“Is corporate social responsibility effective in improving environmental quality? Literature review”

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IS CORPORATE SOCIAL RESPONSIBILITY EFFECTIVE IN IMPROVING ENVIRONMENTAL QUALITY? LITERATURE REVIEW

Abstract

Considering continuing environmental degradation linked to economic activity, it seems essential to examine the role companies can play in implementing sustainable development. This study aims to analyze lessons learned from standard theories on the effectiveness of corporate social and environmental responsibility. Indeed, corporate social responsibility and state intervention are frequently compared under the dual lens of collective well-being and environmental quality. For some economists, corporate social responsibility is preferable to state intervention from the point of view of maximizing collective well-being. By contrast, according to some other authors, state intervention is more effective for both maximizing well-being and protecting the environment. This literature review shows that corporate social responsibility is theoretically no more effective than public intervention in environmental protection: companies can be encouraged to commit themselves to protecting the environment under restrictive conditions, but this does not eliminate the essential importance of public intervention. Analysis of the assumptions of neoclassical models shows that, in reality, they do not take into account all the properties of a public good, i.e., all the properties of the climate and the environment. Finally, the conditions for implementing CSR are incompatible with maximizing collective well-being, which explains why public intervention is theoretically preferable to CSR.

Keywords environmental efficiency, externality, private production, public good, state intervention, welfare

JEL Classification H41, H50, I31, Q58

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INTRODUCTION

More and more companies worldwide appear to be adopting, or at least displaying, socially responsible behavior. While the European Commission defines corporate social responsibility (CSR) as the integration of social and environmental concerns into business activities, Anglo-Saxon economists often see it as a strategy for attracting new, environmentally aware customers. From this perspective, one views participating in the production of public goods based on voluntary consumer contributions rather than undertaking actions that increase production costs.

According to the Bowen-Lindhal-Samuelson condition, the production of a public good is optimal when the marginal cost of production is equal to the sum of the consumers' marginal willingness-to-pay (Samuelson, 1954). However, the interplay of private decisions leads to underproduction of the public good. Economists usually conclude that this calls for government intervention. However, it is also possible to envisage that firms will engage in the production of public goods when consumers are willing to pay the price. The question then arises as to whether this private production of public goods is more or less efficient than public production.

CSR can be defined as a firm's involvement in the production of a public good to increase or maintain its profits. Based on the existing theoretical literature, it is debatable whether this private production is preferable to public production. The scientific problem is that contradictory conclusions are drawn from the various models used in neoclassical CSR theory. It is, therefore, necessary to examine the explicit and implicit assumptions that underpin the recommendations of various economists.

This literature review assesses the environmental effectiveness of CSR and provides a robust answer to the question of whether sustainable development can be based on corporate social responsibility. More specifically, neo-classical theories show that corporate social responsibility is sufficient to ensure environmental protection and that markets can regulate themselves in a way that respects nature. But are these models really robust? That is the question this paper seeks to answer.

1. LITERATURE REVIEW

Is it profitable for firms to participate in the production of public goods? Neoclassical economists show that if consumers are willing to pay for environmental quality, then it may be worthwhile for firms to engage in such an activity. In theoretical models, economists compare the respective effectiveness of private production of public goods with public production of the same types of goods. However, not all models lead to the same results or recommendations for environmental policy. While some authors show that CSR can be a substitute for public intervention, others argue that it can never be the case.

This study first presents models that argue for the exclusive development of CSR, followed by a discussion of models that contradict these conclusions. A critical review of the latter models shows that CSR can only be applied in a context that also reduces social welfare. According to these models, this explains why state intervention remains necessary.

The standard theoretical literature is relatively sparse, being based on a dozen or so contributions that need to be analyzed in detail. One of the most important studies on the exclusive development of CSR is that of Besley and Gathak (2007). Their model comprises one public good and two private goods (in the sense of Beitone (2014), i.e., exclusive and rival). The first private good is not produced and is used as cash. Each consumer and producer possess initial endowments of this good. The second private good and the collective good are both produced. The model defines corporate social responsibility (CSR) in the same way as Baron (2001), Benabou and Tirole (2010), or Bergstrom et al. (1986): a managerial strategy aimed to attract new customers who are sensitive to the issue of ecological transition and willing to pay the price. This can be described as the private production of a public good (Kitzmueller & Shimshack, 2012)[1].

Besley and Ghatak (2007) analyzed the effects of adopting public intervention instead of CSR. They assume that the state produces the public good with a technology and marginal cost curve identical to that used by companies. Production is financed by a uniform tax levied on all consumers. Therefore, it is a matter of debate whether public intervention is preferable to corporate social responsibility. When there is a low proportion of environmentally sensitive consumers, the state does not engage in any production, even though CSR is able to satisfy consumer demands. In this case, CSR would be better than public intervention in terms of promoting well-being.

A second model shows that if certain conditions are met, CSR is superior to state intervention in the production of public goods. This model is based on a comparative analysis of the costs of public intervention and the costs of CSR. Thus, although Maxwell et al.'s (2000) model draws conclusions comparable to those of Besley and Ghatak (2007), the approach is somewhat different. The primary aim of Maxwell et al.'s (2000) study is to address the question posed by Bodet and Lemarche (2007) and Porter and Van der Linde (1995): why do firms adopt socially responsible behaviors that are *a priori* costly and therefore likely to reduce their profitability?

1 Alternatively, CSR can be thought of as a voluntary strategy for reducing negative externalities.

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In response, Maxwell et al. (2000) show that it can be advantageous for a firm to anticipate and satisfy consumers' environmental demands, as these will translate into new public regulations in the more or less long term. Thus, they present a model made up of three sequences. First, firms make a voluntary choice to reduce pollution. Next, consumers and firms engage in a lobbying process to influence the government's action on environmental pollution control/abatement. Finally, once the pollution level has been set by regulation, firms will produce and sell their goods within a framework of Cournot-style oligopolistic competition. The model problem is then solved in reverse chronological order.

One of the main results of the above model is that a range of collective fixed costs borne by consumers makes it optimal for firms to implement a voluntary commitment. This voluntary commitment anticipates and runs ahead of consumer expectations.

Fanti and Buccella (2019) found the same result. Using the framework of a duopolistic market with convex technology and a wage set by unions, their study demonstrates that when producers cooperatively choose a level of commitment to CSR, profits are higher than under standard profit maximization. Thus, shareholder self-interest leads to the adoption of CSR. Trade unions, consumers, and overall social welfare stand to benefit more from the presence of CSR. Videras and Alberini (2000), Kaul and Jiao (2015), and Chang et al. (2019) reach an identical conclusion: companies can derive a competitive advantage from CSR and increase their profits.

In the following, other models are studied that lead to radically opposite conclusions. Calveras et al. (2007) identify corporate social and environmental responsibility based on the assumption of a negative externality. Through a majority vote, consumers decide on a minimum technological standard that will limit the externality. Given this standard, firms are then free to produce goods of superior environmental quality. Similarly, consumers are free to choose goods that are more or less green, i.e., more or less generative of externalities.

Their model considers a market in which a single good can be produced using different technologies but with varying degrees of pollution. Consumers derive a certain utility from consuming such a good, but they do not all have the same perception of the externality generated by their own consumption of the good. For their part, firms are free to choose their production technology in view of the minimum standard.

The optimum situation is when all consumers are fully aware of the effects of their consumption on the community. In this case, all firms will use the cleanest technology.

Consumers are defined as activists based on their sensitivity to emissions. In a sense used by Calveras et al. (2007), an activist consumer has a utility function that decreases with increasing levels of polluting emissions. Such a consumer, therefore, takes action to limit the volume of these emissions. However, is this activism enough to encourage firms to produce "green" products and thus lead the community toward maximum well-being? The answer given by the model depends on the proportion of activist consumers in the population. Calveras et al. (2007) demonstrate that consumer activism is not always sufficient to encourage firms to adopt environmentally virtuous behavior.

In view of the above, it appears that economists do not agree on the core characteristics of CSR in terms of well-being and environmental protection. In the models presented here, the maximization of collective well-being is used as a criterion for assessing social and environmental responsibility. However, Kotchen (2006) has shown that short-term welfare maximization and environmental quality are not always compatible. Kotchen's (2006) model considers consumers whose utility function is derived from the characteristics of goods rather than from the quantities of goods themselves. The individual can choose between characteristics associated with a pure private good and a pure public good. The characteristics associated with a public good are interpreted as a signal of environmental quality.

The consumer's income can be used in several different ways, i.e., the acquisition of a standard private good generating the characteristic associated with a private good; a donation for the production

of a public good; and finally the purchase of an impure public good or green good that combines the characteristics of a private and a public good. The relationship between the quantity of the consumed good and the characteristics so generated is assumed to be known by the agents and is considered exogenous. Individuals will maximize their utility based on the characteristics of the goods under budgetary constraints.

The optimal quantity of pure public or pure private goods for the individual consumer can then be obtained by maximizing the utility function. In the case of environmental quality, the result of Bergstrom et al.'s (1986) model is confirmed, whereby the characteristic associated with a public good is demanded as soon as the optimal quantity for the consumer is greater than the quantity existing in the economy. Based on the best response function of any given consumer with knowledge of the behavior of all the others, it is possible to determine the overall environmental quality corresponding to a Nash equilibrium. Four categories of consumers can be identified: free riders, contributors, environmentalists, and donors.

CSR can only be implemented in a specific competitive context. Hommel's (2004) model shows that increasing environmental quality through socially responsible behavior of firms goes hand in hand with a reduction in the degree of competition on the market and, therefore, with a decline in social well-being. Hommel's (2004) model highlights the same type of gap between economic efficiency and environmental quality. The original approach of this author (*op. cit.*) is based on Baumol et al.'s (1982) theory of contestable markets and also considers the threat of environmental or health protests against the activity. Consumers protest when they question the modalities or existence of the firm's economic activity. When the protest potentially jeopardizes the production technology or the continuation of the productive activity, it may be in the firm's interest to anticipate the threat by adopting socially responsible behavior from the outset. However, everything depends on the nature of the assets committed by the firm. When these assets are specific, the firm cannot adapt its technology or withdraw from its activity without cost. It will have a strong incentive to behave in a socially responsible way to avoid contestation. On the other hand, when assets are only weakly specified, firms can easily redeploy their activity. They have no particular incentive to be committed to environmental protection.

In addition to considering asset specificity, Hommel (2004) takes account of the depreciation period of equipment and the "burden" of fixed assets. The longer the depreciation period, the greater the likelihood that technical progress will render existing equipment obsolete, thus drastically reducing its market value. The higher the fixed assets, the greater the losses caused by such obsolescence. To sum up, Hommel (2004) speaks of the more or less high overall rigidity of invested capital and shows that a firm will only be encouraged to adopt virtuous behavior if the probability of environmental protest is high and if its production system is highly specific. Therefore, any change in the mode of activity would be very costly for the firm. Corporate social responsibility is not automatic and only becomes apparent when the economy moves away from a situation of perfect competition.

Bagnoli and Watts' (2003) model leads to similar conclusions. In their model, firms compete to produce a good that can be offered to consumers in two different forms: a strictly private good and a good that helps to improve environmental quality. By producing a private good, a firm can, therefore, contribute to the provision of a public good and, in so doing, gain a competitive advantage with consumers who are sensitive to environmental quality. The level of provision of public goods will depend crucially on the conditions of competition on the market for pure private goods.

Thus, when there is free entry to the market and a large number of firms, the price of the private good approaches its optimal competitive level, and the provision of public goods is insufficient. Consumers tend to prefer the cheapest version of the good. On the other hand, competition becomes increasingly imperfect in the market for the private good, and the price of the private good increases, moving away from marginal cost, so that consumers substitute the public version of the good for the private version.

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2. GENERALIZATION OF MAIN STATEMENTS

The main findings of the neoclassical literature on CSR can be summarized as follows.

Besley and Ghatak (2007) compare the welfare provided by public intervention, which is supposedly open to corruption, with the welfare provided by corporate social and environmental responsibility. Accordingly, it all depends on the proportion of eco-friendly consumers and the probability of checks.

When this proportion is low, the collective good is not produced, and CSR would be superior in terms of promoting well-being. When this proportion is high, public intervention is more effective than CSR on the sole condition that the frequency of checks by authorities is high.

From another angle, Maxwell et al. (2000) show that voluntary action by firms is less costly than state intervention. When consumers' fixed organizational costs are low, they will deploy a high level of resources to the lobbying process, and regulations are likely to become drastically stricter. In such cases, it is preferable for firms to avoid entering into a costly negotiation process that would result in increased regulatory constraints. When there is an increase in the organizational costs borne by consumers, certain firms may have an interest in not coordinating with competitors who are implementing a voluntary commitment. In this way, firms would benefit from a reduction in the regulatory constraint authorized by these voluntary commitments while at the same time not incurring the associated costs. To conclude, Maxwell et al.'s (2000) model provides an interpretation of socially responsible corporate behavior as well as a recommendation for public intervention to encourage spontaneous environmental regulation[2]. Consumer activism is defined in the model as the commitment of resources to improve the well-being of the community.

Conversely, Calveras et al.'s (2007) model casts considerable doubt on the effects of consumer activism and the resulting choices made by firms. Some consumers may adopt a free-rider behavior that may cancel out the favorable effects of virtuous consumer behavior. When there is a majority of activist consumers, the agreed standard will paradoxically be weak and generate strong negative externalities on the environment. Indeed, a low standard does not prevent activist consumers from consuming "green" goods. On the other hand, it allows non-activists to consume a polluting good while enjoying the beneficial effects of the activists' behavior. In other words, when non-activists know they can count on a majority of activists to lower the level of aggregate externality, they prefer to vote for a low standard and consume a polluting good whose price is lower. Firms will then produce a large quantity of polluting goods. In such a case, the market cannot spontaneously guide the community toward a market equilibrium that maximizes collective well-being.

When, on the other hand, activists are in the minority, the only way for non-activists to reduce the overall externality that uniformly affects all consumers is to vote for a high standard. Consumer activism to encourage companies to produce cleanly can ultimately have a perverse effect on the environment. Even if consumers are able to influence corporate behavior by voting for a tax that penalizes pollution, this leads to a similar result. Non-activists are encouraged to vote for a low tax, enabling them to consume the good at a lower cost while benefiting from the activists' exemplary behavior, which then reduces the overall negative externality.

In the above models, the social and environmental responsibility is assessed according to the maximization of collective well-being. However, Kotchen (2006) has shown that that these two objectives are not necessarily compatible.

The question then arises as to whether the introduction of a green good market will achieve the Pareto optimum while also improving environmental quality. On the one hand, Kotchen (2006) stresses that the introduction of private production has ambiguous effects on environmental quality. Thus, if private production technology leads to a drop in the price of a green good, private demand will increase, generating positive exter-

2 The model proposed by Innes (2004) offers a similar approach except that, in this model, CSR enables companies to avoid consumer boycotts.

nalities for the community as a whole. Conversely, if the production technology leads to an increase in price, the demand will fall, resulting in a loss of environmental quality.

On the other hand, environmental quality should be distinguished from the maximization of well-being. A deterioration in environmental quality can generate an improvement in well-being. If the private production of an impure public good leads to a fall in the relative price of the private good, consumers will substitute the private good for the green good, contributing to environmental degradation. Nevertheless, this price shock enables consumers to move to a higher utility level.

Similarly, Hommel (2004) shows that a firm's socially responsible behavior can be accompanied by a reduction in competition and collective well-being. This study uses the analytical framework of the theory of contestable markets, which casts doubt on the conclusions of traditional microeconomics regarding imperfect competition. A monopoly will not necessarily behave in a different way compared with a perfectly competitive configuration (in the usual sense of the term) if there are no barriers to market entry and exit. According to Williamson's (1981) definition, taken up by Hommel (2004), an asset is specific if its use value is lower in alternative uses than that for which it was intended at the time of initial investment. The degree of asset specificity is closely linked to the degree of cost recoverability (Baumol & Lee, 1991).

Hommel's (2004) model outlines two possible forms of industrial configuration. The first configuration involves a low degree of contestability by potential competitors or a high level of environmental and health protest. Fixed assets are burdensome and not easily redeployable. The threat of potential entrants is low (with high barriers to entry), while the threat of environmental protest is acute insofar as such a challenge is likely to jeopardize the very survival of the company (very high exit costs). The second configuration involves a high degree of contestability by potential competitors or a low level of environmental protest. Assets are lightweight and/or easily redeployable. Hit-and-run behavior is inexpensive due to the low barriers to entry (or exit). Consequently, the threat of an environmental protest has little impact on the firm's behavior since it can modify or adapt its activity at any time.

According to Bagnoli and Watts (2003), a planner wishing to maximize the collective well-being of the economy must therefore choose between two alternatives:

- Either making the conditions of competition on the market for the private good less attractive. In this case, the collective good is sufficiently provisioned, or even over-provisioned. Environmental quality means moving away from the optimum in the market for traditional goods.

- Or increasing competition on the market for private goods so that maximum well-being is achieved on this market, but at the expense of a deterioration in environmental quality.

Tables 1 and 2 generalize the analysis by presenting the main assumptions and results of the different models.

Table 1. Models on CSR and pubic intervention

Implicit or explicit assumptions about	Besley/Ghatak model	Calveras model	Maxwell model
Consumers	Heterogeneous (more or less sensitive to environmental protection)	Heterogeneous (activist or not)	Homogeneous (thus eliminating the free rider problem associated with the private production of collective goods)
The nature of public goods	Exclusive (thus eliminating the free-rider problem associated with the private production of public goods)	Non-exclusive (stowaway problem emerging)	Non-exclusive
The status of public intervention	Corrupt state vs. virtuous firm ("bias" in favor of private production of public goods)	No more or less costly than consumer activism; no more or less corrupt than private firms	Public constraint is more costly than voluntary private contributions (private production of public goods should, therefore, be favored)

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Table 2. Models on CSR and well-being

Implicit or explicit assumptions about	Kotchen/Bagnoli and Watts models	Hommel model
Consumers	Heterogeneous, profile evolves according to the level of income received	Uniform: consumers put pressure on firms through environmental protest
The nature of public goods	Non-exclusive (combined with the consumer hypothesis, explains the possible gap between economic and environmental efficiency)	Non-exclusive
The status of public intervention	No more or less costly than private intervention by companies. Opens up the possibility of complementarity between firms and the State	Idem

According to Table 1, the social and environmental responsibility is assessed according to the maximization of collective well-being. However, Kotchen (2006) has shown that maximization and environmental quality are not always compatible. Similarly, Hommel (2004) shows that a firm's socially responsible behavior is accompanied by a reduction in competition and collective well-being.

3. DISCUSSION

The models of Besley and Ghatak (2007) and Calveras et al. (2007) lead to contrasted conclusions not only on equilibrium under CSR but also on equilibrium under state intervention. In Besley and Ghatak's (2007) model, the socially responsible behavior of firms is enabled by green consumers willing to pay a higher price for environmental quality. In this case, the market appears to be sufficient in itself to manage the problem of public goods and environmental protection.

Calveras et al.'s (2007) model assumes consumer heterogeneity, in common with the theory of Besley and Ghatak (2007). However, in contrast with Besley and Ghatak's model, Calveras et al. (2007) consider consumer heterogeneity as a factor in the regression of collective well-being. They introduce the possibility that consumers with low environmental sensitivity will gain from the beneficial effects of the behavior of green consumers. The founding principle of their model is that "environmental quality" (as defined above) has the property of non-exclusion: it is impossible to exclude an economic agent from an environment that is common to all. According to Besley and Ghatak (2007), each consumer must pay individually for access to environmental quality. Therefore, although the authors cited here speak of public goods, these do not have the characteristic of being pure public goods.

It should be borne in mind that a pure public good is both non-rival (consumption of the good by one individual does not influence the quantity available to others) and non-excludable (no one can prevent an individual from making use of the good once it has been produced). Whereas Calveras et al.'s (2007) model applies to pure public goods, Besley and Ghatak's (2007) model applies only to club goods (non-rival and exclusive). This is hardly acceptable since the issue of concern here is environmental quality, which, in essence, is a public good to be shared by all without discrimination.

This hypothesis arises from the fact that the environmental good, which may, in principle, be thought of as non-excludable, is the joint product of a private good. Besley and Ghatak (2007), therefore, make a conceptual shift by assuming that private and public goods share the common characteristic of excludability.

By making an implicit assumption about excludability, Besley and Ghatak (2007) eliminate the problem of free-riding behavior from their analysis. However, free-riding behavior is precisely what characterizes the environmental issue. Thus, once the restrictive exclusion hypothesis is refuted, the voluntary equilibrium of this model poses a twofold problem: not only is the provision sub-optimal, but free-riding behavior may become widespread, leading to a lack of funding for the public good. Under these conditions, only state intervention and the levying of a tax would be able to ensure the production of a public good.

Ghatak and Besley (2007) and Calveras et al. (2007) yield similar results in terms of public intervention. For Calveras et al. (2007), CSR appears to be neither superior nor inferior to state intervention. The position of equilibrium is determined by the proportion of activist and non-activist con-

sumers, whatever the modalities of environmental quality management. Such a result is obtained when the voting procedure under state intervention relates to the amount of the tax and not the very existence of the tax. In the latter case, a high proportion of activists would allow the introduction of a penalty for pollution and prevent any free-rider behavior. The economy would thus move closer to the optimum by increasing the technological standard chosen by firms under tax pressure.

Besley and Ghatak (2007) draw conclusions from their model that are more differentiated on the question of state intervention. They identify cases where CSR is superior to interventionism. Nevertheless, these conclusions presuppose the excludability hypothesis. Furthermore, the comparisons made by Besley and Ghatak (2007) imply that supposedly virtuous firms (CSR regime) are pitted against a supposedly corrupt government (state intervention regime). However, their argument is invalid insofar as it compares public intervention open to corruption with companies that are supposedly perfectly honest. Even the authors themselves assert that cheating is also possible in the private sector.

Empirical studies show that corporate greenwashing is commonplace (Lyon & Kim, 2007; King & Lennox, 2001; Videras & Alberini, 2000; Salanié & Treich, 2008). The comparison should be made in the following terms: is public intervention more or less effective when orchestrated by potential cheats than when public goods are provided by the private sector, which is also potentially open to cheating? It all depends on the respective frequency of audits in the private and public sectors. There is no evidence showing which sector might have more effective checking.

The study further analyzes the reasons for the divergence between Calveras et al.'s (2007) model and the theoretical scheme of Maxwell et al. (2000).

Contrary to Calveras et al.'s (2007) point of view, Maxwell et al. (2000) assume that all consumers are identical and therefore ignore any possibility of free-rider behavior. In that case, firms would be all the more inclined to voluntarily commit to pollution control since they face consumers who are uniformly sensitive to the environmental consequences of productive activity. It can be seen that Maxwell et al. (2000) concur with Besley and Ghatak (2007) in leaving aside any possibility of free-rider behavior. This omission arises from Besley and Gathak's (2007) implicit assumption of excludability and Maxwell et al.'s (2000) assumption of consumer homogeneity.

Maxwell et al. (2000) conclude that CSR is always preferable to public intervention, given the same level of emission control, basing their argument on another central assumption. Indeed, their theoretical model postulates that public decision-making is the exclusive consequence of a costly lobbying process. Firms and consumers alike must devote a greater or lesser proportion of their resources to influencing public decisions. Without this influence, public decisions are devoid of autonomy and will fail to produce any legal constraints for environmental protection. However, it is possible to assume, alternatively, that activists might commit resources to directly influencing firms, thus forcing them to implement CSR policies. The conclusion that CSR is preferable to public intervention is already enshrined in the postulates of Maxwell et al.'s (2000) model.

Therefore, theoretical conclusions are highly uncertain concerning the relative effectiveness of CSR versus public intervention. Models suggesting that CSR is superior overlook either the essential non-excludability of environmental quality or the heterogeneous nature of consumer behavior. This masks the economic and environmental inefficiencies generated by free-rider behavior. In this respect, any conclusions about the effectiveness of CSR based on the Calveras et al. (2007) model are invalidated if the non-excludability of environmental quality and consumer heterogeneity are both taken into account.

Furthermore, the comparison between state intervention and CSR does not have a sound theoretical basis since firms and the state are treated asymmetrically. For Besley and Gathak (2007), firms are assumed to be virtuous, while the state is assumed to be corrupt. For Maxwell et al. (2000), public intervention is the result of citizen pressure, while firms are not subject to any direct pressure.

A critical analysis of the models reveals that CSR does not obviate the need for public intervention.

Kotchen (2006) appears to brush aside the proposals of Besley and Ghatak's (2007) on the superiority of

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CSR over the public production of public goods. This divergence of views can be explained by the adoption of two different hypotheses.

Besley and Ghatak (2007) disregard the non-excludability hypothesis, whereas Kotchen (2006) used it to explain the possible discrepancy between welfare maximization and environmental quality (individuals maximize their satisfaction by behaving as free riders, even though that causes a decline in environmental quality); private production of public goods is therefore not necessarily optimal.

For Kotchen (2006), the propensity to pay for environmental quality does not depend on a given *a priori* profile of the consumer but on the level of income. Contrary to the hypothesis adopted by Besley and Ghatak (2007) and Warr (1983), a given individual can be sensitive or insensitive to environmental quality depending on the evolution of his or her income. This result is derived from Kotchen's (2006) model and is in agreement with Arora and Gangopadhyay (1995); they explain that socially responsible corporate behavior is more developed in wealthy countries due to a higher level of per capita income. It is conceivable that a state policy of income redistribution would raise the incomes of the most disadvantaged and thus improve environmental quality. Kotchen's (2006) model may, therefore, lead to a result that the author himself does not mention: CSR can be effectively provided it is backed up by active intervention by the public authorities.

A possible lesson that can be drawn from Hommel's (2004) model is not actually mentioned by Hommel himself. It is clear that maximizing collective well-being is in direct opposition to environmental efficiency. In this sense, Hommel (2004) radicalizes Kotchen's (2006) findings. Firms that behave in a socially responsible way operate in a context of imperfect competition, imposing a price that reduces consumer welfare and, more generally, collective well-being. Firms that contribute to environmental protection (environmental efficiency) will reduce consumer purchasing power (reducing well-being). Conversely, firms that fail to adopt any socially responsible behavior (environmental inefficiency) will behave like atoms of perfect competition (welfare maximization). From the point of view of public intervention, this means that a competition policy that strives to maximize the competitiveness of market structures also implies that the state should take responsibility for environmental protection.

CSR leads to a departure from the conditions of perfect competition. Millock and Salanié (2003) and Denicolo (2008) also found this feature: CSR would appear to encourage the formation of barriers to entry or the formation of cartels.

Friedman (1970) asserted that the only social responsibility of companies was to increase their profits without worrying about the environment or negative externalities. His thinking confirms the theoretical findings of this paper: the neoclassical models that attempt to demonstrate the economic and environmental efficiency of CSR are neither robust nor perfectly consistent. This is why this paper suggests that state intervention remains totally necessary. The significant development of theoretical research (in the 2000s) on the effectiveness of CSR has now given way to empirical studies. This empirical review is necessary, but most empirical studies show that CSR is not sufficiently effective from an environmental point of view because firms are too strongly encouraged to engage in greenwashing (Fanti & Buccella, 2019). Relatively recent studies have shown a positive correlation between corporate profits and investment in CSR (Emezi, 2015), but the opposite has also been found (Vogel, 2008). According to Vogel (2008), even if it were possible to convincingly demonstrate a positive causal link between CSR and corporate financial performance, there is no telling exactly what this would prove. If some companies really are more profitable because they are more responsible, it does not necessarily follow that their competitors would be more profitable if they were more responsible. It is also possible that the market niche for responsible firms is limited and that they would be better off pursuing a less responsible strategy (p. 136). CSR measures may be of practical interest, but the fight against climate change cannot be waged without the intervention of the state and the legal constraints it places on firms.

The significant development of theoretical research (in the years 2000) on the effectiveness of CSR has now given way to empirical studies, in particular addressing the link between CSR and profit. This empirical review is crucial, but a similar dividing line (between CSR and profit) can be found in the theoretical literature.

CONCLUSION

This study aimed to answer the following question: does standard economic theory succeed in demonstrating the superiority of CSR over public intervention? The general theoretical lesson to be drawn from neoclassical studies of CSR could be that such approaches call for caution. A very restrictive framework of hypotheses first needs to be validated before it can be demonstrated that voluntary contributions from firms bring greater collective well-being than public intervention in the production of public goods. It is indeed difficult to address problems linked to the production of public goods to improve the quality of the environment while ignoring its non-exclusive nature and the heterogeneous commitment of consumers. Furthermore, while CSR makes it possible to generate additional well-being, there is no guarantee that environmental protection will be strengthened as a result.

An examination of neoclassical CSR models shows that their conclusions are flawed. Companies cannot solve environmental problems without state intervention. The market is not self-regulating from this point of view, even if the voluntary contribution of consumers is taken into account. This study suggests that the state should focus on reducing income inequalities to raise consumer awareness of environmental protection. Firms, for their part, need to be supervised and supported by public intervention, as private incentives are not sufficient to internalize all the negative externalities associated with economic activity.

AUTHOR CONTRIBUTIONS

Conceptualization: Nicolas Piluso.
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