products) or products labeled as social and environmental. A recent literature shows that consumers are socially (or environmentally) concerned in the sense that they positively value the CSR activities of firms (see Environics International, 1999; MORI, 2000; The Co-operative Bank, 2007).

The aim of this chapter is to analyze the recent literature on CSR and EC in economics. In Section 1.2 we provide a description of CSR and EC without entering the economics analysis. In Section 1.3 we first present the thesis of Friedman (1970) and Arrow (1973) and then we review recent contributions in economics on CSR and EC. These contributions go beyond the debate on whether firms should undertake a CSR action (see Friedman, 1970 and Arrow, 1973) and assume that CSR is a strategy adopted by firms to differentiate their products. These contributions are usually two-stage games in which firms first choose their optimal commitments to CSR and then choose either prices or quantities. Firms are profit-maximizing and consumers are heterogeneous in their tastes over CSR. CSR is usually assumed to be costly and it increases either variable or fixed production costs depending on which CSR action is assumed. The majority of these contributions adopt a vertical differentiation approach: socially concerned consumers are willing to pay a price premium to buy CSR products and consider these goods as of higher quality than goods without any CSR attribute. Others assume an horizontal differentiation approach. In equilibrium, firms positively commit to CSR de-

pending on both the cost of CSR and preferences of consumers. Welfare may either increases or decreases depending on the specific framework adopted. Amongst these contributions only few of these assume that CSR is a good whose quality can not be evaluated by consumers even after consumption (i.e. a credence good). Indeed there is evidence that consumers often do not have information about the social, ethical and environmental performance of brands, and even when this information exists, it is costly to retrieve it. Moreover credibility of CSR is often criticized by activists' groups since there are cases in which companies do not provide the promised level of CSR (see Christian Aid, 2004; Corporate Watch, 2006). As a result consumers may be not aware of the true quality of the CSR actions offered by firms. This, in turn, may give new relevance to the debate undertaken by Friedman (1970) and Arrow (1973): CSR can survive only if consumers can discern its quality and this may be guaranteed only if CSR is embodied in some definite and widely accepted social institution (see Arrow, 1973).

In Section 1.4, we provide some arguments in favor of the assumption that CSR is a credence good and we link such arguments to the debate undertaken by Friedman (1970) and Arrow (1973). Section 1.5 concludes the chapter.

1.2 CSR and Ethical consumption

In this Section we establish the boundaries of our analysis providing a description of corporate social responsibility and ethical consumption.

1.2.1 Corporate Social Responsibility

One definition of corporate social responsibility (CSR), amongst others, is that provided by Green Paper (2001); in this document, CSR is defined as "[a] concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis".

A firm that commits to CSR voluntarily undertakes an action which goes beyond legal requirements. Any CSR action can involve different groups of stakeholders. In particular, an important distinction should be made between those who directly benefits from the CSR action and those to whom the action is communicated to. There are several ways to communicate CSR activities; some examples are product labeling, social reports, information through the web, awards, events and press releases. Different ways of communicating a CSR action implicitly indicate different audiences to whom the action is addressed. In this chapter we exclusively focus on CSR actions addressed to

consumers. Examples are Fair-Trade, environmental labeling, Cause-Related Marketing (CRM) and Corporate Philanthropy (CP).

Fair-Trade is an alternative approach to conventional trade of agricultural products in less developed countries. In these countries, monopsonistic power of multinational food companies push prices of agricultural products produced by small farmers below the level that would be reached in a competitive market. The Fair-Trade labeling system supports these farmers with better trading conditions: farmers that respect standards set by FLO International[1] (such as guaranteeing decent wages to workers, ensuring health and safety standards and providing adequate housing where relevant) can label their products with the Fair-Trade certification mark. Fair-Trade products are sold to consumers of developed countries at a price that guarantees to fair-trade producers and workers decent wages. Fair-Trade products are addressed to consumers of developed countries but beneficiaries of Fair-Trade are small farmers of less developed countries. Another example of CSR addressed to consumers is the so called eco-label; examples of eco-labels are the Nordic Swan Label, the European Union's Ecoflower and the German Blue Angel. To obtain these certifications, goods must be produced under several environmentally friendly criteria; in this case, the stakeholder who benefits from an eco-label is the entire society. Other examples are CRM and CP. In both cases, firms donate a given amount of money to social causes[2]: in CRM, the contribution is linked to sales while in CP it is not (see W. Wymer Jr. and P. Knowles and R. Gomes, 2006). The social cause or the programmes pursued by the nonprofit organization identify the stakeholders who benefit from CRM and CP actions[3].

The analysis of CSR is still in a embryonic stage and issues regarding frameworks, measurement, and empirical methods have not been resolved (see Paton and Siegel, 2005). For instance, it is difficult to measure the level of a CSR action undertaken by a firm since CSR activities vary both across firms and industries and data are usually not publicly available. As a result empirical literature uses as proxy of CSR financial indexes and ratings of firms provided by private societies such as KLD Research & Analytics[4].

[1] Fairtrade Labelling Organizations International

[2] One of the first examples of CRM was in 1983, "when funds were being solicited to restore the Statue of Liberty. American Express created a campaign and contributed a few cents each time its customers used their American Express cards in a transaction." (See W. Wymer Jr. and P. Knowles and R. Gomes, 2006).

[3] Existing literature on CRM and CP evidences that the level of philanthropic donations and CRM campaigns made by businesses has grown significantly over the last years (see, as an example, Campbell et al., 2002; Drumwright, 1996; Smith and Stodghill, 1994; Webb and Mohr, 1998).

[4] See www.kld.com.

Any CSR action can either increases or decreases costs of firms; the opinion of McWilliams and Siegel (2001) is that examples in which a CSR action reduces firms' costs are rare whereas examples of higher costs abound; however no empirical studies offers a clear analysis on costs of CSR.

Through advertising firms are able to communicate to consumers their activities on CSR. Whatever is the motivation behind the CSR action, any firm that advertises its CSR activities is selling its CSR attributes to a share of consumers which positively value CSR commitments of firms. This phenomenon is called Ethical Consumption (EC); we illustrate it in the following subsection.

1.2.2 Ethical Consumption

Ethical consumption (EC) is the consumption based on ethical values, such as consumption of products linked with good causes (e.g. CRM products) or products labeled as social and environmental (e.g. Fair-Trade or eco-labeled products). Tallontire et al. (2001) distinguish three types of ethical consumerism: positive ethical purchase behavior, negative ethical purchase behavior and consumer action. Consumer action indicates that "activities other than purchasing, such as dialogue with retailers and manufacturers or lobbying of government"; negative ethical purchase behavior identifies activities such as boycotting or "avoiding goods with unethical characteristics"; positive ethical purchase behavior is the activity of buying goods with ethical attributes (see Tallontire et al., 2001). We exclusively focus on this last type of consumer behavior since it is the most adopted to describe EC in economics[5].

Many surveys and opinion polls show a predisposition of consumers to CSR activities of firms (see Environics International, 1999; MORI, 2000; The Co-operative Bank, 2007). In MORI (2000), the first study devoted to social responsibility conducted across twelve European countries, "70% of European consumers say that a company's commitment to social responsibility is important when buying a product or service" and "around two in five have also bought a product or service because of its links with good causes, or a product that was labelled as social, ethical or environmental". A similar predisposition of consumers is also evidenced in Environics International (1999), which is a survey involving representative samples of 1000 citizens in each of 23 countries on 6 continents. This survey reveals that "two in three citizens want companies to go beyond their historical role of making a profit

[5]Studies that assume consumer action and negative ethical purchase behavior in economics are Baron, 2002; Innes, 2006; Glazer et al., 2008)

[...]; they want companies to contribute to broader societal goals as well", and "fully half the population in countries surveyed are paying attention to the social behavior of companies". Positive attitudes of consumers toward CSR have also been extensively studied by Marketing and Business Sciences (see, for instance, Webb and Mohr, 1998; Mohr et al., 2001). In Webb and Mohr (1998) and Mohr et al. (2001), authors explore what consumers think and feel about CSR and find that most respondents are positive toward a company involvement in CSR.

Whatever the attitudes of consumers, literature on EC has also focused its attention to model positive ethical consumption behavior. In particular, some works show that there is evidence that consumers who buy ethical products are willing to pay a price premium (see, for instance, Bjorner et al., 2004; Cotte and Trude, 2008; De Pelsmacker et al., 2005; Elfebein and McManus, 2007; Rode et al., 2008). In Cotte and Trude (2008), authors conduct a series of experiments in order to investigate whether consumers reward good corporate behavior. In all tests, authors find that consumers are willing to pay a slight premium for the ethically made products and that buyers would buy unethically made products only at a steep discount. Similar findings are obtained by Rode et al. (2008); authors conducted triopolistic market experiments "to explore the behavior of economic actors when a traded good involves an ethical dimension and when selling the ethically differentiated version of the good implies an increase in production costs"; in particular, they show that "producers price products with higher costs at a premium and that many consumers accept to pay this premium when it is linked to an ethical differentiation". Finally, Bjorner et al. (2004) find that an eco-label (the Nordic Swan Label) has had "a significant effect on consumers' brand choices [...] corresponding to a marginal willingness to pay for the certified environmental label of 13-18 % of the price" (see Bjorner et al., 2004).

Other studies on EC investigate whether ethical consumption is dependent on some variables such as gender, income, education, political activism and social norms. These studies usually show that people are more likely to buy ethically when, *ceteris paribus*, their income and education is elevate and when others around them do too. Moreover there is evidence that women and people with a strong interest in politics are more likely to buy ethically (see, for instance, D'Alessio et al., 2007b; Livraghi, 2007b; Starr, 2009).

1.3 CSR and EC in economics

Research into CSR can be traced back to an important question in the political and economic debate: do firms have any kind of social responsibility

beyond the maximization of profits? This question is at the core of two articles written by Friedman (1970) and Arrow (1973).[6] Whatever the answer to this question, recent contributions in economics go beyond this debate and include CSR actions of firms and EC in economics models. In what follows, we first summarize the thesis of the two economists and then we give a review of the literature on CSR and EC in economics[7].

1.3.1 Friedman and Arrow on social responsibility

The title of Friedman (1970), "The Social Responsibility of Business is to increase its Profits", immediately clarifies author's opinion on CSR: the only responsibility of firms is to make profits while conforming to the basic rules of society, both those embodied in law and in ethical custom. In a private-property system, a corporate executive is an employee – an agent – of the owners of the business – the principals – and his responsibility is to conduct the business in accordance with owners' desires. Since social responsibility, if it is not pure rhetoric, is an action which is not in the interest of the owners[8], the corporate executive that commits to social responsibility is: (1) reducing returns to stockholders, (2) raising the price to customers, and (3) lowering the wages of some employees (see Friedman, 1970). Hence, the corporate executive who commits to CSR is in effect imposing taxes and deciding how the tax proceeds shall be spent. This is intolerable for two reasons: (1) the imposition of taxes and the expenditure of tax proceeds are governmental functions which should be exclusively executed by civil servants elected through a political process, (2) a corporate executive is not an expert on deciding how taxes should be imposed and how tax proceeds shall be spent. The author concludes the article criticizing the doctrine of CSR since, in his opinion, it does not differ in philosophy from the most explicitly collectivist doctrine.

Three years after Friedman (1970)'s publication, Kenneth Arrow wrote an article on social responsibility titled "Social Responsibility and Economic

[6]Many economists entered this debate; recently also the nobel laureate Gary Becker wrote an article titled "Do Corporations Have a Social Responsibility Beyond Stockholder Value?" (see Becker, 2005); in Becker (2005), author essentially agrees with Friedman (1970)'s opinion on CSR.

[7]A survey on CSR and economics is also Kitzmueller (2008).

[8]In Friedman (1970) a social responsibility action cannot be in the interest of stockholders: "Of course, in practice the doctrine of social responsibility is frequently a cloak for actions that are justified on other grounds rather than a reason for those actions. To illustrate, it may well 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."

Efficiency". At the beginning of its article, author declares: "There is widespread notion that the individual has some responsibility to others in conduct of his economic affairs. It is held that under a number of circumstances the economic agent should forgo profit or other benefits to himself in order to achieve some social goal" (Arrow, 1973). Arrow (1973) indicates two types of situations in which maximization of profits is socially inefficient and undesirable: "the case in which costs are not paid for, as in pollution, and the case in which the seller has considerably more knowledge about his product than the buyer, particularly with regard to safety". Even if such words could suggest that Arrow's opinion on CSR is exactly the opposite of that of Friedman (1970), this is not the case: when maximization of profits is socially inefficient, it is desirable to have some idea of social responsibility which, however, has to be embodied in some definite social institution[9]; Arrow (1973) analyzes four classes of institutions: legal regulation, taxes, legal liability and ethical codes. The first three institutions are exclusively governed by the political process and only the fourth institution can be embodied in a CSR action directly undertaken by firms. In this last case, however, for "ethical codes" Arrow (1973) intends a code of conduct accepted by all firms and transmitted from one generation of executives to the next through standard operating procedures. Hence, Arrow (1973)'s ethical codes are essentially what Friedman (1970) called "ethical custom", which, together with law, is, in Friedman's opinion, the only constraint a firm should take into consideration when it maximizes profits.

We can conclude that the two economists share the same basic opinion on CSR: the role of firms is to maximize profits as long as it stays within the rules embodied in law and in ethical custom, while the role of institutions is to establish the rules to prevent or repair the socially inefficient outcomes due to the maximization of profits. The differences between the two articles lies essentially in their contents: Friedman (1970) focuses on the reasons why firms should not undertake a CSR action, while Arrow (1973) analyzes the cases in which firms' activity should be restrained by law or ethical codes.

1.3.2 Contributions on CSR and EC in economics

Recent contributions in economics go beyond the debate on whether firms should undertake a CSR action and include CSR activities of firms and EC in economics models. Articles in this strand of literature have been made, amongst others, by Arora and Gangopadhyay (1995), Amacher et al. (2004), Alves and Santos-Pinto (2008), Bagnoli and Watts (2003), Besley and Ghatak

[9]Arrow (1973) uses the term "social institution" in a broad sense.

(2007), Becchetti and Solferino (2003), Conrad (2005), Davies (2005), Drydakis and Vlassis (2007), Feddersen and Gilligan (2001), Graichen (2008), Garcìa-Gallego and Georgantzìs (2009), Manasakis et al. (2007), Mitrokostas and Petrakis (2008), Noe and Rebello (1995) and Rodrìguez-Ibeas (2007). The aim of this Section is to illustrate these studies. We first analyze how CSR and EC enters in these models and then we provide a brief summary of each study.

These contributions are partial equilibrium models[10] in which firms use CSR to differentiate their products[11]. All studies but Davies (2005) assume that CSR is costly and higher costs are associated to increasing levels of CSR[12]. In most studies, CSR activities increase variable production costs. This is not the case in Arora and Gangopadhyay (1995), Drydakis and Vlassis (2007), Feddersen and Gilligan (2001) and Garcìa-Gallego and Georgantzìs (2009), where CSR is considered as a fixed production cost. Bagnoli and Watts (2003) assume that CSR implies an increase in either fixed or variable production costs. Different assumptions on CSR costs depend on which CSR action is adopted by firms: as an example, Bagnoli and Watts (2003) analyze two different CSR strategies, CRM and CP; CRM makes variable production costs higher, while CP increases fixed production costs.

On the consumers' side, most studies assume that the *entire* population of consumers positively value the CSR attributes of products[13]; Besley and Ghatak (2007) and Rodrìguez-Ibeas (2007) assume instead two types of consumers: besides the group of socially concerned consumers, there also exists a group of consumers that does not give any value to the CSR attributes of products. In most studies socially concerned consumers are able to observe firms' efforts on CSR. In Besley and Ghatak (2007), Drydakis and Vlassis (2007), Feddersen and Gilligan (2001), Mitrokostas and Petrakis (2008) and Noe and Rebello (1995), consumers are unable to recognize the CSR efforts of firms.

Almost all studies adopt a vertical differentiation approach: socially concerned consumers consider CSR products as of higher quality and are willing to pay a price premium to buy them. In these cases, consumers are also heterogeneous in their evaluation of CSR: willingness to pay varies across consumers. In Becchetti and Solferino (2003) and Conrad (2005), authors adopt an horizontal differentiation approach; in Becchetti and Solferino (2003),

[10]General equilibrium approach is not usually adopted to model CSR and EC.

[11]The hypothesis of CSR as a firm's differentiation strategy has been recently tested by Siegel and Vitaliano (2007).

[12]Davies (2005) assumes that CSR can either increases or decreases costs of firms.

[13]Consumers gain utility not only from the quantity of good consumed (as an example see Andreoni (1990)).

consumers are uniformly distributed on a linear segment (called the *ethical segment*) and each point of the segment represents a different level of CSR desired by the consumer. When the firm offers a lower level of CSR than that desired by the consumer, consumer's cost to buy the product is positive and increasing in the distance between the points at which the consumer and the firm are located on the ethical segment; when instead the firm offers a higher level of CSR, consumer's cost to buy the product is equal to zero. In Conrad (2005), consumers'costs are different: when either the level of CSR effort desired by the consumer is higher or lower than that offered by the firm, costs are positive and quadratic in the distance between the points at which the consumer and the firm are located on the "ethical" segment (see D'Aspremont et al., 1979). In addition to this cost, in Conrad (2005), consumers also bear a cost due to the bad conscience of not having purchased the product associated to the highest CSR effort (the point at the right extreme of the "ethical" segment).

In all studies but Becchetti and Solferino (2003), firms who commit to CSR are profit-maximizing: firm decides the level of CSR that maximize profits. From this point of view, economics and business sciences share the same interpretation of CSR as a strategic decision which is not in contradiction with the maximization of profits[14] (see McWilliams and Siegel, 2001). Indeed, firms who commit to CSR are both for profit and not for profit.[15] Let us now provide a brief summary of each study.

CSR as Fair-Trade. Becchetti and Solferino (2003) analyze a model in which a not for profit fair-trade firm (FT firm) and a profit-maximizing firm (PM firm) buy a raw commodity from farmers in the South paying them a monopsony unit price. In addition to this price, firms may also choose to transfer to South farmers a certain amount of money per unit of commodity bought. Firms transform raw materials and produce the same final good which is sold to consumers in the North. Firms are differentiated along an ethical segment which is a reinterpretation of the well-known Hotelling line segment in terms of ethical instead of geographical space[16]. At each point of the segment corre-

[14]This view contrast with Friedman (1970)'s opinion on CSR: "in practice the doctrine of social responsibility is frequently a cloak for actions that are justified on other grounds rather than a reason for those actions. To illustrate, it may well 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".

[15]Fair-Trade firms are usually cooperatives whose objective is not the maximization of profits.

[16]As cited above, the main difference between the ethical segment and the Hotelling line relies on the functional form of ethical distance costs of consumers. These are linear (as in the original work of Hotelling, 1929) and asymmetric.

sponds a certain transfer to South farmers. The right extreme of the segment corresponds to the maximum amount of transfers to farmers. Consumers are uniformly distributed along this segment. Differently from the PM firm, the aim of the FT firm is to maximize transfers to South farmers. Authors analyze five different games. In the first game, maximum ethical differentiation between firms is assumed as given (the FT firm is located on the right extreme of the segment while the PM firm is located on the left extreme) and the PM firm chooses its price. In equilibrium, the PM firm chooses a price lower than the monopoly price. The second game is given by the first game plus an additional stage in which the PM firm can optimally choose a new location. In equilibrium, maximum ethical differentiation holds if marginal producer costs of imitation are higher than marginal consumers costs of ethical distance. When condition on costs is not satisfied, the PM firm imitates the FT firm; however distance between the two firms remains strong and there is not minimal ethical differentiation. The third game is identical to the first game with the only difference that the PM firm chooses simultaneously both price and location. When marginal producer costs of imitation are lower than marginal consumers costs of ethical distance, equilibrium is characterized by ethical imitation and minimum price differentiation. The fourth game is a three-stage game; in the first stage, the PM firm chooses its location (it behaves as a Stackelberg leader); in the second stage, the FT firm chooses the location which maximizes transfers to South farmers, and, in the third stage, the PM firm chooses price. Equilibrium is characterized by minimum price differentiation, ethical imitation and non minimal ethical differentiation. The last game is identical to the previous one with the only difference that Stackelberg leader is now the FT firm. In this case, result is identical to equilibrium of the previous game if producer marginal costs of ethical imitation are lower than consumers marginal costs of ethical distance; otherwise, optimal location of the FT firm is relatively less ethical than in the case in which the PM firm is the Stackelberg leader. Also in this last case, there is not minimal ethical differentiation.
Differently from Becchetti and Solferino (2003), Graichen (2008) gives a representation of the fair-trade system analyzing both the market for raw materials and the market for final goods. Author analyzes a model in which two firms in the North, a conventional and a Fair-Trade firm, buy a raw commodity from two large groups of small-scale farmers in the South: a conventional and a fair-trade farmers' group. Production costs of fair-trade farmers are higher than conventional farmers' production costs[17]. Conventional firm uses

[17]The Fair-trade Labeling Organization imposes several productive standards to provide the fair-trade certification mark.

its monopsony power to buy the commodity from conventional farmers at the monopsony price which is lower than the competitive level. Fair-trade firm does not use its monopsony power and the Fair-trade labeling organization (FLO) decides the minimum commodity price fair-trade firm has to pay to the fair-trade farmers. In addition to this price, fair-trade firm has also to pay a labeling fee to the FLO. Firms process the commodity and sell the products to consumers in the North. The model is a two-stage game: in the first stage, firms decide the quantities of the raw commodity to buy and, in the second stage, firms decide prices of products sold in the North. Total welfare is given by the sum of consumers' surplus, farmers' producer surpluses and firms' producer surplus. Welfare is dependent on the minimum fair-trade commodity price set by FLO and there exists a minimum price which maximizes total welfare. Author provides a detailed welfare analysis[18] changing three parameters: the labeling fee, the additional fair-trade farmers' production costs and the warm-glow giving of consumers (see Andreoni, 1990). An increase of the warm glow of giving and a decrease of the additional fair-trade farmers' production costs is in the interest of all actors of the economy while no unambiguous answer can be given for the labeling fee.

CSR and labor market. Davies (2005) analyzes a model in which firms can produce their brand using either adult or child labor. Consumers prefer adult labor firm's products. Firms compete over prices and label their products to differentiate on CSR. In a standard vertical differentiation model, author shows that the necessary condition to eliminate the use of child labor is that the adult-labor cost is no more than child labor cost. The robustness of this result is also tested in a more complicated model where products are differentiated along the additional dimension of brand loyalty.
Differently from Davies (2005), Drydakis and Vlassis (2007) assume a different and more detailed labor market: workers are equally skilled but are heterogeneous in their reservation wages. There exists two groups of workers, a high and a low reservation wage's group of workers. This difference is explained with the presence of a group of workers (migrants as well as aged and long term unemployed workers) that faces lower opportunity costs of employment than costs of "regular" workers. Each firm conducts a bargain with its trade union to decide wages of employees. Two options can realize: discrimination in wages and non-discrimination in wages across the two types of employees. Consumers give a positive value to the non-discriminatory option

[18] Author distinguishes between short and long run effects. In the short run, the share of fair-trade farmers is considered fixed, while, in the long run, the number of fair-trade farmers increases (decreases) if fair-trade farmers' producers surplus is higher (lower) than conventional farmers' producers' surplus.

but in order to make this option visible, firms should spend an advertisement fixed cost. The model is a four-stage duopoly game. In the first stage, in case of discrimination in wages, a policy maker decides the policy instrument to induce firms and unions to non-discriminate in wages; in the second stage, bargains between firms and unions determine wages of employees; in the third stage, firms decide the level of CSR advertisement, which is equal to zero if the option of discrimination in wages realizes; in the last stage, firms compete over quantities. There are two different equilibrium configurations. When consumers' valuation of non-discrimination is relatively high, non-discrimination in wages realizes without the intervention of the policy maker: both unions set non-discriminatory wages and firms optimally advertise non-discrimination in wages as their CSR activities. Otherwise, discrimination in wages is contrasted by the policy maker which induces the non-discriminatory option bearing the CSR advertisement costs of firms. In this last case, policy maker's action entails a net loss in social welfare.

CSR as a credence good. Noe and Rebello (1995) analyze competition between two groups of producers. Each producer can choose between two production technologies, an ethical and a standard technology. The adoption of the ethical technology implies higher variable costs. Producers act as price takers. Consumers can identify the group the producer belongs to, but cannot distinguish between technologies adopted by producers in the same group. Consumers prefer the ethical technology and form rational expectations regarding the average level of usage of the ethical technology within each group. This implies that the market price for the output of a group, is an increasing function of the level of adherence to the ethical technology within the group and a decreasing function of the aggregate output of both groups. Authors analyze the dynamics of competition between the two groups assuming that the rate of growth of each group is proportional to the overall level of profitability experienced by group members. Results indicate that competition between producers groups leads to the market dominance by the group with a greater long-run commitment to the employment (adherence) of the ethical technology. If instead producer commitment is weak, consumer preferences (over ethical technology) cannot be satisfied in the long run. However, even in this case, competition between producer groups can increase the adoption of the ethical technology for an arbitrarily long period of time.
In Feddersen and Gilligan (2001), authors analyze a model in which two firms compete over qualities. Consumers prefer *good* quality products but are unable to recognize the quality offered by firms. An activist can signal quality choices of firms to consumers. The aim of this paper is to explore the effects of an information-supplying activist on market results. The model

is a four-stage duopoly game of incomplete information. In the first stage, firms choose to produce either good or bad quality products. Good products are more expensive and quality costs are fixed. In the second stage, nature selects one of the two firms to be monitored by the activist. The activist learns what quality the monitored firm has chosen. In the third stage, the activists choose a message given the quality observed. In the last stage, the consumer observes which firm has been monitored, the activist's signal and form beliefs over the quality chosen by firms. Authors analyze the sequential equilibria of this game and results are compared with a benchmark case in which activist is not operating in the economy. In the benchmark case, at equilibrium, each firm chooses the bad quality with unit probability. In the four-stage game instead, authors show that an activist can induce three different sequential equilibria: 1) the two firms choose good quality products with a positive probability[19], 2) one firm chooses good quality while the other firm chooses bad quality with unit probability[20], and 3) both firms supply the good product with a probability approaching to one as the goods produced by the two firms become closer substitutes[21].
Differently from Feddersen and Gilligan (2001), in Mitrokostas and Petrakis (2008) authors analyze the case in which consumers' information about the CSR commitments of firms, otherwise unobservable, is revealed through certification. Authors consider a three-stage duopoly game. In the first stage, a certifier chooses the standard of CSR effort to provide the certification; in the second stage, firms observe the CSR effort necessary to obtain a socially responsible certification and decide their commitments to CSR; in the last stage, firms compete over quantities. Authors investigate both the case in which certification is provided by a private certifier and the case in which certification is provided by the regulator. Both scenarios are compared with a benchmark case in which no certification is provided and no firm engages in CSR[22]. In equilibrium, in both scenarios, the two firms engage in CSR and

[19]A firm chooses good quality with positive probability only if five properties are satisfied: 1) firm is monitored with sufficiently high probability, 2) the activist send the good quality signal with higher probability when the firm chooses good quality than when it chooses bad quality, 3) consumers respond to the activist's signal, 4) there is an upper bound on the probability that the other firm produces the good product, and finally 5) the products of the two firms are sufficiently close substitutes.

[20]This result is obtained when the products of the two firms are sufficiently close substitutes.

[21]This result is obtained only if cost saving from supplying the bad product is not too large. In a different set-up Alves and Santos-Pinto (2008) show exactly the opposite results: when the degree of product substitutability is high, firms prefer not to commit to CSR, i.e. both firms offer bad quality products.

[22]It is not convenient for firms to engage in a costly CSR strategy if consumers cannot

consumers' surplus and total welfare increase comparing to the benchmark case. The levels of CSR effort imposed by the certifier, consumers' surplus and total welfare are highest in the regulator's scenario[23].
Besley and Ghatak (2007) differ from all the other contributions of this subsection since it makes a distinction between what firms communicate on CSR and what firms really do on CSR: firms who engage in CSR advertise their activities to consumers but information provided through adverting can be different from the true firm's CSR commitment. CSR advertising of firms is then considered as a credence good since consumers cannot recognize if firm delivers the promised level of CSR. We illustrate this paper in what follows since it deals with CSR as the provision of a public good.

CSR as the provision of a public good. Bagnoli and Watts (2003) analyze a model in which CSR is offered by firms through the provision of a public good. Firms can decide to offer either a private good or a private good linked to a public good. Consumers positively value the private good linked to the public good. Two different cases are analyzed: the case in which the amount of the public good is explicitly linked to the amount of private good sold by firms (e.g. Cause-Related Marketing) and the case in which there is not direct link between the amounts of public and private goods offered by firms (e.g. Corporate Philanthropy). In the first case, higher variable production costs are associated to the production of the linked product, while, in the second case, the production of the linked product implies higher fixed costs. Both cases are analyzed assuming two different market structures: Bertrand and Cournot competition. The model is a two-stage game; in the first stage, firms compete by choosing which version of the product to sell and, in the second stage, firms choose what price (quantity) to charge. When there is an explicit link between the amounts of public and private goods offered by firms, results indicate that less than the pareto-efficient amount of public good (i.e. the first-best level of provision of public good[24]) is provided in

distinguish between CSR and not CSR firms

[23]This difference in results is due to the different objective functions maximized by the private certifier and the regulator. In the first scenario, the private certifier chooses the CSR effort that maximizes its profit which is equal to the fee paid by firms to obtain the certification. This fee is given by the difference between the gross firm's profit from engaging in CSR before the payment of the fee and firm's profit in the benchmark case. In the second scenario, besides the costs of CSR, to obtain the certification firms have also to pay a fixed cost of monitoring to the regulator and regulator sets the CSR effort that maximizes total welfare (given by the sum of consumers' surplus, profits of firms and monitoring costs).

[24]The first best-level of provision public good is obtained by applying the standard Lyindahl-Samuelson rule for optimal provision of public goods.

most cases. In particular, too little of the public good is provided when there are a large number of firms. However, there also exists equilibria in which the amount of the public good provided by firms either equals or exceeds the efficient amount. In a Betrand game, this last case arises when there are exactly three firms in the market, while, in the Cournot game, this case arises for a wider range of numbers of firms and parameter values. Under some conditions[25], authors also show that the amount of the public good provided under Cournot competition exceeds the amount provided under Betrand competition. When the amounts of public and private goods offered by firms are not explicitly linked, authors obtain similar results.
Besley and Ghatak (2007) analyze feasibility and desirability of CSR. Firms[26] who commit to CSR offer a private good linked with a certain amount of a public good. There are two types of consumers: caring and neutral consumers. Caring consumers positively value private good linked to the public good. In the first basic model, consumers can perfectly monitor whether firms deliver the promised level of the public good. Firms move first announcing their commitments on CSR (the level of public good produced) and prices; then consumers decide which firm to purchase from. In equilibrium, neutral and caring firms coexists in the same market; neutral firms serve neutral consumers, produce a private good priced equal to marginal cost and do not produce any of the public good; caring firms serve caring consumers, contribute to the public good and charge a higher price for the linked private good. The level of the public good provided is below the first-best level of provision and is the same as if the caring consumers were making private voluntary contributions to the public good. Hence, the case for CSR rest on the inability of government to provide the first-best level of public good. In the second model, authors assume that consumers cannot perfectly monitor whether firms deliver the promised level of the public good. There is an infinite horizon and, in each period, the firm can either provide the promised level of public good or cheat. There is a monitoring technology which catches a cheating firm with a given probability. Firm caught cheating is punished for ever and can produce only for neutral consumers for which no reputation is needed. In equilibrium, the optimal level of provision of public good is lower than the case of perfect monitoring and marginal cost of proving the public good is higher. As the probability of monitoring and the discount factor goes to zero, no CSR is sustainable. Afterwards authors analyze the desirability of CSR by comparing it to alternative institutional arrangements for provision

[25]These conditions ensure that the price of the non linked product is high relative to the price of the linked version, which allows for relatively more of the linked version to be sold and thus more of the public good provided by firms.

[26]the number of firms is assumed to be greater than three.

of public goods. The first case analyzed is that in which government cannot directly provides the public good since its provision is intrinsically bundled with the firm's production process. Government decides to adopt a uniform regulation affecting all firms. In this case, only a large level of regulation can achieve the first-best level of public good in equilibrium. However, this level is satisfied only if neutral consumers are willing to buy the good at the higher price needed to finance the first-best level of public good. The second case analyzed is that in which government can directly provide the public good using a uniform head tax. Government is not a benevolent social planner in the sense that it picks the policy preferred by a majority of citizens. In this case, outcome depends on the fraction of the two groups of consumers. If the neutral consumers are in a majority, government does not offer any level of public good and the case of CSR offered by firms generates a Pareto improvement. If the caring consumers are in a majority, government provides a level of public good which exceeds the first-best level. In the third case, politicians picks the policy preferred by a majority of citizens but can cheat and consume tax revenues raised for producing public goods. Citizens cannot perfectly monitor opportunistic behavior of politicians. With a given probability politician is monitored and if he is caught cheating then he is removed from office. In this case, results are identical to the previous case if monitoring of government is sufficiently good; if instead probability of monitoring is low then CSR dominates government provision.

CSR and product differentiation. Alves and Santos-Pinto (2008) analyze CSR in imperfectly competitive markets. The model is a two-stage duopoly game; in the first stage, firms decide the amount of money to give to social causes per unit sold; in the second stage, firms compete over quantities. Consumers positively value the CSR commitments of firms. Products are differentiated and CSR is an additional dimension of differentiation. Results indicate that a necessary condition for firms to engage in CSR is that consumers' maximum willingness to pay for a firm's social behavior must be higher than the marginal cost of increasing CSR to the firm. This condition is also sufficient when good are complements. When instead the degree of product substitutability is high, firms prefer not to commit to CSR. The model also show how equilibrium contribution to social causes depend on firms' costs and on the degree of product differentiation; if consumers' maximum marginal willingness to pay for social behavior of firms is not excessively high and goods are complements, then firms' contributions to social causes are increasing with the cost of production and the degree of product differentiation.

CSR and socially responsible managers. Manasakis et al. (2007) consider a

model in which each firm has a owner and owners can decide either to hire or not a socially responsible manager (hereafter SRM). SRMs derive utility not only from the firm's profits but also from its own CSR activities within the firm. Authors analyze a three-stage duopoly game; in the first stage, both firms' owners decide whether they hire a SRM; in the affirmative case, owners also decide the specific type of SRM. Different types of SRM identify different managers' propensity to CSR activities. In the second stage, managers decide on the level of the firms' CSR activities. In case an owner has decided not to hire a SRM, no CSR activities are undertaken. In the third stage, SRMs (or owners) compete over quantities. At equilibrium, both owners decide to hire a SRM since this is the dominant strategy. By comparing this equilibrium with the benchmark case in which no firms' owner hires a SRM, authors find that output, prices, profits and total welfare is higher when firms' owners hire SRMs.

CSR and socially responsible consumers. Garcìa-Gallego and Georgantzìs (2009) consider a two-stage game in which firms first choose their level of social responsibility and then prices. Three different market structures are analyzed: a monopoly of a socially responsible firm whose sales cover the whole market (complete coverage monopoly), a duopoly of two socially responsible firms whose sale cover only a part of the market (incomplete coverage duopoly), and a duopoly of two responsible firms whose sales cover the whole market (complete coverage duopoly). At equilibrium, firms' profits, prices, CSR commitments of firms and social welfare are functions dependent of consumers' willingness to pay (WTP) for products sold by CSR firms. Authors analyze the effects of increases in WTP under a fixed market structure and across different market structures (as consumers' WTP increases market structure remain unchanged until a given value of WTP in correspondence of which market shifts from one structure to another). Under a fixed market structure, an increase in WTP is beneficial for both firms and society in both the incomplete coverage duopoly and complete coverage monopoly cases; in the incomplete coverage duopoly case, increases in consumers' WTP harm the firm with the lowest level of CSR commitments, whereas they increase the profit of firm with the highest level of CSR commitments and social welfare. Across different market structures, as consumers' WTP increases and market shifts from incomplete to complete duopoly market structure, social welfare function jumps to a lower level while firms' profits functions do not jump and increase. Hence, the main message of this analysis is that increasing the consumers' WTP is not monotonically beneficial, neither to society nor to socially responsible firms.

CSR and the environment. Arora and Gangopadhyay (1995) explain why firms may voluntarily overcomply with environmental regulation. Authors analyze a two-stage duopoly game in which firms first choose their levels of cleaning technology and next engage in price competition. A cleaner technology implies higher fixed costs. All consumers positively value the cleaner technology but have different incomes; consumers with different incomes have different abilities to pay for the the cleaner technologies. Products only differ in the way they are produced. In equilibrium, both firms obtain positive profits; each firm adopts a positive and different level of cleaning technology; market is segmented by income levels: richest consumers buy the product from the highest cleaning technology firm while poorest consumers buy products from the lowest cleaning technology firm. The adoption of identical cleaning technology is a dominated strategy since it led to zero profits for both firms. The levels of cleaning technology of both firms increase if either the income of each group increases by the same amount or the lowest income group increases its income. Afterwards, authors study what are the effects of different government policies. If government imposes a minimum standard of cleaning which is not too high (but greater than the equilibrium level of the lowest cleaning technology firm), then the lowest cleaning technology firm meet the standard while the highest cleaning technology firm overmeet the standard, and the proportion of consumers buying the product increases. The same results are obtained when government subsidizes firms while an opposite result is obtained with taxation on the output of firms.
Differently from Arora and Gangopadhyay (1995), Conrad (2005) adopts an horizontal differentiation approach[27]: firms are differentiated along a segment which represent different levels of environmental quality of products. The right extreme of the segment indicates the most environmentally friendly product. At higher levels of environmental qualities correspond higher variable production costs. Consumers are uniformly distributed along this segment and each of them buys one unit of the product. Consumers' costs are positive and quadratic in the distance between the points at which consumer and firm are located on the segment (see D'Aspremont et al., 1979). In addition to this cost, consumers also bear a cost due to the "bad conscience" of not having purchased the most environmentally friendly product. The model is a two-stage duopoly game; in the first stage, firms choose locations (environmental quality of product); in the second stage, firms compete over prices. There are several equilibrium configurations which depend on the difference between environmental concern of consumers (the bad conscience parameter) and marginal cost of production. Under strong environmental

[27] Also Becchetti and Solferino (2003) adopt an horizontal differentiation approach

concern (when the bad conscience of not having purchased the most environmentally friendly product is much stronger than unit cost of production) there is Bertrand price competition: both firms produces the most environmentally friendly product, prices are equal to marginal cost of production and profits are equal to zero. As environmental concern becomes weaker one of the two firms offer a less environmentally friendly product until the maximal product differentiation result is reached: one of the two firms produces the less environmentally friendly product and its rival offers the most friendly product (this configuration is called the balanced environmental/cost situation). Under weak environmental concern (when costs strongly dominate environmental concern), there is still Bertrand price competition: both firms produces the less environmentally friendly product, prices and profits are equal to zero. Afterwards, author finds that the social optimum quality chosen by an environmental authority is not the same as the one chosen by private firms in equilibrium. However, in some cases, authority can choose policy instruments to induce firms to produce the social optimum environmental quality of products.
Amacher et al. (2004) examines eco-labeling within a three-stage game. Eco-labeling systems imply that any firm, to obtain the eco-label, is forced to make investments in green technologies. These investments are costly and increase fixed costs. Authors extend the usual duopoly model of vertical differentiation with variable cost by including an initial technology stage in which firms choose whether and how much to invest in the green technology. In the second stage firms choose level of environmental quality of products and, in the last stage, firms choose prices. Equilibrium results depend on the difference between fixed costs of high and low-quality firms. When fixed cost of the low-quality firm is higher (lower) than the high-quality firm's fixed cost, then: 1) the quality levels will be lower (higher) for both firms than the case in which firms have the same fixed investment cost (however the difference in qualities offered by the two firms is always the same), 2) the high (low) quality firm always has a positive technology investment while the low (high) quality firm invests only if fixed cost is not too elevate, 3) the difference between equilibrium prices of the high and the low-quality firm is smaller (higher) than the case in which firms have the same fixed investment cost. When firms have the same fixed cost, then both firms invest in technology. When the high-quality firm is more efficient at investing, the high-quality firm perform better in price competition and it does not need to produce very high quality in order to mitigate price competition with the low-quality firm. If instead the low-quality firm is more efficient at investing, then the high-quality firm is less efficient and it therefore provides higher quality to mitigate price competition. Market outcomes are compared to qualities and

investment levels which maximize social welfare. Social optimum levels of investments are always positive and lower than positive profit-maximizing investments of firms: profit-maximizing firms will likely invest too much in the green technology. The government can decrease this excess of investment and increase the provision of environmental quality by introducing an eco-labeling fee that raise unit cost of investment. The last part of the paper analyzes the case in which a positive environmental externality is introduced in the model: consumer utility is increasing in average quality. In this case, results indicate that the possibility of overprovision of environmental quality by a duopoly decreases and that of underprovision increases.
Rodrìguez-Ibeas (2007) considers a duopolistic model of environmental product differentiation. There are two firms, the "green" and the "brown" firm. The "green" firm does not generate any polluting emission while the "brown" firm generate one unit of polluting emission per unit of output. The level of polluting emissions is then given by the output of the brown firm. There are two types of consumers, "green" and "brown". "Green" consumers are willing to pay a higher price to buy the good produced by the green firm (willingness to pay vary across green consumers). "Brown" consumers do not care about the environment and buy from the lowest price firm (the brown firm). Green firm's cost of production is higher than brown firm's cost. Firms compete over prices. Author focuses on the situation in which the marginal cost of producing the green product is relatively large. In equilibrium, the green firm charges a higher price and only sells to green consumers. The brown firm sells to both green and brown consumers. Authors are interested in analyzing the welfare and environmental effects when the population of green consumers increases. As green consumers increase both equilibrium prices decreases and aggregate sales increase. However the effects on the environment depend on the level of polluting emission: as green consumers increases brown firm's equilibrium output (polluting emissions) may either increases or decreases depending on the degree of product differentiation and green firm's cost of production. In particular, when the proportion of green consumers is low, both firms compete for very few consumers, product differentiation becomes less important and the advantage in costs makes the brown firm charge a low price and capture almost the whole market; a marginal increases in the population of green consumers make firms compete more vigorously but still the cost advantage benefits the brown firm which increases its output and hence polluting emissions (although the green firm sells more). Once a critical value of green consumers is reached, further increases in the population of green consumers reduce the brown firm's output (the level of polluting emissions) as product differentiation becomes more important. Afterwards, authors analyze the effect of an increase in the population of green consumers

on social welfare. Social welfare is given by the sum of consumer surplus and aggregate profits minus the social damage of environmental pollution; social damage is equal to the social marginal damage of one unit of pollution times the brown firm's equilibrium output. As green consumers increase the sum of consumer surplus and aggregate profits increase but the social damage can either increases or decreases; hence the effect of an increase in the population of green consumers on social welfare depends on which effects dominate.

Each of these contributions analyzes a different aspect of CSR but, amongst these, only few works assume that CSR is a credence good and, in particular, only Besley and Ghatak (2007) assume that consumers can not recognize if firm delivers the promised level of CSR. Indeed this characteristic of CSR is relevant to link recent contributions on CSR to the debate undertaken by Friedman (1970) and Arrow (1973). In what follows we illustrate some arguments in favor of the assumption that CSR is a credence good and we explain in which way such assumption can be linked to the thesis of the two economists.

1.4 CSR as a credence good

In Section 1.2.2, we showed that the majority of consumers have a positive predisposition towards the CSR activities of firms (see, as an example, MORI, 2000); however, other studies show that the CSR market is a small proportion of the total annual household consumer spending (see, for instance, The Co-operative Bank, 2007; Tallontire et al., 2001). Hence there appears to be a divergence between attitudes of consumers and the volume of sales of ethical products. Not all the consumers who declare to be socially (or environmentally) concerned purchase ethical products. Indeed several factors may explain such divergence. Page and Fearn (2005) claim that: "seventy percent of consumers in the United Kingdom, 64 percent in the United States and 65 percent in Japan claim not to think about corporate responsibility while they are shopping, or claim that the price and the quality of products are much more important to them than any corporate reputation issues". Mohr et al. (2001) interpret this divergence as a "social desirability response bias": when answering questions about CSR, consumers may want to appear concerned even if they are not. Another possible explanation is linked to the fact that CSR commodities are usually more expensive than traditional ones (see for instance Starr, 2009): several studies show that consumers that purchase CSR commodities usually have a medium-high level of income (see for instance Livraghi, 2007a; D'Alessio et al., 2007a) implying

that only "rich" ethical consumers can afford CSR commodities[28]. These interpretations however take into account only the consumers' side of the market and do not explain the aforementioned divergence as a phenomenon also caused by a characteristic of CSR. Nowadays we assist to an oversupply of CSR advertising and experiences such as Fair-Trade coexists with others which are very different in their nature such as CRM and CP[29]; on the other side, consumers do not have information about the social, ethical and environmental performance of brands, and even when this information exists, it is costly to retrieve it and process it (see Valor, 2009). Moreover credibility of CSR is often criticized by activists' groups such as Christian Aid (2004) and Corporate Watch (2006): "The idea of ethical consumption [...] pre-supposes that consumers have access to unbiased information, but with millions spent by companies on advertising, much of the available information is heavily biased. The principal purpose of advertising is to make the product seem more ethical than it really is. Since few consumers closely scrutinize a company's ethical claims, companies are able to get away with misleading messages" (see Corporate Watch, 2006). Christian Aid (2004) analyzes three case studies on three big multinational companies (Shell, British American Tobacco and Coca-Cola) and show how company's announcements on CSR have not been fulfilled: "Shell claims that it has turned over a new leaf in Nigeria and strives to be a good neighbour. Yet it still fails to quickly clean up oil spills that ruin villages and runs community development projects that are frequently ineffective [...]. British American Tobacco stresses the importance of upholding high standards of health and safety among those working for it, and claims to provide local farmers with the necessary training and protective clothing. But contract farmers in Kenya and Brazil say this does not happen and report chronic ill-health related to tobacco cultivation. Coca-Cola emphasizes using natural resources responsibly. Yet a wholly owned subsidiary in India is accused of depleting village wells in an area where water is notoriously scarce." (see Christian Aid, 2004).

As a result, we may conclude that CSR is a credence good whose quality cannot be evaluated even after consumption: consumers cannot distinguish between the advertised level of CSR and its real content[30]. This is probably

[28]We investigate the role of income distribution in the diffusion of CSR in Chapter 3.

[29]Fair-Trade is an alternative system of trade in which the objective of fair-trade producers is not the maximization of profits in itself but indeed the maximization of transfers to farmers in the South. Contrarily CRM and CP are perfectly coherent with the maximization of profits and it is not a case that firms which usually undertake CRM and CP actions are big multinational companies.

[30]McWilliams and Siegel (2001) define CSR as "actions that *appear* to further some social good, beyond the interests of the firm and that which is required by law". The term

the reason why many potentially socially concerned consumers prefer not to buy ethical products (see Page and Fearn, 2005) and socially concerned consumers find it difficult and costly to distinguish between the different CSR actions offered by firms: Gadotti and Mortara (2007) show that socially concerned consumers who buy Fair-Trade products also buy CRM products.

At the moment, there is not any empirical analysis which analyzes and justifies the divergence between positive attitudes of consumers towards CSR and sales of ethical products, and much effort should be given to understand whether our hypothesis may explain such divergence. However, whatever are the factors that better explain such divergence, the assumption of CSR as a credence good is, in our opinion, relevant in spite of the debate undertaken by Friedman (1970) and Arrow (1973): CSR can survive and develop only if it is credible to the eyes of consumers and credibility of CSR can be guaranteed only if it is embodied in some definite and widely accepted social institution (see Arrow, 1973). Hence, from this point of view, the opinion of the two economists (see Section 1.3.1) takes new relevance: "After all, an ethical code, however much it may be in the interest of all, is [...] not in the interest of any one firm. The code may be of value to the running of the system as a whole, it may be of value to all firms if all firms maintain it, and yet it will be to the advantage of any one firm to cheat - in fact the more so, the more other firms are sticking to it. But there are some reasons for thinking that ethical codes can develop and be stable. These codes will not develop completely without institutional support. That is to say, there will be need for focal organizations, such as government agencies, trade associations, and consumer defense groups, or all combined to make the codes explicit, to iterate their doctrine, and to make their presence felt." (see Arrow, 1973).

1.5 Concluding remarks

In this chapter we studied how corporate social responsibility and ethical consumption enter the economics analysis. Research into CSR is traced back to an important question in the political and economic debate: do firms have any kind of social responsibility beyond the maximization of profits? The answer to this question by both Friedman (1970) and Arrow (1973) is that the role of firms is to maximize profits as long as it stays within the rules embodied in law and in ethical custom, while the role of institutions is to establish the rules to prevent or repair the socially inefficient outcomes due to the maximization of profits. Hence, Friedman (1970) and Arrow (1973)

"appear" clarifies the distinction between what firms communicate on and what firms really do on CSR.

accept CSR only if it is embodied in some definite and widely accepted social institution. Whatever the opinion of the two economists, CSR has evolved as a strategy adopted by firms to differentiate their products: firms commit to CSR in order to satisfy the demand for CSR from consumers. Recent contributions on CSR go beyond the debate on whether firms should undertake a CSR action and include CSR differentiation strategies of firms and social preferences of consumers in traditional economics models. These models are usually two-stage games in which firms first choose their commitments to CSR and then choose either prices or quantities. In equilibrium firms positively commit to CSR depending on both the cost of CSR and preferences of consumers. Welfare may either increases or decreases depending on the specific framework adopted. Each contribution analyzes a different aspect of CSR but, amongst these, only few works assume that CSR is a credence good. However, this characteristic of CSR could be relevant in spite of the debate undertaken by Friedman (1970) and Arrow (1973): the CSR sector may survive and develop only if it credible and this, in turn, can be guaranteed when CSR is embodied in a definite and widely accepted social institution. If CSR can be really considered as a credence good, literature on CSR should dedicate much effort to test both theoretically and empirically which are the best social institutions to make CSR credible to the eyes of consumers.

Chapter 2

The Role of Socially Concerned Consumers in the Diffusion of Corporate Social Responsibility

Abstract

The purpose of this chapter is to investigate how the size of socially concerned consumers' group affects firms' decisions to commit to social responsibility. We assume that a share of consumers are *socially concerned* in the sense that they desire to have a market in which firms commit to CSR, in a framework where the goods produced by firms are considered entirely homogeneous by both traditional and socially concerned consumers' group. We made this assumption to interpret the stylized divergence between positive attitudes of consumers towards CSR and sales of CSR firms' products. We find that either a large group of socially concerned consumers or a low cost of social responsibility induces an equilibrium outcome in which firms who commit to CSR coexists with firms which do not invest in social responsibility. Otherwise, firms do not commit to CSR.

2.1 Introduction

Corporate social responsibility (CSR) is defined as "[a] concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis" (see Green Paper, 2001). One of the most famous example of CSR is Fair-Trade. Fair-Trade is an alternative approach to conventional trade: producers in over fifty countries respects several standards set by FLO International

(Fairtrade Labelling Organizations International) such as guaranteeing decent wages to workers, ensuring health and safety standards and providing adequate housing where relevant. In many markets, firms who commit to CSR – *ethical firms* – coexists with firms which do not integrate any social concern in their business operations – *standard firms*.

On the consumers' side, many surveys and opinion polls show a predisposition of consumers to the CSR activities of firms (see Environics International, 1999; MORI, 2000; The Co-operative Bank, 2007). For instance, in MORI (2000), a study devoted to social responsibility conducted across twelve European countries, "70% of European consumers say that a company's commitment to social responsibility is important when buying a product or service". However there appears to be a divergence between these surveys and the volume of sales of ethical products: even if there has been a substantial increase in investment in CSR activities in all OECD nations (see Paton and Siegel, 2005), CSR market is still a small proportion of the total annual household consumer spending (see, for instance, The Co-operative Bank, 2007; Tallontire et al., 2001). Indeed not all the consumers who declare to be socially concerned purchase CSR firms' products. We interpret such divergence assuming that a share of consumers are socially concerned in the sense that they desire to have a market in which firms commit to CSR, in a framework where the goods produced by firms are considered entirely homogeneous by all the consumers.

Research into CSR can be traced back to an important question in the political and economic debate: do firms have any kind of social responsibility beyond the maximization of profits? This question is at the core of two articles written in the 70's by Friedman (1970) and Arrow (1973). The answer of the two economists converge: both claims that the role of firms is to maximize profits so long as it stays within the rules embodied in law and in ethical custom, while the role of institutions is to establish the rules to prevent or repair the socially inefficient outcomes due to the maximization of profits[1]. Whatever the opinion of the two economists, recent contributions in economics go beyond this debate and include CSR activities of firms and social preferences of consumers in partial equilibrium models[2] (see, amongst others, Arora and Gangopadhyay, 1995; Amacher et al., 2004; Alves and Santos-Pinto, 2008; Becchetti and Solferino, 2003; Conrad, 2005; Davies, 2005; Mitrokostas and Petrakis, 2008). Most of these contributions are similar in their structure to traditional product differentiation models where firms offer different qualities of products at different segments of the market (see, for instance, Motta,

[1] See also Kitzmueller (2008).

[2] In Chapter 1 we present a detailed analysis of this literature.

1993; J. Tirole, 1988). The majority of these contributions are two-stage duopoly games in which firms first decide their commitments to CSR and then compete over prices (or quantities). Commitments to CSR are costly and at increasing levels of CSR are associated higher production costs. In equilibrium, firms are able to separate the market and obtain different demand functions: the firm with the highest commitment to CSR serves the most socially concerned consumers while the firm with the lowest commitment to CSR serves the less concerned consumers, each firm obtaining positive market demands and profits. On the consumers' side, most of these contributions assume that the *entire* population of consumers are socially (or environmentally) concerned in the sense that they are willing to pay a price premium for buying ethical firms' products. Only Besley and Ghatak (2007) and Rodrìguez-Ibeas (2007) assume two types of consumers: socially concerned and traditional consumers[3]. The group of traditional consumers does not give any value to the CSR attributes of products. The basic model analyzed by Besley and Ghatak (2007) is a vertical product differentiation model in which firms may choose either to offer or not a certain amount of public good linked to the identical private goods produced by firms. The number of firms is greater than three and firms compete à la Bertrand. Consumers can recognize which are the firms delivering the public good. In equilibrium, the existence of the two groups of consumers induce firms to separate the market: the share of firms producing the public good serves socially concerned consumers while the remaining firms do not produce any public good and serve traditional consumers. Besley and Ghatak (2007) are particularly interested in comparing their results on CSR to both the standard voluntary contribution equilibrium for public goods and other specific cases such as government and charitable provision of public good. Rodrìguez-Ibeas (2007) analyzes a vertical product differentiation model in which the two operating firms are environmentally differentiated: one of the two firms uses a clean production technology while its rival uses a production technology that generates a unit of polluting emission per unit of output. The model is a one stage game in which firms compete over prices. Author analyzes the welfare and environmental effects (how the units of polluting emissions vary) when the population of socially concerned consumers increases. Hence, both Besley and Ghatak (2007) and Rodrìguez-Ibeas (2007) do not analyze how the specific sizes of the two groups of consumers affect firms' decision to commit to CSR.[4]

[3]In Besley and Ghatak (2007) and Rodrìguez-Ibeas (2007) "traditional" consumers are respectively called "neutral" and "brown" consumers while "socially concerned" consumers are respectively called "green" and "caring" consumers.

[4]In Besley and Ghatak (2007) the sizes of the two groups of consumers do not affect

The purpose of this chapter is to investigate how the size of socially concerned consumers' group affects firms' decisions to commit to social responsibility. As in Besley and Ghatak (2007) and Rodrìguez-Ibeas (2007), we assume that there are two types of consumers: socially concerned and traditional consumers. However we assume that socially concerned consumers have a strict preference for a market in which CSR is offered (by at least one firm), in a framework where the goods produced by firms are considered entirely homogeneous by the two groups of consumers. This assumption is made to interpret the stylized divergence between positive attitudes of consumers towards CSR and sales of CSR firms' products. We analyze a two-stage duopoly game in which firms first decide either to invest or not in CSR and then compete over quantities (a là Cournot). The ethical firm bears a higher variable cost than standard firm[5]. We solve the game backwards and we find that when either the group of socially concerned consumers is large or the cost of CSR is low, there exists two asymmetric Nash Equilibria in pure strategies: one of the two firms commits to CSR while its rival does not and each firm obtains positive equilibrium profits. Under these conditions, there also exists a symmetric Nash Equilibrium in mixed strategies in which firms commit to CSR with positive and identical probabilities. Otherwise, there exists a symmetric Nash Equilibrium in pure strategies in which the two firms do not invest in CSR. The case in which both the firms commit to CSR is never an equilibrium outcome since it is a dominated strategy.

A central question of this chapter is also to study under which conditions this equilibrium outcome is robust to evolutionary pressures. In order to investigate this issue, we present a simple evolutionary model in which the economy is composed by a single large population of firms. Population of firms is divided into two groups: the group of ethical firms and the group of standard firms. Firms are pairwise randomly matched and payoffs gained by firms in each possible match are given by the equilibrium profits obtained by firms in the second stage of the two-stage game.[6] We look for an evolu-

equilibrium results while, in Rodrìguez-Ibeas (2007), firms can not choose if investing or not in CSR (firms do not choose the production technology) and hence the the author can not analyze how investments on CSR vary depending on the sizes of the two groups of consumers.

[5]We assume a higher variable cost for the ethical firm since a positive commitment to CSR represents the respect of an ethical code of conduct that the firm decides to adopt in the production of goods: as an example, we may think to the adoption of an environmentally friendly production system or to the respect of a minimum wage for workers.

[6]There are four possible matches: two cases in which only one of the two firms is ethical, the case in which both firms are ethical and, finally, the case in which both firms are standard.

tionary stable population state (an Evolutionary Stable Strategy, ESS) and we find that, when either the group of socially concerned consumers is large enough or cost of CSR is low, the unique ESS of the model corresponds to the unique symmetric mixed-strategy equilibrium of the two-stage game. This implies that equilibrium mixed strategies of the two-stage game represents the evolutionary stable population state of our model, where the probability to commit to CSR represents the stable population share of ethical firms. Hence, at the ESS, ethical and standard firms coexists and market cannot be entirely composed of either ethical or standard firms. The same result is obtained in a dynamic framework (using the Replicator Dynamics): the unique symmetric mixed-strategy equilibrium of the two-stage game represents the unique asymptotically stable population state. When either the cost of CSR is high or socially concerned consumers group is of a small size, results are different: at the ESS market is entirely composed of standard firms.

We conclude our analysis studying two kinds of policies: a policy that increases the number of socially concerned consumers and a policy that reduces the cost of CSR. We investigate the effects of these two policies on the stable population shares of firms. Intuitively we find that either an increase in the number of socially concerned consumers or a reduction of the cost of CSR induces an expansion of ethical firms in the economy. However only the policy which reduces cost of CSR is able to induce the economy to be entirely composed of ethical firms.

The next section introduces the two-stage game and its equilibria. In Section 2.3 we present the evolutionary model and results. In Section 2.4 we investigate the two policies. Section 2.5 concludes the chapter.

2.2 The Two-Stage Game

In this Section we describe the two-stage duopoly game played by firms.

2.2.1 Consumers' Preferences

We assume that there are two types of consumers, socially concerned and traditional. The share of socially concerned consumers is denoted by $\beta \in [0, 1]$, while the share of traditional consumers is $1 - \beta$. Both types of consumers have the same taste parameter $v > 0$ and quasi-linear quadratic preferences. The utility of socially concerned consumers (SCC) is:

$$u = (v + \theta)q - \frac{q^2}{2} + m, \tag{2.1}$$

where q is the quantity, m is the amount of money spent on all other goods and θ is the term which increments utility of SCC when at least one firm commits to CSR; hence, $\theta = 0$ if no firm commits to CSR and $\theta > 0$ if at least one firm in the market invests in social responsibility[7]. The utility of traditional consumers is given by:

$$u = vq - \frac{q^2}{2} + m. \tag{2.2}$$

Budget constraint of both types of consumers is

$$m + qp \leq y, \tag{2.3}$$

where p is the price of product and $y > 0$ is the endowment of consumers. By maximizing utility of each type of consumer subject to the budget constraint we obtain their demand functions. Quantity demanded by SCC is $q = v+\theta-p$ while the demand of traditional consumers is $q = v - p$. Hence, market demand is given by:

$$q = \beta(v + \theta - p) + (1 - \beta)(v - p). \tag{2.4}$$

Demand is increasing in the taste parameter v, decreasing in price and increasing in θ and β. If no firm commits to CSR or no SCC are present in the economy, term $\beta\theta$ is equal to zero. Since only two firms operate in the market, q is the sum of the quantities produced by the two firms, $q = q_1 + q_2$. The inverse demand function is:

$$p = v + \beta\theta - (q_1 + q_2). \tag{2.5}$$

2.2.2 Firms' Choices

In the first stage of the game each firm i (with $i = \{1, 2\}$) can decide either to commit or not to CSR. We define as ethical (e) the firm who decides to commit to CSR and as standard (s) the firm who does not invest in CSR; the set of pure strategies of firm i is given by $S_i = \{e, s\}$. The mixed-strategy set of each firm i is given by $\Delta = \{\delta \in \Re^2_+ : \sum_{s_i=e,s} \delta_{s_i} = \delta_e + \delta_s = 1\}$ and hence

[7]We adopt a framework similar to that used by Immordino (2008), where consumers are divided into two different groups: self-interested and inequity-averse consumers; both types of consumers have the same taste parameter and quasi-linear quadratic preferences. However Immordino (2008) assumes that inequity-averse consumers give a negative value to the presence of different labor standards in the economy (this assumption is due to Fehr and Schmidt, 1999). Here we assume that socially concerned consumers give a positive value to the presence of ethical firms in the market.

$\delta_s = 1 - \delta_e$. A mixed strategy profile is a vector $\left(\delta, \delta^{'}\right)$ whose components $\delta = (\delta_e, 1 - \delta_e)$ and $\delta^{'} = \left(\delta_e^{'}, 1 - \delta_e^{'}\right)$ are respectively the mixed strategies played by firms 1 and 2.

For any $s_i \in S_i$ firm i's cost function is $C_i(s_i, q_i) = c_{s_i} q_i$ where if $s_i = e$, $0 < c_e < v$ and if $s_i = s$, $c_s = 0$. In the second stage, firms observe the choices made in the first stage and simultaneously decide quantities in order to maximize profits. Products of the two firms are homogeneous. We solve the game backwards, beginning with the second stage.

The second stage problem of each firm i is

$$\max_{q_i} \pi_i = [v + \beta\theta - (q_i + q_j)]q_i - c_{s_i} q_i, \tag{2.6}$$

with $i \neq j$. To solve the second stage we have to analyze separately the following three cases: i. both firms decide to be ethical $(s_i, s_j) = (e, e)$; ii. both firms decide to be standard $(s_i, s_j) = (s, s)$; iii. firm i decides to be ethical and firm j standard $(s_i, s_j) = (e, s)$.

Case .i. If, in the first stage, both firms decide to be ethical, firms' best replies (with $i \neq j$) are

$$q_i(q_j) = \frac{1}{2}(v + \beta\theta - q_j - c_e). \tag{2.7}$$

Equilibrium quantities are

$$q_i^*(e, e) = q_j^*(e, e) = \frac{1}{3}(v + \beta\theta - c_e), \tag{2.8}$$

and equilibrium profits are

$$\pi_i^*(e, e) = \pi_j^*(e, e) = \frac{1}{9}[c_e - (v + \beta\theta)]^2. \tag{2.9}$$

Case .ii. If, in the first stage, both firms decide to be standard and hence $\theta = 0$, firms' best replies (with $i \neq j$) are

$$q_i(q_j) = \frac{1}{2}(v - q_j). \tag{2.10}$$

Equilibrium quantities are

$$q_i^*(s, s) = q_j^*(s, s) = \frac{1}{3}v, \tag{2.11}$$

and equilibrium profits are

$$\pi_i^*(s, s) = \pi_j^*(s, s) = \frac{1}{9}v^2. \tag{2.12}$$

Case .iii. If, in the first stage, firm i decides to be ethical and j standard, firms' best replies (with $i \neq j$) are

$$q_i(q_j) = \frac{1}{2}(v + \beta\theta - c_e - q_j), \tag{2.13}$$

$$q_j(q_i) = \frac{1}{2}(v + \beta\theta - q_i). \tag{2.14}$$

Equilibrium quantities are

$$q_i^*(e,s) = \frac{1}{3}(v + \beta\theta - 2c_e), \tag{2.15}$$

$$q_j^*(e,s) = \frac{1}{3}(v + \beta\theta + c_e), \tag{2.16}$$

with

$$q_i^*(e,s) < q_j^*(e,s). \tag{2.17}$$

Equilibrium profits are

$$\pi_i^*(e,s) = \frac{1}{9}[2c_e - (\beta\theta + v)]^2, \tag{2.18}$$

$$\pi_j^*(e,s) = \frac{1}{9}[c_e + \beta\theta + v]^2, \tag{2.19}$$

with

$$\pi_i^*(e,s) < \pi_j^*(e,s). \tag{2.20}$$

We now solve the first stage of the game. At each strategy profile (s_1, s_2) is associated a payoff profile $(\pi_1^*(s_1,s_2), \pi_2^*(s_1,s_2))$, where $\pi_i^*(s_1,s_2)$ is the equilibrium profit of firm i of the second stage of the game. Matrix 2x2 of Figure 2.1 represents the first stage of the game.

		Firm 2	
		e	s
Firm 1	e	$\pi_1^*(e,e)$,$\pi_2^*(e,e)$	$\pi_1^*(e,s)$,$\pi_2^*(e,s)$
	s	$\pi_1^*(s,e)$,$\pi_2^*(s,e)$	$\pi_1^*(s,s)$,$\pi_2^*(s,s)$

Figure 2.1: The First Stage.

Equilibria of the model depend on parameters c, v, θ and β. In particular there are two[8] different equilibrium configurations:

[8]There also exists a third equilibrium configuration in which the model admits two asymmetric Nash equilibria in pure strategies: $(s_1^*, s_2^*) = (e,s)$, $(s_1^*, s_2^*) = (s,e)$ and one symmetric Nash equilibrium in pure strategies $(s_1^*, s_2^*) = (s,s)$. We do not take in consideration this configuration since it is a special case of the model (see the Appendix 2.6.1).

(1) *An ethical and a standard firms coexists in the market.* The model admits two asymmetric Nash equilibria in pure strategies: $(s_1^*, s_2^*) = (e, s)$, $(s_1^*, s_2^*) = (s, e)$, and one symmetric Nash equilibrium in mixed strategies with $\delta_e^* = \delta_e'^* = \frac{(2c_e-\beta\theta)(2c_e-\beta\theta-2v)}{4c_e^2+\beta\theta(\beta\theta+2v)} \in (0,1)$.

(2) *Market is composed of two standard firms.* The model admits one symmetric Nash equilibrium in pure strategies: $(s_1^*, s_2^*) = (s, s)$.

We summarize our findings in the following Proposition.

Proposition 2.2.1 *Let $\theta \geq 2v$. If either $\beta \in \left[\frac{2v}{\theta}, 1\right]$ $\forall c_e \in (0, v)$ or $\beta \in \left(0, \frac{2v}{\theta}\right)$ and $c_e \in \left(0, \frac{\beta\theta}{2}\right)$ (with $\frac{\beta\theta}{2} < v$) then there exists two asymmetric Nash Equilibria in pure strategies in which one of the two firms chooses to be ethical and the rival chooses to be standard and there also exists a symmetric Nash Equilibrium in mixed strategies with*

$$\delta_e^* = \delta_e'^* = \frac{(2c_e - \beta\theta)(2c_e - \beta\theta - 2v)}{4c_e^2 + \beta\theta(\beta\theta + 2v)} \in (0,1). \tag{2.21}$$

Let $\theta < 2v$. If $c_e \in \left(0, \frac{\beta\theta}{2}\right)$ then there exists two asymmetric Nash Equilibria in pure strategies in which one of the two firms chooses to be ethical and the rival chooses to be standard and there also exists the symmetric Nash Equilibrium in mixed strategies $\delta_e^* = \delta_e'^*$.
For any θ, if either $\beta \in \left(0, \frac{2v}{\theta}\right)$ or $c_e \in \left[\frac{\beta\theta}{2}, v\right)$, then there exists a symmetric Nash Equilibrium in pure strategies in which the two firms chooses to be standard.

Proof See the Appendix 2.6.1.

When $\beta = 0$ (all the consumers are traditional), our model is a standard Cournot duopoly game where firms have different marginal costs; at equilibrium, each firm chooses standard production ($c_e = 0$) since it is the dominant strategy[9]. When $\beta > 0$, ethical production can be convenient for one of the two firms but not for both. Indeed, when firm i chooses to be ethical, standard production is the dominant strategy for firm j, whatever is c_e and β. If instead firm i chooses to be standard, ethical production can be convenient for firm j. Proposition 2.2.1 indicates that, in this case, there exists a substitution effect between c_e and β as incentives for firm j to choose ethical production. In particular, when SCC attach weak importance to the presence of ethical firms in the market (i.e. $\theta < 2v$), firm j chooses to be ethical

[9]This result is satisfied if and only if $0 < c_e < v$ (see Appendix 2.6.1: Proof of Proposition 2.2.1).

only if cost c_e is relatively low $\left(c_e \in \left(0, \frac{\beta\theta}{2}\right)\right)$ and β does not play any role in this choice. If instead SCC attach great importance to the presence of ethical firms in the market (i.e. $\theta \geq 2v$), a large group of SCC $\left(\beta \in \left[\frac{2v}{\theta}, 1\right]\right)$ becomes the dominant incentive for firm j to commit to CSR: if firm j chooses ethical production, a relatively high β increases so much market demand (through term $\theta\beta$) that cost of CSR becomes irrelevant in firm j's choice. The opposite holds with a relatively low value of β $\left(\beta \in \left(0, \frac{2v}{\theta}\right)\right)$.

2.3 The evolutionary model

A central question of this chapter is to study under what conditions coexistence between ethical and standard firms is an equilibrium outcome robust to evolutionary pressures. In order to investigate this issue, in this Section, we present a simple evolutionary model in which the economy is composed by a single large population of firms where a share $\delta_e \in [0, 1]$ is ethical and a share $\delta_s = 1 - \delta_e$ is standard. Then we analyze whether coexistence between ethical and standard firms – i.e. $0 < \delta_e < 1$ – is a *stable* population state both in a static and a dynamic analysis.

2.3.1 A static analysis

Let us assume that our economy is constituted by a single large (infinite) population of firms programmed to play either ethical or standard production (e or s). The proportions of ethical and standard firms are respectively $\delta_e \in [0, 1]$ and $\delta_s = 1 - \delta_e$, with $\delta = (\delta_e, \delta_s) \in \Delta$. Population state δ is formally identical to the mixed strategy played by firms in the two-stage game of Section 2.2; hence the mixed-strategy set Δ represents all the possible population states of our economy. Let us now assume that firms are pairwise randomly matched: Figure 2.1 represents the four possible matches and the associated payoffs gained by firms in each possible match[10]. Let us also assume that the population of firms in our economy is originally in state $\delta \in \Delta$ (as an example we may think of a situation in which δ is the population state led by evolution). The profit earned by a firm drawn at random from the population state δ when also its rival is drawn at random from δ is given by:

[10]The four possible matches are (e, e), (s, s), (s, e) and (e, s).

$$\Pi(\delta,\delta) = \left[\begin{array}{cc} \delta_e & 1-\delta_e \end{array}\right] \left[\begin{array}{cc} \pi^*(e,e) & \pi^*(e,s) \\ \pi^*(s,e) & \pi^*(s,s) \end{array}\right] \left[\begin{array}{c} \delta_e \\ 1-\delta_e \end{array}\right] \quad (2.22)$$

$$= A\delta_e^2 + B\delta_e + C. \quad (2.23)$$

where

$$A = \left[\pi^*(e,e) - \pi^*(s,e) - \pi^*(e,s) + \pi^*(s,s)\right], \quad (2.24)$$

$$B = \left[\pi^*(s,e) + \pi^*(e,s) - 2\pi^*(s,s)\right], \quad (2.25)$$

and

$$C = \pi^*(s,s). \quad (2.26)$$

$\Pi\left(\delta^{'},\delta\right)$ is the profit earned by a firm drawn at random from an alternative population state $\delta^{'} \in \Delta$ when its rival is drawn at random from population state $\delta \in \Delta$, $\Pi\left(\delta,\delta^{'}\right)$ is the profit earned by a firm drawn at random from $\delta \in \Delta$ when its rival is drawn at random from $\delta^{'}$ and $\Pi\left(\delta^{'},\delta^{'}\right)$ is the profit earned by a firm drawn at random from $\delta^{'}$ when also its rival is drawn at random from $\delta^{'}$. We define as evolutionary stable a population state which satisfies the following definition.

Definition A strategy (population state) $\delta \in \Delta$ is defined as an *evolutionary stable strategy* (ESS) if for every $\delta^{'} \neq \delta$ it is:

(a) $\Pi(\delta,\delta) > \Pi\left(\delta^{'},\delta\right)$; or

(b) $\Pi(\delta,\delta) = \Pi\left(\delta^{'},\delta\right)$ and $\Pi\left(\delta,\delta^{'}\right) > \Pi\left(\delta^{'},\delta^{'}\right)$.

In other words, a population state δ is evolutionary stable if, for each alternative population state, there exists a positive invasion barrier such that, if the population share of firms of the alternative population state falls below this barrier, then firms of population state δ earns a higher payoff than that of the alternative population state (see J. W. Weibull, 1995). In our model, an equilibrium configuration is represented by an evolutionary stable population state (ESS). The following proposition indicates the ESS of the model.

Proposition 2.3.1 *When either* $\beta \in \left[\frac{2v}{\theta},1\right]$ *or* $c_e \in \left(0,\frac{\beta\theta}{2}\right)$*, there exist an ESS in which ethical and standard firms coexists in the market:*

$$\delta_e^* = \delta_e^{'*} = \frac{(2c_e-\beta\theta)(2c_e-\beta\theta-2v)}{4c_e^2+\beta\theta(\beta\theta+2v)} \in (0,1). \quad (2.27)$$

Otherwise, there exists an ESS in which market is entirely composed of standard firms: $\delta_e^* = \delta_e^{'*} = 0$.

Proof See the Appendix 2.6.1.

When the group of SCC is large enough $\left(\beta \in \left[\frac{2v}{\theta}, 1\right]\right)$ or the cost of CSR is low $\left(c_e \in \left(0, \frac{\beta\theta}{2}\right)\right)$, a market entirely composed of either ethical or standard firms is not evolutionary stable. The ESS corresponds to the unique symmetric mixed strategies Nash equilibrium of the two-stage game of Section 2.2[11]; this implies that population shares of ethical and standard firms, δ_e^* and δ_s^*, are strictly positive: ethical and standard firms coexists into our economy and earn $\Pi(\delta^*, \delta^*)$ (see equation (2.22) where $\delta_e = \delta_e^*$). Otherwise, the ESS corresponds to the unique symmetric pure strategies Nash equilibrium (s, s) of the two-stage game (Section 2.2); the evolutionary stable population share of ethical firms is equal to zero and population is entirely composed of standard firms which earn $\pi^*(s, s)$. This is also the case when all the consumers are traditional, i.e. when $\beta = 0$.

2.3.2 A dynamic analysis

Let us analyze the evolutionary model presented in the previous section adopting a dynamic approach. We undertake the most basic dynamic model used in the evolutionary literature, the Replicator Dynamics (hereafter RD). Time is measured continuously and, in every time period $t \geq 0$, firms from a single large (infinite) population are pairwise randomly matched; Figure 2.1 represents the four possible matches and the associated payoffs gained by firms in each possible match. Each firm is programmed to play a pure strategy (e or s) and, at each time period t, $\delta_t = (\delta_{e,t}, 1 - \delta_{e,t}) \in \Delta$ represents respectively the proportions of ethical $(\delta_{e,t})$ and standard $(1 - \delta_{e,t})$ firms in the population respectively (i.e. the population state). As in the previous subsection, population state $\delta_t \in \Delta$ is formally identical to a mixed strategy. The expected profit using pure strategy s_i (e or s), at a random match t, when the population is in state $\delta_t \in \Delta$, is $\Pi_t(s_i, \delta_t)$, while the average expected profit in the population at any random match t (i.e. the profit earned by a firm drawn at random from the population) is $\Pi_t(\delta_t, \delta_t)$. Supposing that the net reproduction rate of each firm (i.e. each strategy s_i) is proportional to its score $\Pi_t(s_i, \delta_t)$, with the RD we have the following continuous-time dynamic system for $\delta_{s,t}$:

[11] When the group of SCC is large enough or the cost of CSR is low, our evolutionary model corresponds to a Hawk-Dove game; a well-known result in the evolutionary literature is that, in a Hack-Dove game, the ESS corresponds to the unique symmetric mixed strategy equilibrium of the game: pure hawkishness or pure doveness are not evolutionary stable strategies (see J. W. Weibull, 1995; F. Vega-Redondo, 2003).

$$\dot{\delta}_{s_i,t} = \delta_{s_i,t}[\Pi_t(s_i, \delta_t) - \Pi_t(\delta_t, \delta_t)] \tag{2.28}$$

where $\dot{\delta}_t$ is the derivative of δ_t with respect of t. A well-known result in the evolutionary literature which correlates the RD with the notion of ESS (due to Hofbauer et al., 1979) is that any population state corresponding to an ESS is asymptotically stable in terms of the RD with a single population of players[12]. Hence, it follows that

Proposition 2.3.2 *When either* $\beta \in \left[\frac{2v}{\theta}, 1\right]$ *or* $c_e \in \left(0, \frac{\beta\theta}{2}\right)$*, there exist a asymptotically stable population state in which ethical and standard firms coexists in the market:*

$$\delta^*_{e,t} = \delta'^*_{e,t} = \frac{(2c_e - \beta\theta)(2c_e - \beta\theta - 2v)}{4c_e^2 + \beta\theta(\beta\theta + 2v)} \in (0, 1). \tag{2.29}$$

Otherwise, there exists a asymptotically stable population state in which market is entirely composed of standard firms: $\delta^*_{e,t} = \delta'^*_{e,t} = 0$.

Proof See Proposition (2.3.1) and Hofbauer et al. (1979).

2.4 Policy Implications

In the Green Paper (2001), CSR is defined as an instrument which can promote "a positive contribution to the strategic goal decided in Lisbon: to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion" (see the Green Paper, 2001, p. 6). The expansion of CSR is thus considered crucial for the EU institution. In this Section we investigate how a policy maker can expand CSR. We concentrate our analysis on two kinds of policies that affect preferences – through β – and cost of CSR – through c_e.[13] A policy based on schooling and education may increment the number of socially concerned consumers (β) in the economy, and a policy maker can promote CSR providing subsidies to ethical firms in order to reduce their social costs c_e.

Let us assume that the economy is at ESS, $\delta^*_e = \frac{(2c_e - \beta\theta)(2c_e - \beta\theta - 2v)}{4c_e^2 + \beta\theta(\beta\theta + 2v)} \in (0, 1)$. A policy which reduces social costs of ethical firms (c_e) always causes an expansion of ethical firms in the economy (δ^*_e) and a reduction of standard

[12]This result is not satisfied in case of multiple populations of players (see D. Fudenberg and D. K. Levine, 1998).

[13]There are other parameters which may be included in our analysis; however, given our framework β and c_e generate more interesting results.

firms (δ_s^*): $\frac{\sigma\delta_e^*}{\sigma c_e} < 0$ and $\frac{\sigma\delta_s^*}{\sigma c_e} > 0$ (see the Appendix 2.6.2). Moreover, as c_e goes to 0, the economy tends to be entirely composed of ethical firms $\delta_e^* \to 1$. An interesting result is also obtained when c_e tends to its upper value. When cost of CSR is low $\left(c_e \in \left(0, \frac{\beta\theta}{2}\right)\right)$ and c_e tends to its upper value $\left(\frac{\beta\theta}{2}\right)$, the economy tends to be entirely composed of standard firms $\delta_e^* \to 0$; this does not happen when SCC' group is large $\left(\beta \in \left[\frac{2v}{\theta}, 1\right]\right)$. In this case, as c_e tends to its upper value (v), the proportion of ethical firms does not tend to zero but to a positive fixed value. Hence, when a policy maker does not reduce social cost of ethical firms and the cost tends to its upper value, a large group of SCC is essential to have a market in which ethical firms operate. These results are summarized in Figures 2.2 and 2.3.

	$c_e \to 0$	$c_e \to \frac{\beta\theta}{2}$
δ_e^*	1	0
δ_s^*	0	1

Figure 2.2: The ESS when cost of CSR is low.

	$c_e \to 0$	$c_e \to v$
δ_e^*	1	$\frac{(\beta\theta-2v)\beta\theta}{4v^2+\beta\theta(\beta\theta+2v)} > 0$
δ_s^*	0	$\frac{(\beta\theta+v)4v}{4v^2+\beta\theta(\beta\theta+2v)} > 0$

Figure 2.3: The ESS when the SSC' group is large.

A policy on β has a similar impact on δ_e^* and δ_s^*. In particular, a policy which increments the number of socially concerned consumers β always causes an expansion of ethical firms in the economy (δ_e^*) and a reduction of standard firms (δ_s^*): $\frac{\sigma\delta_e^*}{\sigma\beta} < 0$ and $\frac{\sigma\delta_s^*}{\sigma\beta} > 0$ (see the Appendix 2.6.2). However, differently from a policy on c_e, a policy on β cannot induce the economy to be entirely composed of ethical firms: as β tends to its upper value (1), the share of ethical firms tends to a positive fixed value which is negatively correlated to c_e (as c_e goes to 0, the value of δ_e^* tends to 1). When β tends to 0, the economy tends to be entirely composed of standard firms (δ_e^* tends to a negative value) and, finally, as β tends to $\frac{2v}{\theta}$, the share of ethical firms tends to a positive fixed value strictly lower than one.

2.5 Concluding remarks

We propose a partial equilibrium model in which the presence of socially concerned consumers affect firms' decisions to commit to CSR. We found that either a large group of socially concerned consumers or a low cost of CSR induces an equilibrium outcome in which ethical and standard firms coexist in the market. Otherwise, the population of firms is entirely composed of standard firms. This result is relevant because it clarifies how the size of socially concerned consumers' group affects firms' decision to commit to CSR. A strictly positive share of socially concerned consumers is essential to obtain these results: when all the consumers are traditional our model is a standard Cournot game in which no firm decides to commit to CSR.

We also analyzes two kinds of policies: a policy which increments the number of socially concerned consumers in the economy and a policy which reduces social costs of ethical firms. We found that any policy which either increments the share of socially concerned consumers or reduces cost of CSR always induces an expansion (reduction) of ethical (standard) firms in the economy. However only a policy which reduces cost of CSR is able to induce the economy to be entirely composed of ethical firms. Our policy analysis suffer from the partial equilibrium set-up adopted; indeed an extension of our analysis to a general equilibrium set-up could give a better understanding of our results in terms of policies and their implications on welfare.

2.6 Appendix

2.6.1 Proofs of Propositions

Proof of Proposition 2.2.1.
Let us suppose that firm j chooses to be ethical. From equations (2.9) and (2.19), firm i always chooses to be standard since inequality

$$\pi_i^*(s,e) = \frac{1}{9}[c_e + \beta\theta + v]^2 > \frac{1}{9}[c_e - (v + \beta\theta)]^2 = \pi_i^*(e,e) \tag{2.30}$$

is always satisfied.
Let us suppose that firm j chooses to be standard. From equations (2.12) and (2.18), firm i chooses to be ethical if and only if

$$\pi_i^*(e,s) = \frac{1}{9}[2c_e - (\beta\theta + v)]^2 > \frac{1}{9}v^2 = \pi_i^*(s,s). \tag{2.31}$$

Inequality (2.31) can be rewritten as

$$4c_e^2 - 4c_e(\beta\theta + v) + \beta^2\theta^2 + 2\beta\theta v > 0 \tag{2.32}$$

The left-hand side of inequality (2.32) is a second-order polynomial which is represented by a convex parabola whose roots are

$$c_{e1} = \frac{\beta\theta}{2} \tag{2.33}$$

and

$$c_{e2} = \frac{\beta\theta + 2v}{2}, \tag{2.34}$$

with $\Delta = 16v^2 > 0$ (for any value of v) and $c_{e2} > c_{e1} > 0$ for $\beta > 0$. If $\beta = 0$, $c_{e1} = 0$, $c_{e2} = v$, and inequality (2.31) is never satisfied: firm i chooses to be standard for any value of $c_e \in (0, v)$. If $\beta > 0$, inequality (2.31) is satisfied if and only if $c_e \in \left(0, \min\left(\frac{\beta\theta}{2}, v\right)\right)$ (firm i chooses to be ethical); if instead $c_e \in \left(\min\left(\frac{\beta\theta}{2}, v\right), v\right)$, inequality (2.31) is not satisfied and firm i chooses to be standard. Finally, if $c_e = \min\left(\frac{\beta\theta}{2}, v\right)$ with $c_e \neq v$, firm i is indifferent between e and s. Hence

(i) When $\theta < 2v$, $v > c_{e1}$ for any value of $\beta \in (0, 1]$ and

  (a) if $c_e \in (0, c_{e1})$, firm i chooses to be ethical;

  (b) if $c_e = c_{e1}$, firm i is indifferent between ethical and standard production; and

  (c) if $c_e \in (c_{e1}, v)$, firm i chooses to be standard.

(ii) When $\theta \geq 2v$ and $\beta \in \left[\frac{2v}{\theta}, 1\right]$, firm i chooses to be ethical.

(iii) When $\theta \geq 2v$ and $\beta \in \left(0, \frac{2v}{\theta}\right)$, cases (a), (b) and (c) holds.

To summarize there are three equilibrium configurations.

(1) If $\beta > 0$ and either case i.a holds or case ii holds or case iii.a holds, the model admits two asymmetric Nash equilibria in pure strategies $(s_1^*, s_2^*) = (e, s)$ and $(s_1^*, s_2^*) = (s, e)$.

(2) If either $\beta = 0$ or $\beta > 0$ and case i.c or $\beta > 0$ and case iii.c hold, the model admits one symmetric Nash equilibrium in pure strategies: $(s_1^*, s_2^*) = (s, s)$.

(3) If $\beta > 0$ and either case i.b or case iii.b holds, the model admits one symmetric Nash equilibrium in pure strategies $(s_1^*, s_2^*) = (s, s)$ and two asymmetric Nash equilibria in pure strategies $(s_1^*, s_2^*) = (e, s)$ and $(s_1^*, s_2^*) = (s, e)$.

Let us now analyze the case in which firms 1 and 2 respectively play mixed strategies δ and $\delta^{'}$ with $\delta, \delta^{'} \in \Delta$. From

$$E\pi_1(s_1 = e) = E\pi_1(s_1 = s) \tag{2.35}$$

and

$$E\pi_2(s_2 = e) = E\pi_2(s_2 = s), \tag{2.36}$$

where $E\pi_i(s_i)$ is the expected profit of firm i when firm i plays pure strategy s_i and firm j mixed strategy $\delta \in \Delta$, it holds that

$$\delta_e = \delta_e^{'} \equiv \frac{\pi^*(e,s) - \pi^*(s,s)}{[\pi^*(e,s) - \pi^*(s,s)] + [\pi^*(s,e) - \pi^*(e,e)]} = \frac{(2c_e - \beta\theta)(2c_e - \beta\theta - 2v)}{4c_e^2 + \beta\theta(\beta\theta + 2v)}. \tag{2.37}$$

Equality (2.37) is an equilibrium mixed strategy if and only if $\delta_e = \delta_e^{'} \in (0,1)$. This holds only in case (1). In case (2) $\delta_e = \delta_e^{'} < 0$, while, in case (3) $\delta_e = \delta_e^{'} > 1$.

Proof of Proposition 2.3.1.
From conditions i. and ii. of definition (2.3.1), it follows that an ESS must be a symmetric Nash equilibrium. Thus, the candidates to be an ESS are the symmetric Nash equilibria of the game: $(s_1, s_2) = (s, s)$ (which implies $\delta_e^* = \delta_e^{'*} = 0$) and (δ^*, δ^*) with $\delta_e^* = \delta_e^{'*} = \frac{(2c_e - \beta\theta)(2c_e - \beta\theta - 2v)}{4c_e^2 + \beta\theta(\beta\theta + 2v)} \in (0,1)$.

Let us verify if these two equilibria are evolutionary stable strategies. Let us start with (δ^*, δ^*). Since (δ^*, δ^*) is a mixed strategies equilibrium, it holds that

$$\Pi(\delta^*, \delta^*) = \Pi\left(\delta^{'}, \delta^*\right) \tag{2.38}$$

This implies that (δ^*, δ^*) to be an ESS must verify

$$\Pi(\delta^*, \delta') > \Pi\left(\delta^{'}, \delta'\right) \quad \text{for all } \delta^{'} \neq \delta. \tag{2.39}$$

$\Pi(\delta^*, \delta') - \Pi\left(\delta^{'}, \delta'\right)$ is given by

$$\Pi(\delta^*, \delta') - \Pi\left(\delta^{'}, \delta'\right) = \frac{a^2\delta_e^{'2} - 2ab\delta_e^{'2} + b^2}{a} = \frac{\delta_e^{'}(a-b)^2}{a}, \tag{2.40}$$

where

$$a = [\pi^*(s,e) - \pi^*(e,e)] + [\pi^*(e,s) - \pi^*(s,s)] \tag{2.41}$$

and

$$b = [\pi^*(e,s) - \pi^*(s,s)]. \tag{2.42}$$

Since $\delta_e^{'} \in (0,1)$ and $a > 0$ (from case 1 – Proof of Proposition 2.2.1 – it holds that $\pi^*(s,e) > \pi^*(e,e)$ and $\pi^*(e,s) > \pi^*(s,s)$), equality (2.39) is satisfied and (δ^*, δ^*) is an ESS.

Let us now verify if $(s_1, s_2) = (s, s)$ is an ESS. (s, s) is an equilibrium in cases 2 and 3 (see Proof of Proposition 2.2.1). Let us assume that we are in case 2 (see Proof of Proposition 2.2.1). $\Pi(\delta^*, \delta^*) - \Pi\left(\delta^{'}, \delta^*\right)$ is given by

$$\Pi(\delta^*, \delta^*) - \Pi\left(\delta^{'}, \delta^*\right) = \pi^*(s,s) - [\delta_e^{'}\pi^*(e,s) + (1-\delta_e^{'})\pi^*(s,s)] = b\delta_e^{'}, \quad (2.43)$$

with $\delta_e^{'} \in (0,1)$ and $b < 0$ (from case 2 – Proof of Proposition 2.2.1 – it holds that $\pi^*(e,s) < \pi^*(s,s)$). Hence condition i. of definition (2.3.1) is satisfied and $(s_1, s_2) = (s, s)$ is an ESS. Finally, let us assume that we are in case 3 (see Proof of Proposition 2.2.1). In this case, it is $\Pi(\delta^*, \delta^*) = \Pi\left(\delta^{'}, \delta^*\right)$ (condition i. of definition 2.3.1 is not satisfied) and $\Pi\left(\delta^*, \delta^{'}\right) - \Pi\left(\delta^{'}, \delta^{'}\right)$ is given by

$$\Pi\left(\delta^*, \delta^{'}\right) - \Pi\left(\delta^{'}, \delta^{'}\right) = \delta_e^{'2}\left[\pi^*(s,e) - \pi^*(e,e)\right], \quad (2.44)$$

where $\pi^*(s,e) > \pi^*(e,e)$ and $\delta_e^{'} \in (0,1)$. Hence condition ii. of definition (2.3.1) is satisfied and $(s_1, s_2) = (s, s)$ is an ESS also in case 3.

2.6.2 Policy Implications

Policy on c_e

Let assume that economy is at ESS, $\delta_e^* = \frac{(2c_e - \beta\theta)(2c_e - \beta\theta - 2v)}{4c_e^2 + \beta\theta(\beta\theta + 2v)} \in (0,1)$ (case 1, Proof of Proposition 2.2.1). Derivative of δ_e^* with respect to c_e is:

$$\frac{\sigma\delta_e^*}{\sigma c_e} = \frac{16(v+\beta\theta)c_e^2 - 8\beta\theta v^2 - 4\beta^3\theta^3 - 12\beta^2\theta^2 v}{\left(4c_e^2 + \beta^2\theta^2 + 2\beta\theta v\right)^2}. \quad (2.45)$$

Since the denominator $\left(4c_e^2 + \beta^2\theta^2 + 2\beta\theta v\right)^2$ is strictly greater than zero, the sign of $\frac{\sigma\delta_e^*}{\sigma c_e}$ depends on the sign of the numerator $16(v+\beta\theta)c_e^2 - 8\beta\theta v^2 - 4\beta^3\theta^3 - 12\beta^2\theta^2 v$, which is a second-order polynomial (represented by a convex parabola) whose roots are

$$\underline{c} = -\frac{\sqrt{2\beta\theta v + \beta^2\theta^2}}{2} < 0 \quad (2.46)$$

and

$$\overline{c} = \frac{\sqrt{2\beta\theta v + \beta^2\theta^2}}{2} > 0. \quad (2.47)$$

If $\overline{c} \geq v$, it is $\frac{\sigma\delta_e^*}{\sigma c_e} < 0$ for any $c_e \in (0, v)$; if instead $\overline{c} < v$, $\frac{\sigma\delta_e^*}{\sigma c_e} < 0$ if $c_e \in (0, \overline{c})$ and $\frac{\sigma\delta_e^*}{\sigma c_e} \geq 0$ if $c_e \in [\overline{c}, v)$. This implies the following:

(i) If $\beta \geq \frac{\left(\sqrt{20}-2\right)v}{2\theta}$, it is $\frac{\sigma\delta_e^*}{\sigma c_e} < 0$;

(ii) If $\beta < \frac{\left(\sqrt{20}-2\right)v}{2\theta}$ and $c_e \in (0, \overline{c}]$, it is $\frac{\sigma\delta_e^*}{\sigma c_e} \leq 0$;

(iii) If $\beta < \frac{\left(\sqrt{20}-2\right)v}{2\theta}$ and $c_e \in (\overline{c}, v)$, it is $\frac{\sigma\delta_e^*}{\sigma c_e} > 0$.

Since $\frac{\left(\sqrt{20}-2\right)v}{2\theta} > \frac{2v}{\theta}$ and $\overline{c} > \frac{\beta\theta}{2}$, it is $\frac{\sigma\delta_e^*}{\sigma c_e} > 0$ for any value of c_e and β that satisfies case (1) of Proof of Proposition 2.2.1, i.e. for any value of c_e and β such that the economy is at the ESS $\delta_e^* = \frac{(2c_e-\beta\theta)(2c_e-\beta\theta-2v)}{4c_e^2+\beta\theta(\beta\theta+2v)} \in (0,1)$. Moreover, since $\delta_s^* = 1 - \delta_e^*$, it is $\frac{\sigma\delta_s^*}{\sigma c_e} < 0$ for any value of c_e and β such that the economy is at the ESS $\delta_e^* = \frac{(2c_e-\beta\theta)(2c_e-\beta\theta-2v)}{4c_e^2+\beta\theta(\beta\theta+2v)} \in (0,1)$.

Policy on β
Let assume that economy is at ESS, $\delta_e^* = \frac{(2c_e-\beta\theta)(2c_e-\beta\theta-2v)}{4c_e^2+\beta\theta(\beta\theta+2v)} \in (0,1)$ (case 1, Proof of Proposition 2.2.1). Derivative of δ_e^* with respect to β is:

$$\frac{\sigma\delta_e^*}{\sigma\beta} = \frac{4\theta c_e\left(-4c_e^2 + \beta^2\theta^2 + 2\beta\theta v + 2v^2\right)}{\left(4c_e^2 + \beta^2\theta^2 + 2\beta\theta v\right)^2}. \tag{2.48}$$

Since the denominator $\left(4c_e^2 + \beta^2\theta^2 + 2\beta\theta v\right)^2$ is strictly greater than zero, the sign of $\frac{\sigma\delta_e^*}{\sigma\beta}$ depends on the sign of the numerator $4\theta c_e\left(-4c_e^2 + \beta^2\theta^2 + 2\beta\theta v + 2v^2\right)$, which is a second-order polynomial (represented by a convex parabola) whose roots are

$$\beta_1 = -\frac{v + \sqrt{4c_e^2 - v^2}}{\theta} < 0 \tag{2.49}$$

and

$$\beta_2 = \frac{-v + \sqrt{4c_e^2 - v^2}}{\theta}, \tag{2.50}$$

with $\Delta = 4c_e^2 - v^2$. When $c_e \in \left(0, \frac{v}{2}\right]$, $\Delta \leq 0$; this implies that the numerator of equality (2.48) is strictly greater than zero for any $\beta \in (0,1)$ and $\frac{\sigma\delta_e^*}{\sigma\beta} > 0$. Let us study the case in which $c_e \in \left(\frac{v}{2}, v\right)$ and $\Delta > 0$. In this case, it results that $\beta_2 \leq 0$ if $c_e \in \left(\frac{v}{2}, \frac{v}{\sqrt{2}}\right]$ and $\beta_2 > 0$ if $c_e \in \left(\frac{v}{\sqrt{2}}, v\right)$. Hence, when $c_e \in \left(0, \frac{v}{\sqrt{2}}\right]$, the numerator of equality (2.48) is strictly greater than zero for any $\beta \in (0,1)$ and $\frac{\sigma\delta_e^*}{\sigma\beta} > 0$. When $c_e \in \left(\frac{v}{\sqrt{2}}, v\right)$, $\beta_2 < 1$ if and only if

$$4c_e^2 - 2v^2 - 2\theta v - \theta^2 < 0. \tag{2.51}$$

The left-hand side of inequality (2.51) is a second-order polynomial represented by a convex parabola whose roots are

$$c_e^{'} = -\frac{\sqrt{2v^2 + \theta^2 + 2\theta v}}{2} < 0 \tag{2.52}$$

and

$$c_e^{''} = \frac{\sqrt{2v^2 + \theta^2 + 2\theta v}}{2} > 0. \tag{2.53}$$

If $c_e^{''} > v$, then $\beta_2 < 1$ for any $c_e \in (0, v)$. If instead $c_e^{''} \leq v$, then $\beta_2 < 1$ if $c_e < c_e^{''}$ and $\beta_2 \geq 1$ if $c_e \geq c_e^{''}$. In particular, $c_e^{''} > v$ is satisfied if and only if

$$\theta^2 + 2\theta v - 2v^2 > 0. \tag{2.54}$$

The left-hand side of inequality (2.54) is a second-order polynomial represented by a convex parabola whose roots are

$$\theta_1 = -v(\sqrt{3} + 1) < 0 \tag{2.55}$$

and

$$\theta_2 = v(\sqrt{3} + 1) > 0, \tag{2.56}$$

with $\Delta = 12v^2 > 0$. Hence

- if $\theta \leq \theta_2$, $\theta^2 + 2\theta v - 2v^2 \leq 0$ and $c_e^{''} \leq v$;
- if $\theta > \theta_2$, $\theta^2 + 2\theta v - 2v^2 > 0$, $c_e^{''} > v$ and $\beta_2 < 1$ for any $c_e \in (0, v)$.

In summary, it follows that

(a) $\frac{\sigma\delta_e^*}{\sigma\beta} > 0$ if $c_e \in \left(0, \frac{v}{\sqrt{2}}\right]$ or $\theta \leq \theta_2$, $c_e \in \left(\frac{v}{\sqrt{2}}, c_e^{''}\right)$ and $\beta \in (\beta_2, 1]$ or $\theta > \theta_2$ and $\beta \in (\beta_2, 1]$;

(b) $\frac{\sigma\delta_e^*}{\sigma\beta} = 0$ if $\theta \leq \theta_2$, $c_e \in \left(\frac{v}{\sqrt{2}}, c_e^{''}\right)$ and $\beta = \beta_2$ or $\theta > \theta_2$ and $\beta = \beta_2$;

(c) $\frac{\sigma\delta_e^*}{\sigma\beta} < 0$ if $\theta \leq \theta_2$, $c_e \in \left(\frac{v}{\sqrt{2}}, c_e^{''}\right)$ and $\beta \in (0, \beta_2)$ or $\theta \leq \theta_2$ and $c_e \in \left[c_e^{''}, v\right)$ or $\theta > \theta_2$ and $\beta \in (0, \beta_2)$.

Let us verify that in case 1 of Proof of Proposition 2.2.1, case (a) is always satisfied. Let us assume that $\theta \geq 2v$ and $\beta \in \left[\frac{2v}{\theta}, 1\right]$. In this case, it is $\theta > \theta_2$ and $\beta_2 < \frac{2v}{\theta}$; this implies that $\left[\frac{2v}{\theta}, 1\right]$ is a subset of $(\beta_2, 1]$ and hence $\frac{\sigma\delta_e^*}{\sigma\beta} > 0$ (see case (a)).
Let us assume that $\theta \geq 2v$, $\beta \in \left[0, \frac{2v}{\theta}\right)$ and $c_e \in (0, c_{e1})$. In this case, it is $\theta > \theta_2$ and $\beta_2 < \frac{2v}{\theta}$. If $\beta \in \left(\beta_2, \frac{2v}{\theta}\right]$, it is $\frac{\sigma\delta_e^*}{\sigma\beta} > 0$; if instead $\beta \in (0, \beta_2)$, then

we have to check for c_e. In particular, it results that $c_{e1} < \frac{v}{\sqrt{2}}$ and $(0, c_{e1})$ is a subset of $\left(0, \frac{v}{\sqrt{2}}\right]$ if $\beta < \frac{2v}{\theta\sqrt{2}} < \frac{2v}{\theta}$ and $\frac{2v}{\theta\sqrt{2}} > \beta_2$. Hence, for $\beta \in (0, \beta_2)$, $\beta < \frac{2v}{\theta\sqrt{2}}$ and $\frac{\sigma\delta_e^*}{\sigma\beta} > 0$ (see case (a)).
Let us assume that $\theta < 2v$ and $c_e \in (0, c_{e1})$. It results that $c_{e1} < \frac{v}{\sqrt{2}}$ if $\theta < \frac{2v}{\beta\sqrt{2}}$ and $\frac{2v}{\beta\sqrt{2}} \geq 2v$ if $\beta \leq \frac{1}{\sqrt{2}}$. Hence, if $\beta \leq \frac{1}{\sqrt{2}}$, $\theta < 2v$ implies that $(0, c_{e1})$ is a subset of $\left(0, \frac{v}{\sqrt{2}}\right]$ and $\frac{\sigma\delta_e^*}{\sigma\beta} > 0$. If instead $\beta \in \left(\frac{1}{\sqrt{2}}, 2v\right)$, it is $\frac{2v}{\beta\sqrt{2}} < 2v$ and $c_{e1} > \frac{v}{\sqrt{2}}$ for $\theta \in \left(\frac{2v}{\beta\sqrt{2}}, 2v\right)$. Since $\frac{2v}{\beta\sqrt{2}} > \theta_2$, $\theta \in \left(\frac{2v}{\beta\sqrt{2}}, 2v\right)$ implies $\theta > \theta_2$. Moreover, since $\beta_2 < \frac{1}{\sqrt{2}}$, $\beta > \frac{1}{\sqrt{2}}$ implies $\beta \in (\beta_2, 1]$ and case (a) holds: $\frac{\sigma\delta_e^*}{\sigma\beta} > 0$.

We can conclude that, for any value of c_e and β such that the economy is at the ESS $\delta_e^* = \frac{(2c_e - \beta\theta)(2c_e - \beta\theta - 2v)}{4c_e^2 + \beta\theta(\beta\theta + 2v)} \in (0, 1)$, it is $\frac{\sigma\delta_e^*}{\sigma\beta} > 0$ and $\frac{\sigma\delta_s^*}{\sigma\beta} < 0$ because $\delta_e^* = 1 - \delta_s^*$.

Chapter 3

The Role of Income Distribution in the Diffusion of Corporate Social Responsibility

Abstract

The purpose of this chapter is to investigate the link between CSR growth and income distribution. We present a general equilibrium model where social responsibility enters both firms' and consumers' decisions. The model admits one single equilibrium. However, depending on the values of parameters, different scenarios may arise, each characterized by a different diffusion of CSR. We study the conditions under which there exists a virtuous circle which ties increases in the diffusion of CSR to reductions in income inequality and *viceversa*. Under certain circumstances, any policy which promotes CSR diffusion induces a reduction in income inequality. By contrast, when such conditions are not satisfied, only redistributive policies may generate the virtuous circle.

3.1 Introduction

In recent decades, the EU has attributed great prominence to corporate social responsibility (CSR), "[a] concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis" (see Green Paper, 2001).

In the Green Paper (2001), CSR is defined as an instrument which can promote "a positive contribution to the strategic goal decided in Lisbon: to become the most competitive and dynamic knowledge-based economy in

the world, capable of sustainable economic growth with more and better jobs and greater social cohesion" (see the Green Paper, 2001, p. 6). The expansion of CSR is thus considered crucial for the EU institution. However, although an increasing number of firms have started to promote CSR – *ethical firms* (see Paton and Siegel, 2005) and consumers have a positive predisposition towards CSR (see Environics International, 1999; MORI, 2000; The Co-operative Bank, 2007), the ethical market is still a small proportion of total annual household consumer spending (see for instance the The Co-operative Bank, 2007). This can be partly explained by the fact that commodities produced in the ethical market are usually more expensive than standard ones (see for instance Starr, 2009). Several studies show that consumers that purchase ethical commodities usually have a medium-high level of income (see for instance Livraghi, 2007a; D'Alessio et al., 2007a).

The purpose of this chapter is to investigate the link between CSR and income distribution. Our main finding is that under certain circumstances there exists a virtuous circle which ties increases in the diffusion of CSR to reductions in income inequality. This result has strong policy implications if the public authority considers both CSR growth and inequality reduction as two crucial policy goals.

Research into CSR can be traced back to an important question in the political and economic debate: do firms have any kind of social responsibility beyond the maximization of profits (Friedman, 1970; Arrow, 1973)? This kind of responsibility in firms decisions has been underestimated by mainstream theory. However, the dichotomy between theoretical conclusions and actual firms' behavior appears puzzling. As a result, not surprisingly, CSR research has mainly focused on why firms choose to internalize social costs beyond legal constraints.[1] To answer this question, some scholars introduce the concept of CSR in an oligopoly framework with product differentiation, since this approach is seen as the natural tool to solve the above dichotomy. The fact that a group of consumers is concerned about social traits of products – *socially concerned consumers* – is the foundation of the existence of ethical firms. Contributions in this strand of literature have been made, amongst others, by Arora and Gangopadhyay (1995); Amacher et al. (2004); Alves and Santos-Pinto (2008); Becchetti and Solferino (2003); Conrad (2005); Davies (2005); Mitrokostas and Petrakis (2008). We follow this literature by assuming that some consumers are socially concerned, and that CSR is modeled as a variable cost that affects the prices of ethical firms. By contrast, we adopt a general equilibrium perspective.[2] This approach allows us to go

[1] In Chapter 1 we extensively analyze literature on CSR addressed to consumers. A critical survey on this debate is also Kitzmueller (2008).

[2] Applications of CSR to a general equilibrium set-up has not been deeply analyzed so

one step forward in understanding ethical consumption, that is, it allows us to investigate the relationship between CSR growth and income inequality. Such a relationship can not be properly analyzed in a partial equilibrium set-up. The role of income distribution in the diffusion of CSR, to the best of our knowledge, has not been yet analyzed, even if, as shown by Starr (2009), Livraghi (2007a) and D'Alessio et al. (2007a), it is a crucial variable in determining ethical firms' demand.

We present a simple version of a general equilibrium model. The economy is divided into two sectors, the standard and the ethical. We refer to the latter as the sector where ethical firms operate. Moreover, a share of consumers are socially concerned. Hence, social responsibility is incorporated in the model both in production and consumption decisions. We make two assumptions. i) Traditional consumers consider ethical and standard products as perfect substitutes, while socially concerned consumers have nonhomothetic preferences: as the attainable level of utility increases, the preference for ethical products rises. As a result, an increase in income may induce socially concerned consumers to switch from standard to ethical products rather than consuming more of standard goods (see Livraghi, 2007a; D'Alessio et al., 2007a).[3] ii) Only one group of workers receives a share of profits in addition to wages. This implies that consumers' demands depend not only on preferences, but also on income distribution. Hence, we can investigate whether income inequality is a deterrent to CSR growth.

Under these assumptions the model alternatively admits, at equilibrium, different scenarios each characterized by a different extent of the ethical sector. The extent of each sector is given by the fraction of the total labor force employed in that sector. Preferences and the presence of two classes of income can produce four different cases: all consumers purchase ethical goods (this happens when the price of ethical goods is lower than the price of standard goods), only socially concerned consumers purchase ethical goods, only socially concerned consumers getting the share of profits purchase them, no one does it. The relation between the price of ethical goods and the two

far. Two examples in this direction are Allouch (2009) and Becchetti and Adriani (2004). In Becchetti and Adriani (2004), authors analyze a North-South model of trade, where a single consumption good is produced in the two countries. However, income distribution does not affect the equilibrium outcome in their model.

[3]This assumption is well documented in the marketing and the economics literature (see, for instance, Allenby and Rossi, 1991). Allenby and Rossi (1991) study a discrete choice model where consumers have nonhomotetic preferences over different brands of the same product. They use a model with nonconstant marginal utility which produces a system of linear but rotating indifference curves. Rotating indifference curves allow utility maximizing choice behavior to exhibit switching from low to high quality brands due to income effects.

classes of income determines which of these situations emerges.

This result is relevant because the emergence of one equilibrium rather than another influences income inequality. We find that, under plausible conditions the increase in the size of the ethical sector is associated with a reduction of inequality. In this case there exists a virtuous circle between two policy goals: the expansion of the ethical sector and the reduction of inequality. Under such conditions any policy which promotes the diffusion of CSR induces a reduction of income inequality. By contrast, when such conditions do not apply, we show that only redistributive policies can promote both a reduction of inequality and an increase in CSR diffusion.

The next section introduces the main features of the model. Section 3.3 describes the assumptions on preferences and income distribution. In Section 3.4, we investigate the equilibrium configurations of the model. In Section 3.5, we give a brief description of the dynamics. In Section 3.6, we find the circumstances under which there exists the virtuous circle. In Section 3.7 we investigate the consequences of two kinds of policies that affect preferences for ethical consumption and income distribution. Section 3.8 concludes.

3.2 A General Equilibrium Model

The economy is divided into two sectors, the standard (S) and the ethical (E). In each sector a representative firm operates. The two representative firms produce a single good with two similar technologies. The ethical sector (hereafter, E-sector) devotes a percentage $c \in (0, 1)$ of its product E to obtain an ethical certification which does not apply to the standard sector (hereafter, S-sector).[4] We denote w_E and w_S as the wage of E and S-sector respectively. In both sectors, firms maximize profits. Profits are equally shared among a quota, $\sigma \in (0, 1]$, of the labor force, L, irrespective of the sector where they work. We define γ as the quota of workers employed in the S-sector, $\gamma \equiv \frac{L_S}{L}$. Since we assume full employment in the economy, $L = L_S + L_E$, the quota

[4]As we pointed out in the introduction, ethical firms must internalize a social cost which standard firms neglect. In our model the amount of product used to obtain the ethical certification is destroyed and hence it is not redistributed to any economic agent; this implies that, at equilibrium, the demand of ethical goods D_E is equal to the net supply of ethical goods $E(1 - c)$, where E is the supply of ethical goods and cE is the share of product that is lost to internalize the social cost of certification. The intuition behind this assumption is similar to that of "iceberg" cost à la Samuelson (1954). We may also assume that the share cE is distributed to a sector whose aim is to reduce negative production externalities suffered by consumers. However such analysis would go beyond the purposes of our study, since our aim is to explain the link between income distribution and the expansion of the E-sector.

of workers employed in the E-sector $\frac{L_E}{L}$ is given by $1-\gamma$.

We assume that the production in the two sectors follows a Cobb-Douglas technology. Hence the two production functions are

$$S(\gamma) = B(\gamma L)^{\beta}, \tag{3.1}$$

where $B > 0$ and $\beta \in (0,1)$, and

$$E(\gamma) = A[(1-\gamma)L]^{\alpha}, \tag{3.2}$$

where $A > 0$ and $\alpha \in (0,1)$, in the S- and E-sectors respectively. Total profits are given by

$$\Pi = \Pi_S + \Pi_E, \tag{3.3}$$

where, given (3.1) and (3.2)

$$\Pi_S = p_S S(\gamma) - w_S \gamma L, \tag{3.4}$$

$$\Pi_E = p_E(1-c)E(\gamma) - w_E(1-\gamma)L. \tag{3.5}$$

Profit maximization implies

$$w_S = p_S S'(\gamma), \tag{3.6}$$

$$w_E = p_E(1-c)E'(\gamma), \tag{3.7}$$

where S' is $\frac{dS}{dL_S}$ and E' is $\frac{dE}{dL_E}$. We assume that labor is perfectly mobile; hence at equilibrium the wages in the two sectors must be equal, that is $w \equiv w_E = w_S$. Defining the standard commodity as numeraire, $p_S = 1$, from (3.1), (3.2), (3.6) and (3.7), we get

$$w = \beta B(\gamma L)^{\beta-1}, \tag{3.8}$$

and

$$p_E = \frac{S'(\gamma)}{(1-c)E'(\gamma)} = \frac{\beta B[(1-\gamma)L]^{1-\alpha}}{\alpha A(\gamma L)^{1-\beta}(1-c)}. \tag{3.9}$$

From equations (3.1), (3.2), (3.3), (3.8) and (3.9) we obtain:

$$\Pi = \frac{B}{\alpha}\gamma^{\beta-1}L^{\beta}\left[(1-\gamma)\beta + \alpha\gamma - \alpha\beta\right]. \tag{3.10}$$

3.3 Preferences and Income Distribution

We assume that there are two types of consumers, socially concerned and traditional. The share of socially concerned consumers is denoted by $\phi \in (0,1)$, while the share of traditional consumers is $1-\phi$. Budget constraint of both types of consumers is

$$p_E q_E + q_S \leq y, \tag{3.11}$$

where $y > 0$ is the income of each consumer.

Traditional consumers are not interested in ethical aspects of product and consider goods produced by the two sectors as perfect substitutes (as products of the same quality); the utility of traditional consumers is then given by:

$$U_T(q_E, q_S) = q_E + q_S, \tag{3.12}$$

where q_i is the quantity of the $i-$th sector demanded by each traditional consumer.

Differently from traditional consumers, socially concerned consumers consider ethical products as of higher quality and their preferences are nonhomothetic: as the attainable level of utility for the consumers increases, ethical goods are highly valued. In particular, we assume that the indifference curves of the utility function are linear and rotating in slope as the level of utility increases (see Figure 3.1):

$$q_E = \frac{u}{2} - \frac{a}{2u} q_S, \tag{3.13}$$

where $0 < a < 4 \min y$ and u is the attainable level of utility.[5] This implies that as the budget constraint shifts out, socially concerned consumers will switch from standard to ethical products rather than consuming more of standard goods (see Livraghi, 2007a; D'Alessio et al., 2007a). The utility of socially concerned consumers is given by:

[5]When $a < 4 \min y$, we have that, if $p_E \leq p_S$, $MRS_{E,S} > \frac{p_E}{p_S}$ and socially concerned consumers find it convenient to spend entirely their income in buying ethical goods. Otherwise (when $a \geq 4 \min y$) we would have the case in which, for $p_E \leq p_S$, socially concerned consumers may find it convenient to spend entirely their income in buying standard goods. As we will see throughout this section, there are two classes of income: a share $\sigma \in (0,1)$ of the population receives, besides their wages, an equal fraction θ of total profits (the income of this class of laborers is then given by $w + \theta$), while the share $1-\sigma$ receives only wage w. This implies that $\min y \equiv \min w$. By (3.8), we have that, for $\gamma = 1$, $w(\gamma)$ is minimum and is given by $w(1) = \frac{\beta B}{L^{1-\beta}}$; hence $\min y \equiv \min w = \frac{\beta B}{L^{1-\beta}}$.

$$U_{SC}(q_E, q_S) = q_E + \sqrt{q_E^2 + aq_S}. \tag{3.14}$$

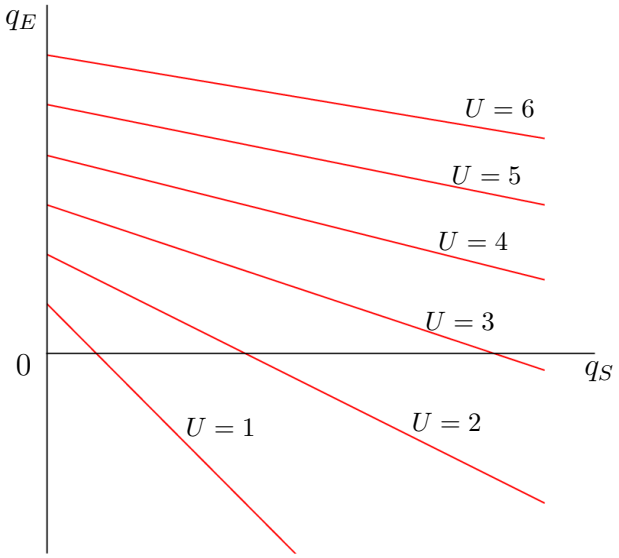


Figure 3.1: Indifference curves for socially concerned consumers when $a = 1$.

By maximizing utility of each type of consumer subject to the budget constraint we obtain their demand functions. The quantities demanded of goods S and E by each traditional consumer are

$$q_S = \begin{cases} 0, & \text{if} \quad p_E \leq 1, \\ y, & \text{if} \quad p_E > 1 \end{cases} \tag{3.15}$$

and

$$q_E = \begin{cases} y, & \text{if} \quad p_E \leq 1, \\ 0, & \text{if} \quad p_E > 1 \end{cases} \tag{3.16}$$

The quantities demanded of goods S and E by each socially concerned consumer are[6]

[6]Thanks to the condition $0 < a < 4\min(y)$, we have that $p_S = 1 < 2\sqrt{\frac{y}{a}}$ for any y.

$$q_S = \begin{cases} 0, & \text{if} \quad 0 < p_E \leq 2\sqrt{\frac{y}{a}}, \\ y, & \text{if} \quad p_E > 2\sqrt{\frac{y}{a}} \end{cases} \tag{3.17}$$

and

$$q_E = \begin{cases} \frac{y}{p_E}, & \text{if} \quad 0 < p_E \leq 2\sqrt{\frac{y}{a}}, \\ 0, & \text{if} \quad p_E > 2\sqrt{\frac{y}{a}} \end{cases} \tag{3.18}$$

To define the aggregate demand functions for the two sectors we need to introduce income distribution. In particular, we assume that a share of the population $\sigma \in (0,1)$ receive, besides their wages, an equal fraction θ of total profits[7]. From equation (3.10):

$$\theta \equiv \frac{\Pi}{\sigma L} = \frac{B}{\alpha\sigma}(\gamma L)^{\beta-1}\left[(1-\gamma)\beta + \alpha\gamma - \alpha\beta\right], \tag{3.19}$$

A share $(1-\sigma)$ of the labor force receives only wages. For the sake of argument, both workers employed in the S- and the E-sectors may receive a share of profits. Since $w_E = w_S$, we obtain only two different income classes: $(1-\sigma)L$ workers gets w, while σL gets $w+\theta$ independently of the sector where they work. This implies that the aggregate demand functions in the two sectors are given by

$$D_S = \begin{cases} 0 & \text{if} \quad 0 < p_E \leq 1, \\ (1-\phi)(w+\sigma\theta)L & \text{if} \quad 1 < p_E \leq \underline{\Psi}, \\ (w+\sigma\theta)L - \phi\sigma(w+\theta)L & \text{if} \quad \underline{\Psi} < p_E \leq \overline{\Psi}, \\ (w+\sigma\theta)L & \text{if} \quad p_E > \overline{\Psi} \end{cases} \tag{3.20}$$

and

$$D_E = \begin{cases} \frac{(w+\sigma\theta)L}{p_E} & \text{if} \quad 0 < p_E \leq 1, \\ \frac{\phi}{p_E}(w+\sigma\theta)L & \text{if} \quad 1 < p_E \leq \underline{\Psi}, \\ \phi\sigma\frac{(w+\theta)L}{p_E} & \text{if} \quad \underline{\Psi} < p_E \leq \overline{\Psi}, \\ 0 & \text{if} \quad p_E > \overline{\Psi} \end{cases} \tag{3.21}$$

where $\underline{\Psi} \equiv 2\sqrt{\frac{w}{a}}$ and $\overline{\Psi} \equiv 2\sqrt{\frac{w+\theta}{a}}$, with $p_S = 1 < \underline{\Psi} < \overline{\Psi}$.

[7] A similar assumption on income distribution is in Bilancini and D'Alessandro (2008).

3.4 Excess demand and equilibria

At equilibrium a vector of prices $\mathbf{p}^* = \{p_S^*, p_E^*\}$ ensures that demand and supply in each sector are equalized, i.e. $D_S = S(\gamma)$ and $D_E = (1-c)E(\gamma)$.[8] Since $\frac{\partial p_E(\gamma)}{\partial \gamma} < 0$, $\forall \gamma \in [0,1]$, in order to study the features of the equilibria, we can focus on the share of workers employed in the S-sector (γ), which indirectly measures the degree of the E-sector development.

In the S-sector, from equations (3.8), (3.10), (3.20) and (3.19), we can define D_S as a function of γ[9]:

$$D_S(\gamma) = \begin{cases} D_{S1}(\gamma) & \text{if} \quad 0 < p_E(\gamma) \leq 1, \\ D_{S2}(\gamma) & \text{if} \quad 1 < p_E(\gamma) \leq \underline{\Psi}(\gamma), \\ D_{S3}(\gamma) & \text{if} \quad \underline{\Psi}(\gamma) < p_E(\gamma) \leq \overline{\Psi}(\gamma), \\ D_{S4}(\gamma) & \text{if} \quad p_E(\gamma) > \overline{\Psi}(\gamma); \end{cases} \tag{3.22}$$

where

$$D_{S1}(\gamma) = 0; \tag{3.23}$$

$$D_{S2}(\gamma) = (1-\phi) f(\gamma) \left[\beta + \gamma(\alpha - \beta)\right]; \tag{3.24}$$

$$D_{S3}(\gamma) = D_{S2}(\gamma) + f(\gamma)\alpha\beta\phi(1-\sigma); \tag{3.25}$$

$$D_{S4}(\gamma) = f(\gamma) \left[\beta + \gamma(\alpha - \beta)\right]; \tag{3.26}$$

and $f(\gamma) = \frac{S' L}{\alpha\beta} = \frac{B L^\beta}{\alpha \gamma^{1-\beta}}$. Furthermore, it is easy to prove that

$$\frac{\partial D_{Si}(\gamma)}{\partial \gamma} \leq 0, \quad \forall \gamma \in [0,1] \tag{3.27}$$

with $i = 1, 2, 3, 4$. The sign of the derivative of D_{Si} is important in the description of the system dynamics (see Section 3.5).

Let us define $Z(\gamma) = D_S(\gamma) - S(\gamma)$ as the excess demand function in the S-sector. Given the shape of the demand function, $Z(\gamma)$ is a piecewise continuous function

$$Z(\gamma) = \begin{cases} Z_1(\gamma) & \text{if} \quad 0 < p_E(\gamma) \leq 1, \\ Z_2(\gamma) & \text{if} \quad 1 < p_E(\gamma) \leq \underline{\Psi}(\gamma), \\ Z_3(\gamma) & \text{if} \quad \underline{\Psi}(\gamma) < p_E(\gamma) \leq \overline{\Psi}(\gamma), \\ Z_4(\gamma) & \text{if} \quad p_E(\gamma) > \overline{\Psi}(\gamma); \end{cases} \tag{3.28}$$

[8] The term cE measures the fraction of any unit of product which is "lost" to internalize the certification cost c. Hence $(1-c)E(\gamma)$ is the *net* supply in the ethical sector.

[9] Since labor market is, at equilibrium, the condition $D_S = S(\gamma)$ ensures that also the E-market is at equilibrium.

where $Z_j(\gamma) = D_{S_j}(\gamma) - S(\gamma)$ with $j = 1, 2, 3, 4$, and $Z_1(\gamma) \leq Z_2(\gamma) \leq Z_3(\gamma) \leq Z_4(\gamma)$ $\forall\gamma$. The market clears if $Z(\gamma) = 0$. Each $Z_j(\gamma)$ is equal to zero for the following values of γ:

$$\gamma^*_{Z_1} = 0; \tag{3.29}$$

$$\gamma^*_{Z_2} = \frac{\beta(1-\phi)}{\alpha\phi + (1-\phi)\beta}; \tag{3.30}$$

$$\gamma^*_{Z_3} = \frac{\alpha\beta\phi(1-\sigma) + \beta(1-\phi)}{\alpha\phi + \beta(1-\phi)}; \tag{3.31}$$

$$\gamma^*_{Z_4} = 1. \tag{3.32}$$

Hence, $\gamma^*_{Z_1}$ is an *equilibrium* if and only if $p_E(\gamma^*_{Z_1}) \leq 1$, $\gamma^*_{Z_2}$ if and only if $1 < p_E(\gamma^*_{Z_2}) \leq \underline{\Psi}(\gamma^*_{Z_2})$, $\gamma^*_{Z_3}$ if and only if $\underline{\Psi}(\gamma^*_{Z_3}) < p_E(\gamma^*_{Z_3}) \leq \overline{\Psi}(\gamma^*_{Z_3})$, and $\gamma^*_{Z_4}$ if and only if $p_E(\gamma^*_{Z_4}) > \overline{\Psi}(\gamma^*_{Z_4})$. From (3.29), (3.30), (3.31) and (3.32), it follows that $0 \leq \gamma^*_{Z_1} \leq \gamma^*_{Z_2} \leq \gamma^*_{Z_3} \leq \gamma^*_{Z_4}$. Moreover, it is easy to verify that

(a) $\gamma^*_{Z_1}$ can never be an equilibrium since, for $\gamma = \gamma^*_{Z_1}$, it is $p_E(\gamma) \to +\infty$ and hence condition $p_E(\gamma^*_{Z_1}) \leq 1$ is never satisfied;

(b) $\gamma^*_{Z_4}$ can never be an equilibrium since, for $\gamma = \gamma^*_{Z_4}$, it is $p_E(\gamma) \to 0$ and hence condition $p_E(\gamma^*_{Z_4}) > \overline{\Psi}(\gamma^*_{Z_4})$ is never satisfied since $\overline{\Psi}(\gamma^*_{Z_4}) > 0$.

A numerical illustration of the model is represented in Figure 3.2. The first graph shows the curves $p_E(\gamma)$, $p_S = 1$, $\underline{\Psi}(\gamma)$ and $\overline{\Psi}(\gamma)$. The second graph displays the excess demand function in the S-sector, which is denoted by the thickest curve $Z(\gamma)$. The lowest curve $Z_1(\gamma)$ shows the case in which all the consumers purchase the ethical good, $p_E < 1$, curve $Z_2(\gamma)$ the case in which all socially concerned consumers purchase the ethical good, $1 < p_E(\gamma) \leq \underline{\Psi}(\gamma)$, curve $Z_3(\gamma)$ the case in which only the socially concerned consumers who get the share of profits, θ, purchase the ethical good, $\underline{\Psi}(\gamma) < p_E(\gamma) \leq \overline{\Psi}(\gamma)$, while the highest curve $Z_4(\gamma)$ the case in which no one purchases it, $p_E(\gamma) > \overline{\Psi}(\gamma)$. In the interval $[0, \breve{\gamma}]$ the excess demand function assumes the value $Z_4(\gamma)$ (since $p_E(\gamma) \leq \overline{\Psi}(\gamma)$); in the interval $(\breve{\gamma}, \bar{\gamma}]$ the excess demand function assumes the value $Z_3(\gamma)$ (since $\underline{\Psi}(\gamma) < p_E(\gamma) \leq \overline{\Psi}(\gamma)$); between $(\bar{\gamma}, \bar{\bar{\gamma}}]$ the value $Z_2(\gamma)$ (since $1 < p_E(\gamma) \leq \underline{\Psi}(\gamma)$); between $(\bar{\bar{\gamma}}, 1]$ the value $Z_1(\gamma)$ (since $p_E \leq 1$). In this example the model admits one equilibrium: $\gamma^*_{Z_3}$.

Figure 3.3 is a numeral illustration in which the equilibrium is $\gamma^*_{Z_2}$, while, Figure 3.4 shows the case in which there exists a stable limit cycle. A stable

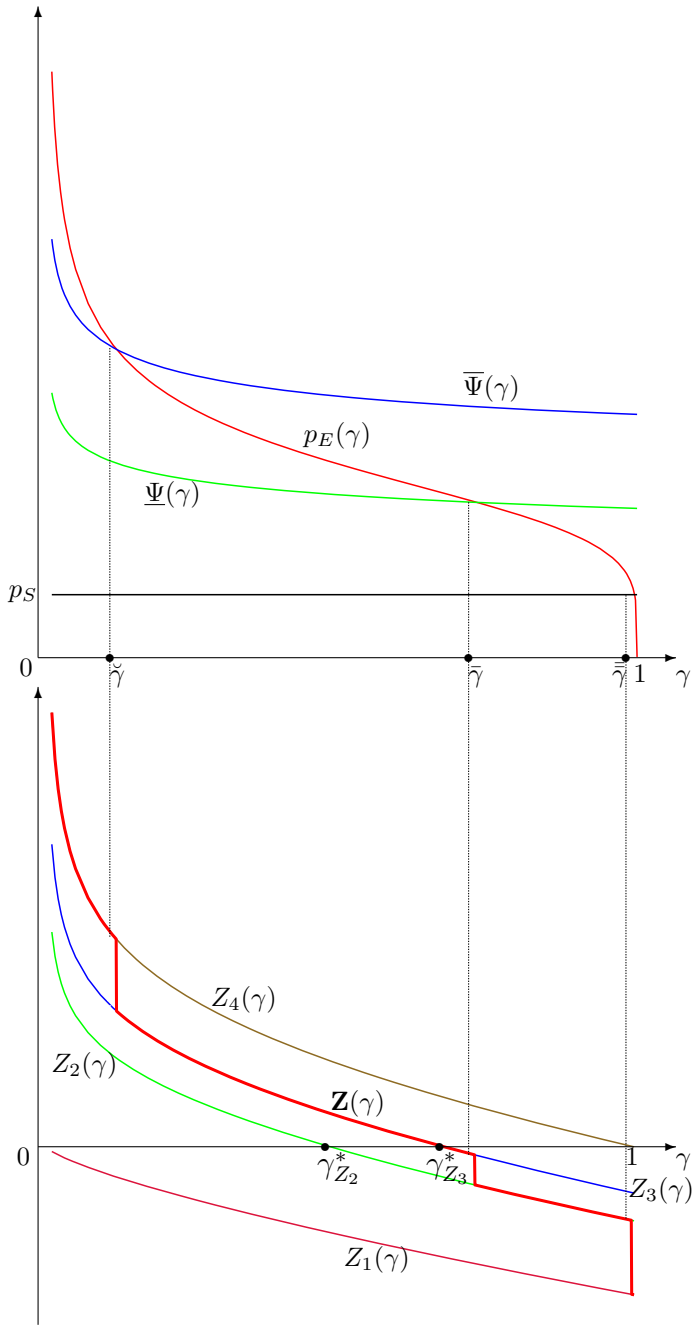


Figure 3.2: The first picture shows the graph of $p_E(\gamma)$, $p_S = 1$, $\underline{\Psi}(\gamma)$ and $\overline{\Psi}(\gamma)$. The interceptions between p_E and $\underline{\Psi}$ or $\overline{\Psi}$ or $p_S = 1$ determine the intervals of the excess demand function. The second picture shows the graph of the excess demand function – i.e. the thickest piecewise curve. Values of parameters are: $c = 0.25$, $\phi = 0.5$, $\sigma = 0.5$, $a = 1$, $\alpha = 0.8$, $\beta = 0.75$, $B = 6$, $A = 2$, $L = 100$.

limit cycle exists if and only if, given $\gamma_1, \gamma_2 \in [0,1]$ and $\gamma_2 = \gamma_1 + \epsilon$, $\forall$ arbitrarily small $\epsilon > 0$, it holds that

i. $Z(\gamma_1) = Z_i(\gamma_1)$ and $Z(\gamma_2) = Z_j(\gamma_1)$, with $i > j$;

ii. $Z(\gamma_1) > 0$ and $Z(\gamma_2) < 0$.

Figure 3.4 clarify this result. In γ^{**} the excess demand function jumps from a positive to a negative value. Although prices do not clear the markets, market forces tend to keep the relative extent of the two sectors around γ^{**} – i.e. γ^{**} is a stable limit cycle.[10]

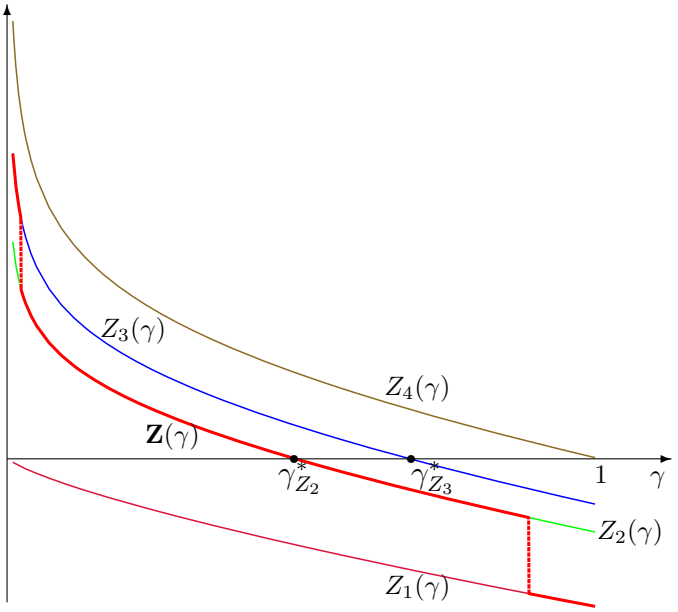


Figure 3.3: Graph of the excess demand function. A stable equilibrium on $Z_2(\gamma)$. Values of parameters: $c = 0.15$, $\phi = 0.5$, $\sigma = 0.5$, $a = 1$, $\alpha = 0.8$, $\beta = 0.75$, $B = 6$, $A = 3.5$, $L = 100$.

We summarize our findings in the following Proposition.

Proposition 3.4.1 *The model always admits either an equilibrium or a stable limit cycle.*

[10] In order to better explain this result, the dynamics of the system must be introduced. This is discussed in the next section.

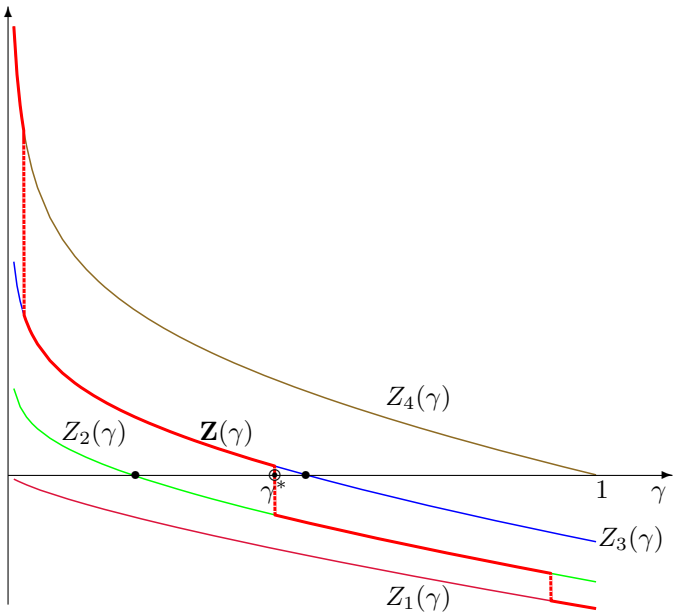


Figure 3.4: Graph of the excess demand function. The double circle indicates the limit cycle. Values of parameters: $c = 0.15$, $\phi = 0.8$, $\sigma = 0.5$, $a = 1$, $\alpha = 0.7$, $\beta = 0.75$, $B = 4$, $A = 3$, $L = 100$.

Proof In our model, any $Z_i(\gamma)$, for $i = 1, 2, 3, 4$, is a decreasing function of γ, $Z(0) \geq 0$, $Z(1) \leq 0$, and the excess demand function is always defined in all its domain. Given these properties, we have the following results. There always exists either an equilibrium or a stable limit cycle, since otherwise there is no way to obtain $Z(1) \leq 0$ starting from $Z(0) \geq 0$.

It is easy to prove that when either $\alpha \geq \beta$ or $\alpha < \beta$ and $\alpha \leq \frac{1}{2}$, there exists only one intersection between curves $\underline{\Psi}(\gamma)$ and $p_E(\gamma)$, and between $\overline{\Psi}(\gamma)$ and $p_E(\gamma)$; this implies that the model admits only one equilibrium (see Figures 3.2 and 3.3) or a stable limit cycle (see Figure 3.4); otherwise, curves $\overline{\Psi}(\gamma)$ and $p_E(\gamma)$ might intersect either one or three times, and, in principle, the model may admit the existence of both an equilibrium and a stable limit cycle.[11] Hence, the existence of multiple equilibria is excluded.

[11]The equilibrium that emerges can be either $\gamma^*_{Z_2}$ or $\gamma^*_{Z_3}$. In our numerical simulations three intersections between curves p_E and $\overline{\Psi}$ only emerge when β is very close to 1. This means that curves Z_3 and Z_4 are very close to each other. In such a case, $\gamma^*_{Z_3}$ is close to one, and it is not possible to obtain one equilibrium and a limit cycle.

3.5 Dynamics

Let us assume that at a certain instant $\gamma = \gamma_0$ and $Z(\gamma_0) > 0$, i.e. there is an excess of demand in the S-sector and an excess of supply in the E-sector. Since we defined the standard commodity as numeraire, market forces tend to reduce the relative price of the ethical goods, i.e. p_E decreases. Since the price of the E-sector is decreasing in γ, the reduction in p_E induces an increase in γ. The change in γ modifies the distribution in the economy. However, from inequality (3.27), an increase in γ implies a decrease in the demand of the S-sector. Hence, as expected, the reduction in the price of ethical goods induces an increase in the demand of the E-sector. This adjustment process continues until the relative price of ethical goods is such that $Z(\gamma) = 0$.

In other words, the univocal relation between p_E and γ allows us to consider the dynamics of the model in terms of $Z(\gamma)$ and γ. We capture the movement of the system through the following dynamics:

$$\dot{\gamma}_t = h(Z(\gamma_t)), \tag{3.33}$$

where t is the time index, $\dot{\gamma}_t \equiv \frac{d\gamma_t}{dt}$, $\frac{dh(Z)}{dZ} > 0$, and $\dot{\gamma}_t = 0 \Leftrightarrow h(0) = 0$, that is when the economy is at equilibrium. As we pointed out in Section 3.4, the model can admit two different equilibrium configurations[12], hence initial conditions determine which equilibrium arises. Internal equilibrium, if it exists, is always locally stable since the derivative of each excess demand function with respect to γ is always negative (see inequality (3.27)).

The basin of attraction of any equilibrium for $\gamma \in [0, 1]$ is given by the interval defined by the maximum γ in which $Z(\gamma) < 0$ for any $\gamma < \gamma^*_{Z_i}$; and by the minimum γ in which $Z(\gamma) > 0$ for any $\gamma > \gamma^*_{Z_i}$. If these two values do not exist, the boundaries are $\gamma = 0$ and $\gamma = 1$ respectively. For instance, in Figures 3.2 and 3.3 the basin of attraction of the equilibrium is always defined by the interval $[0, 1]$. A different basin of attraction can emerge only when both an equilibrium and a stable limit cycle exist.

Figure 3.4 shows the phase diagram of the model with the presence of a stable limit cycle around γ^{**} – marked with a double circle. On the left of γ^{**} there is an excess of demand in the S-sector, hence γ tends to increase. By contrast, on its right side there is an excess of supply, hence γ tends to decrease. This dynamics generates a stable limit cycle.

[12] $\gamma^*_{Z_2}$ and $\gamma^*_{Z_3}$.

3.6 CSR growth and Income Inequality

Expansion of the E-sector affects income inequality in the economy since to different values of γ different levels of wage and total profits are associated – see equations (3.8) and (3.10). This issue is relevant because i) the emergence of either $\gamma^*_{Z_2}$ or $\gamma^*_{Z_3}$ as equilibrium affects the degree of inequality in the economy; ii) policies on preferences and income distribution shape the demand in the two sectors, moving the equilibrium.

We define as *virtuous circle* a trajectory of γ which associates an expansion of the E-sector (a reduction of γ) to a reduction of income inequality and viceversa. A central question of this chapter is to study under what conditions the described virtuous circle emerges. In order to investigate this issue, in Appendix 3.9.1 we compute the Gini Index for this economy, $G(\gamma)$, as an index of income inequality.[13] Then it holds that

$$G(\gamma) = \frac{1-\sigma}{2}\left(1 - \frac{\alpha\beta}{L[\beta + \gamma(\alpha - \beta)]}\right). \tag{3.34}$$

Proposition 3.6.1 presents the results on the relation between the Gini Index and γ.

Proposition 3.6.1 *If $\alpha > \beta$, then $\frac{\partial G(\gamma)}{\partial \gamma} > 0$, for any $\gamma \in [0,1]$. Otherwise, $\frac{\partial G(\gamma)}{\partial \gamma} \leq 0$, for any $\gamma \in [0,1]$.*

Proof From equation (3.34), it holds that

$$\frac{\partial G(\gamma)}{\partial \gamma} = \frac{(1-\sigma)\alpha\beta(\alpha - \beta)}{2L[\beta + \gamma(\alpha - \beta)]^2} \tag{3.35}$$

This derivative is positive for $\alpha > \beta$, while it is non-positive otherwise.

When the derivative of the Gini Index with respect to γ is positive, any expansion of the E-sector – that is a reduction in γ – reduces inequality in the economy. Proposition 3.6.1 proves that this result holds if and only if the share of product going to workers in the E-sector is higher than the corresponding share in the S-sector, that is $\alpha > \beta$.[14]

For instance, in Figures 3.2 and 3.3, $\alpha > \beta$. Hence given Proposition 3.6.1 starting from a small E-sector (γ close to 1), its expansion (driven by

[13] As is well known, the Gini Index is an increasing function of income inequality. In particular when $G(\gamma) = 0$, the inequality is minimal (all consumers have the same income), while when $G(\gamma) = 1$, the inequality is greatest.

[14] It seems reasonable that in real economies the share of product going to profits is lower in the E-sector than in the standard one, since the respect of criteria, especially labor ones, can easily induce a reduction in the share of profits.

the dynamics of the model) induces a reduction of income inequality: that is a virtuous circle. In Figure 3.4 instead $\alpha < \beta$ and hence to a reduction of γ is associated more inequality. Moreover, depending on which equilibrium arises, the model generates qualitatively different scenarios. For instance, in Figure 3.3, the increase in the E-sector is significantly higher than that in Figure 3.2 (since $\gamma^*_{Z2} < \gamma^*_{Z_3}$) and hence also the associated reduction of income inequality is higher in case of Figure 3.3 than that of Figure 3.2. Through distributional and preference levers policy makers may shape the demand in the two sectors, shifting the equilibrium. In the next section we investigate the impact of such policies on the two goals: reduction of inequality and expansion of the ethical sector; that is on the building of a virtuous circle.

3.7 Policy Implications

We concentrate our analysis on two kinds of policies that affect preferences – through ϕ – and income distribution – through parameter σ.[15] The model shows the following two properties:

a) Parameter ϕ does not influence $\underline{\Psi}$, $\overline{\Psi}$ and p_E. Hence the values of γ at which the excess demand function is discontinuous do not vary through changes in ϕ. By contrast, ϕ influences Z_2 and Z_3 with $\frac{dZ_2}{d\phi} < \frac{dZ_3}{d\phi} < \frac{dZ_4}{d\phi} = \frac{dZ_1}{d\phi} = 0$. Hence an increase in ϕ induces a lower value of $\gamma^*_{Z_2}$ and $\gamma^*_{Z_3}$.[16]

b) Parameter σ influences $\overline{\Psi}$ with $\frac{d(\overline{\Psi})}{d\sigma} < 0$. This implies that intervals of γ in which Z takes values of Z_3 and Z_4 can be influenced by σ. This happens when $\overline{\Psi}$ intersects p_E. Moreover, σ influences Z_3 with $\frac{dZ_3}{d\sigma} < 0 = \frac{dZ_1}{d\sigma} = \frac{dZ_2}{d\sigma} = \frac{dZ_4}{d\sigma}$. Hence an increase in σ induces a lower value of $\gamma^*_{Z_3}$.

Let us assume that the economy is at equilibrium $\gamma^*_{Z_2}$ or $\gamma^*_{Z_3}$ and policy makers induce an increase in ϕ. This change always causes an expansion of the ethical sector. Indeed, the S-sector switches from an equilibrium position to an excess of supply. This in turns leads to a reduction in γ^* and the extent of the E-sector increases (see Property "a" above). Finally if the economy is

[15] There are other parameters which may affect income distribution (e.g. α and β) and the behavior of consumers. However, given our framework σ and ϕ generate more interesting results and can be easily influenced by policy makers.

[16] As we pointed out in Section 3.4, each $\gamma^*_{Z_j}$ $(j = 2, 3)$ may not be an equilibrium. However, this result applies both when $\gamma^*_{Z_j}$ is and is not an equilibrium.

at a stable limit cycle, the effects of an increase in ϕ can produce different results whether the limit cycle is between Z_4 and Z_3 or between Z_3 and Z_2 (or between Z_2 and Z_1). Indeed, while in the first case policy makers cannot induce any change (since Z_4 is fixed), in the other two cases the increase in ϕ may induce the S-sector to switch from an excess of demand to an excess of supply. Hence, the limit cycle disappears and the E-sector increases.

Differently from ϕ, σ does not affect preferences but may affect consumers' behavior through changes in income distribution. For instance, an increase in σ reduces the income of consumers receiving the share of profits, but increase their number. As we pointed out in Property "b", this implies that both $\overline{\Psi}$ and the excess demand function Z_3 shift downward. Hence, if the economy is at equilibrium $\gamma^*_{Z_2}$, a change in σ has no consequences. If instead the economy is at equilibrium $\gamma^*_{Z_3}$, the increase in σ implies an increase in the E-sector if, at equilibrium, the class of richest ethical consumer still purchase the ethical good. Otherwise, i.e. after the change in σ, equilibrium $\gamma^*_{Z_3}$ disappears, a stable limit cycle between Z_3 and Z_4 takes place and the size of the E-sector decreases since a lower number of consumers purchase the ethical good. The opposite applies when σ decreases. Finally, if the economy lies in a limit cycle between Z_3 and Z_2, the increase in σ has the same effect as an increase in ϕ.

Changes in the relative sizes of the two sectors affect the level of inequality in the economy. We can characterize the effect of changes of ϕ and σ on the Gini index derived in the previous section. Parameter ϕ does not directly affect $G(\gamma)$, see equation (3.34). However, as analyzed above, changes in ϕ can affect the extent of the E-sector, and hence through γ the level of inequality. By Proposition 3.6.1, we prove that for $\alpha > \beta$, policies on preferences that increase the extent of the E-sector result in a reduction of inequality. Otherwise, policies on preferences that increase the extent of the E-sector result in an increase of inequality. In other words, when the share of product going to workers in the E-sector is greater than that in the S-sector, policies which induce an expansion of ethical sector also lead to a reduction of inequality, i.e. policies produce a virtuous circle.

Parameters σ directly enter the Gini Index. Without considering the effect of σ on γ, an increase in σ induces a reduction in the Gini Index, see equation (3.34). However, as analyzed above, changes in σ can also affect the extent of the E-sector. The effect of γ on $G(\gamma)$ is given by Proposition 3.6.1. Hence, if $\alpha > \beta$ policies that increase the extent of the E-sector, through an increase in σ, also reduce income inequality, i.e. they produce a virtuous circle. If instead $\alpha < \beta$, while the increase in σ tends to reduce income inequality, the increase in the E-sector goes in the opposite direction. Hence, the dominant effect determines whether the inequality decreases, and hence

whether redistributive policies result in an expansion of E-sector. We found that redistributive policies can generate a virtuous circle even if $\alpha < \beta$. As an example, Appendix 3.9.2 shows that this result holds for a wide range of parameters when the economy lies at the equilibrium $\gamma^*_{Z_3}$.

Finally, the increase in the E-sector may be due to a reduction of σ. In this case, the effects of policies on σ and on the expansion of the ethical sector work in the opposite directions to those illustrated above.[17]

3.8 Concluding Remarks

We introduced CSR differentiation in a general equilibrium model. The main novelty was the analysis of the role of income distribution in CSR growth. We made two assumptions: i) socially concerned consumers do not purchase *ethical* goods below a threshold level of attainable utility, while, over this threshold, they switch from standard to ethical products (rather than consuming more of standard products) and they totally spends their income in the CSR sector; ii) there are only two classes of income, since profits are equally distributed among a fraction of the labor force. The model admits one single equilibrium. Depending on the values of parameters two alternative equilibrium configurations may arise, each characterized by a different size of the E-sector. Different hypotheses generate different scenarios but do not change the finding that income inequality is a deterrent to the diffusion of CSR. In our set-up, we found that when the share of product going to workers is higher in the ethical sector than in the standard one, there is a virtuous circle which ties CSR growth to inequality reduction. In this case, any policy which increases the demand for ethical commodities results in a reduction of inequality. Otherwise, only redistributive policies can generate the virtuous circle between those two policy targets. This result holds for a wide range of parameters.

The Lisbon Strategy identifies in CSR diffusion a valuable instrument for European development. Our contribution argued that income distribution and CSR cannot be independently analyzed.

[17] That is, when $\alpha > \beta$ changes in σ and γ conflictingly affect the Gini Index while, when $\alpha < \beta$ they work in the same direction.

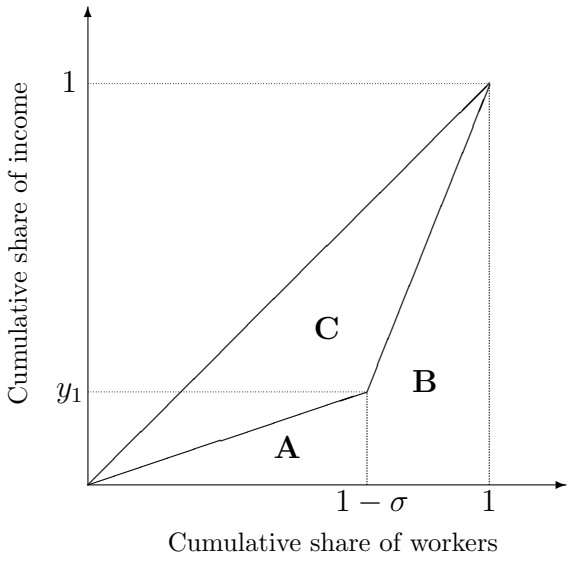
3.9 Appendixes

3.9.1 The Gini Index

The Gini Index is defined as the ratio of the area that lies between the line of equality and the Lorenz curve (marked **C** in Figure 3.9.1) to the total area under the line of equality (the sum of areas **A**, **B** and **C** in Figure 3.9.1), i.e. the Gini Index, $G(\gamma)$ is given by the ratio $\frac{\mathbf{C}}{\mathbf{A}+\mathbf{B}+\mathbf{C}}$. Since in our model there are only two classes of income, the Lorenz curve drawn in Figure 3.9.1 is given by two segments of different shapes: in relative terms, $\frac{w}{y}$ for the share of poorest workers and $\frac{w+\theta}{y}$ for the share of richest ones, where y is the average per capita income, i.e. $y = w + \frac{\Pi}{L}$. The share of workers which does not receive profits is $1-\sigma$. Hence their cumulative income expressed in the vertical axis is $y_1 = \frac{w}{Y}(1-\sigma)$. By determining the areas **A**, **B** and **C**, it holds that

$$G(\gamma) = \frac{1-\sigma}{2}\left(1 - \frac{\alpha\beta}{L[\beta+\gamma(\alpha-\beta)]}\right). \tag{3.36}$$

From equations (3.8), (3.19) and (3.36), we get equation (3.34) of Section 3.6.



3.9.2 Policies and virtuous circle

Let us assume that the economy is located in $\gamma^*_{Z_3}$ and $L = 1$.[18] From (3.34), it results that σ influences directly both the Gini Index and $\gamma^*_{Z_3}$. Hence, to obtain the full effect of σ on the Gini Index, we substitute $\gamma^*_{Z_3}$ in $G(\gamma)$ and we compute the derivative $\frac{\partial G(\gamma^*_{Z_3})}{\partial \sigma}$:

$$\frac{\partial G(\gamma^*_{Z_3})}{\partial \sigma} = \frac{A\sigma^2 + B\sigma + C}{[1 - \phi(\alpha - \beta)(1 - \sigma)]^2}, \tag{3.37}$$

where

$$A = -\phi^2(\alpha - \beta)^2 < 0, \tag{3.38}$$

$$B = 2\phi(\alpha - \beta)[1 + \phi(\alpha - \beta)] \tag{3.39}$$

and

$$C = \beta - 1 - \phi(\alpha - \beta)[1 + \phi(\alpha - \beta)]. \tag{3.40}$$

From (3.37), it holds that $\frac{\partial G(\gamma^*_{Z_3})}{\partial \sigma} > 0$ if and only if $A\sigma^2 + B\sigma + C > 0$ and $\frac{\partial G(\gamma^*_{Z_3})}{\partial \sigma} < 0$ otherwise. The numerator of (3.37) is a second-order polynomial which can be represented by a concave parabola – see (3.38) – whose roots are

$$\sigma_1 = \frac{\phi(\alpha - \beta) + 1 + \sqrt{\Delta}}{\phi(\alpha - \beta)} \tag{3.41}$$

and

$$\sigma_2 = \frac{\phi(\alpha - \beta) + 1 - \sqrt{\Delta}}{\phi(\alpha - \beta)}, \tag{3.42}$$

with $\Delta \equiv B^2 - 4AC = \phi(\alpha - \beta) + \beta > 0$ for any value of α, β and ϕ.

When $\alpha > \beta$, $\sigma_1 > \sigma 2 > 1$ and hence $A\sigma^2 + B\sigma + C < 0$ for any $\sigma \in [0, 1]$. Therefore, $\frac{\partial G(\gamma^*_{Z_3})}{\partial \sigma} < 0$. If instead $\alpha < \beta$, $\sigma_1 < 0$ and the sign of σ_2 depends on α, β and ϕ. In particular:

- If $\beta < \frac{3}{4}$ for any $\alpha \in [0, 1]$, $\sigma_1 < \sigma_2 < 0$. Hence $A\sigma^2 + B\sigma + C < 0$ for any $\sigma \in [0, 1]$ and $\frac{\partial G(\gamma^*_{Z_3})}{\partial \sigma} < 0$.
- If $\frac{3}{4} < \beta < 1 + \alpha - \sqrt{\alpha}$ and $\frac{1}{4} < \alpha < 1$, $\sigma_1 < \sigma_2 < 0$. Hence $A\sigma^2 + B\sigma + C < 0$ for any $\sigma \in [0, 1]$ and $\frac{\partial G(\gamma^*_{Z_3})}{\partial \sigma} < 0$.
- If $\frac{3}{4} < \beta < 1 + \alpha - \sqrt{\alpha}$ and $\alpha < \frac{1}{4}$, $\sigma_1 < \sigma_2 < 0$ for $\phi < \frac{-1+\sqrt{-3+4\beta}}{2(\alpha-\beta)}$ or $\phi > \frac{-1-\sqrt{-3+4\beta}}{2(\alpha-\beta)}$, and $0 < \sigma_2 < 1$ for $\frac{-1+\sqrt{-3+4\beta}}{2(\alpha-\beta)} < \phi < \frac{-1-\sqrt{-3+4\beta}}{2(\alpha-\beta)}$.

[18] This assumption is made to simplify the analysis and do not modify results.

Hence, if $\phi < \frac{-1+\sqrt{-3+4\beta}}{2(\alpha-\beta)}$ or $\phi > \frac{-1-\sqrt{-3+4\beta}}{2(\alpha-\beta)}$, $\frac{\partial G(\gamma^*_{Z_3})}{\partial \sigma} < 0$ for any $\sigma \in [0,1]$, while, for $\frac{-1+\sqrt{-3+4\beta}}{2(\alpha-\beta)} < \phi < \frac{-1-\sqrt{-3+4\beta}}{2(\alpha-\beta)}$, $\frac{\partial G(\gamma^*_{Z_3})}{\partial \sigma} < 0$ if and only if $\sigma_2 < \sigma < 1$, and $\frac{\partial G(\gamma^*_{Z_3})}{\partial \sigma} > 0$ if and only if $0 < \sigma < \sigma_2$.

- If $1 + \alpha - \sqrt{\alpha} < \beta < 1$, $\alpha < \frac{1}{4}$ and $\alpha > \frac{1}{2}$, then $\sigma_1 < \sigma_2 < 0$ for $0 < \phi < \frac{-1+\sqrt{-3+4\beta}}{2(\alpha-\beta)}$, and $0 < \sigma_2 < 1$ for $\frac{-1+\sqrt{-3+4\beta}}{2(\alpha-\beta)} < \phi < 1$. Hence, if $0 < \phi < \frac{-1+\sqrt{-3+4\beta}}{2(\alpha-\beta)}$, $\frac{\partial G(\gamma^*_{Z_3})}{\partial \sigma} < 0$ for any $\sigma \in [0,1]$, while, for $\frac{-1+\sqrt{-3+4\beta}}{2(\alpha-\beta)} < \phi < 1$, $\frac{\partial G(\gamma^*_{Z_3})}{\partial \sigma} < 0$ if and only if $\sigma_2 < \sigma < 1$, and $\frac{\partial G(\gamma^*_{Z_3})}{\partial \sigma} > 0$ if and only if $0 < \sigma < \sigma_2$.
- Finally, if $1 + \alpha - \sqrt{\alpha} < \beta < 1$, $\frac{1}{4} < \alpha < \frac{1}{2}$, then results on Gini are identical to the case $\frac{3}{4} < \beta < 1 + \alpha - \sqrt{\alpha}$ and $\alpha < \frac{1}{4}$.

Bibliography

Allenby, G. M. and P. E. Rossi (1991). "Quality Perceptions and asymmetric switching between brands". *Marketing Science 10*(3), 185–204.

Allouch, N. (2009). "A Competitive Equilibrium for A Warm Glow Economy". *Working Paper No. 641, April 2009, Queen Mary University of London*.

Alves, C. and L. Santos-Pinto (2008). "A Theory of Corporate Social Responsibility in Oligopolistic Markets". *Working Paper, Université de Lausanne, Faculté des HPC, DEEP*.

Amacher, G. S., E. Koskela, and M. Ollikainen (2004). "Environmental quality competition and eco-labeling". *Journal of Environmental Economics and Management 47*, 284–306.

Andreoni, J. (1990). "Impure Altruism and Donations to Public Goods: A Theory of Warm-Glow Giving". *The Economic Journal 100*(401), 464–477.

Arora, S. and S. Gangopadhyay (1995). "Toward a theoretical model of voluntary overcompliance". *Journal of Economic Behavior & Organization 28*, 289–309.

Arrow, K. J. (1973). "Social Responsibility and Economic Efficiency". *Public Policy 21*, 303–318.

Bagnoli, M. and S. G. Watts (2003). "Selling to Socially Responsible Consumers: Competition and the Private Provision of Pubblic Goods". *The Journal of Economics & Management Strategy 12*(3), 419–445.

Baron, D. P. (2002). "Private Politics and Private Policy: A Theory of Boycotts". *Research Paper Series, Stanford Graduate School of Business*.

Becchetti, L. and F. Adriani (2004). "Fair Trade: A 'Third Generation' Welfare Mechanism to Make Globalization Sustainable". *CEIS Research Paper – Tor Vegata University, 62*.

Becchetti, L. and N. Solferino (2003). "On ethical product differentiation". *CEIS Working Paper Series*.

Becker, G. (2005). "Do Corporations Have a Social Responsibility Beyond Stockholder Value?". *The Becker-Posner Blog*.

Besley, T. and M. Ghatak (2007). "Retailing public goods: The Economics of Corporate Social Responsibility". *The Journal of Public Economics 91*(9).

Bilancini, E. and S. D'Alessandro (2008). "Functional Distribution, Land Ownership and Industrial Takeoff: the role of Efeective Demand". *B. E. Journal of Economic Analysis and Policy 8*(1).

Bjorner, B. T., L. G. Hansen, and C. S. Russell (2004). "Environmental Labeling and Consumers's Choice – an Empirical Analysis of the Effect of the Nordic Swan". *Journal of Environmental Economics and Management 47*, 411–434.

Campbell, D., G. Moore, and M. Metzger (2002). "Corporate Philanthropy in the UK 1985-2001: Some Empirical Findings". *Journal of Business Ethics 39*, 29–41.

Christian Aid (2004). *Behind the mask: the real face of corporate social responsibility*.

Conrad, K. (2005). "Price Competition and Product Differentiation When Consumers Care for the Environment". *Environmental & Resource Economics 31*(1), 1–19.

Corporate Watch (2006). *Corporate Watch Report 2006*.

Cotte, J. and R. Trude (2008). "Does Being Ethical Pay?". *The Wall Street Journal*.

D. Fudenberg and D. K. Levine (1998). *The Theory of Learning in Games*. The MIT Press.

D'Alessio, M., B. D. Devitiis, and W. Maietta (2007a). "A Comparative Analysis of the Purchase Motivation of Fair Trade Products: the Impact of Social Capital". *Journal for Perspectives of Economic Political and Social Integration, Journal for Mental Changes* (Special Edition, Fair Trade), 39–87.

D'Alessio, M., B. D. Devitiis, and W. Maietta (2007b). "A Comparative Analysis of the Purchase Motivation of Fair Trade Products: the Impact of Social Capital". *Journal for Perspectives of Economic Political and Social Integration, Journal for Mental Changes* (Special Edition, Fair Trade), 39–87.

D'Aspremont, C., J. J. Gabszewicz, and J. F. Thisse (1979). "On Hotelling's Stability in Competition". *Econometrica 47*, 1145–1150.

Davies, B. R. (2005). "Abstinence from child labor and profit seeking". *Journal of Development Economics 76*, 251–263.

De Pelsmacker, P., L. Driensen, and G. Rayp (2005). "Do Consumers Care about Ethics? Willingness to Pay for Fair-Trade Coffee". *Journal of Consumer Affairs 39*(2), 363–385.

Drumwright, M. E. (1996). "Company Advertising with a Social Dimension: The Role of Noneconomic Criteria". *Journal of Marketing 60*, 71–87.

Drydakis, N. and M. Vlassis (2007). "Corporate Social Responsibility and Wage Discrimination in a Union-Oligopoly Model". *CSR PAPER 17.2007*.

Elfebein, D. W. and B. McManus (2007). "A Greater Price for a Greater Good? Evidence that Consumers Pay More for Charity-Linked Products". *Working Paper*.

Environics International (1999). "The Millenium Poll on Corporate Social Responsibility". *Executive Briefing*.

F. Vega-Redondo (2003). *Economics and the Theory of Games*. Cambridge University Press.

Feddersen, T. J. and T. W. Gilligan (2001). "Saints and Markets: Activists and The Supply of Credence Good". *Journal of Economics & Management Strategy 10*(1), 149–171.

Fehr, E. and K. M. Schmidt (1999). "A Theory of Fairness, Competition, and Cooperation". *Quarterly Journal of Economics 114*(3), 817–868.

Friedman, M. (1970). "The Responsibility of Business Is to Increase Its Profits". *The New York Times September*(13), 32–33, 122–126.

Gadotti, G. and A. Mortara (2007). "La partecipazione dei consumatori alle iniziative sociali delle aziende tra solidarietà filantropica e consumo critico". *La Spesa Responsabile, Saggi Donzelli*, 125–155.

Garcìa-Gallego, A. and N. Georgantzìs (2009). "Market Effects of Changes in Consumers' Social Responsibility". *Journal of Economics & Management Strategy 18*(1), 235–262.

Glazer, A., V. Kanniainen, and P. Poutvaara (2008). "Firms' Ethics Consumer Boycotts, and Signalling". *Discussion Paper No. 3498, IZA, Germany*.

Graichen, A. (2008). "Fairtrade Labelling in a Bertrand Competition Model with Monopsony Power". *BGPE Discussion Paper No. 50*.

Green Paper (2001). *Promoting a European Framework for Corporate Social Responsibility*. Bruxelles: Comission of the European Communities.

Hofbauer, J., P. Schuster, and K. Sigmund (1979). "A note on evolutionary stable strategies and game dynamics". *Journal Theor. Biology 81*, 609–612.

Hotelling, H. (1929). "Stability in competition". *Economic Journal 39*, 41–57.

Immordino, G. (2008). "Fairness, Consumer Consciousness and the Welfare of Less Developed Countries". *Global Economy Journal 8*(1).

Innes, R. (2006). "A Theory of Consumers Boycotts Under Symmetric Information and Imperfect Competition". *Economic Journal 116*(511), 355–381.

J. Tirole (1988). *The Theory of Industrial Organization*. Cambridge University Press.

J. W. Weibull (1995). *Evolutionary Game Theory*. The MIT Press.

Kitzmueller, M. (2008). "Economics and Corporate Social Responsibility". *EUI Working Papers ECO 2008/37*.

Livraghi, R. (2007a). "The Economics of Fair Trade". *Journal for Perspectives of Economic Political and Social Integration, Journal for Mental Changes* (Special Edition, Fair Trade), 17–38.

Livraghi, R. (2007b). "The Economics of Fair Trade". *Journal for Perspectives of Economic Political and Social Integration, Journal for Mental Changes* (Special Edition, Fair Trade), 17–38.

Manasakis, C., E. Mitrokostas, and E. Petrakis (2007). "Corporate Social Responsibility in Oligopoly". *BE.NE.TeC. Working Paper Series, Working Paper: 2007-07*.

McWilliams, A. and D. S. Siegel (2001). "Corporate Social Responsibility: A Theory of the Firm Perspective". *The Academy of Management Review 26*(1), 117–27.

Mitrokostas, E. and E. Petrakis (2008). "Private CSR Activities in Oligopolistic Markets: Is there any room for Regulation?". *Working Papers 0816, University of Crete, Department of Economics*.

Mohr, L. A., D. J. Webb, and K. E. Harris (2001). "Do Consumers Expect Companies to be Socially Responsible? The Impact of Corporate Social Responsibility on Buying Behavior". *The Journal of Consumer Affairs 35*(1), 45–72.

MORI (2000). "The First Ever European Survey of Consumers' Attitudes towards Social Responsibility". *CRS Europe*.

Motta, M. (1993). "Endogenous Quality Choice: Price vs Quantity Competition". *Journal of Industrial Economics 41*(2), 113–31.

Noe, T. H. and M. J. Rebello (1995). "Consumer activism, producer groups, and production standards". *Journal of Economic Behavior & Organization 27*, 69–85.

Page, G. and H. Fearn (2005). "Corporate Reputation: What Do Consumers Really Care About?". *Journal of Advertising Research 45*(3), 305–313.

Paton, D. and D. S. Siegel (2005). "The economics of corporate social responsibility: an overview of the special issue". *Structural Change and Economic Dynamics 16*, 309–12.

Rode, J., R. M. Hogarth, and M. Le Menestrel (2008). "Ethical Differentiation and Market Behavior: An Experimental Approach". *Journal of Economic Behavior & Organization 66*, 265–280.

Rodrìguez-Ibeas, R. (2007). "Environmental Product Differentiation and Environmental Awareness". *Environmental & Resource Economics 36*, 237–254.

Samuelson, P. A. (1954). "The Transfer Problem and Transport Cost, II: Analysis of Effects of Trade Impediments". *Economic Journal 64*, 264–289.

Siegel, D. S. and D. F. Vitaliano (2007). "An Empirical Analysis of the Strategic Use of Corporate Social Responsibility". *Journal of Economics & Management Strategy 16*(3), 773–792.

Smith, G. and R. Stodghill (1994). "Are Good Causes Good Marketing?". *Business Week March 21*, 64–66.

Starr, M. A. (2009). "The Social Economics of Ethical Consumption: Theoretical considerations and empirical evidence". *Journal of Socio-Economics 38*, 916–925.

Tallontire, A., E. Rentsendorj, and M. Blowfield (2001). "Ethical Consumers and Ethical Trade: A review of current literature". *Policy Series 12, Natural Resource Institute, University of Greenwich*.

The Co-operative Bank (2007). *Ethical Consumerism Report 2007*. Available at: http://www.co-operativebank.co.uk/.

Valor, C. (2009). "Consumers as Drivers of CSR: European And National Policy Gaps". *Working Paper, IV CORE Conference, Berlin*.

W. Wymer Jr. and P. Knowles and R. Gomes (2006). *Nonprofit Marketing: Marketing Management For Charitable And Nongovernmental Organizations*. Sage Pubblications.

Webb, D. J. and L. A. Mohr (1998). "A Typology of Consumer Responses to Cause-Related Marketing: From Skeptics to Socially Cncerned". *Journal of Public Policy and Marketing 17*(2), 226–238.