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THE ROLE OF PUBLIC AUTHORITIES IN CORPORATE SOCIAL RESPONSIBILITY

We analyze the possible responses of public authorities to corporate socially responsible initiatives and the effects on the corporate decision of undertaking socially responsible investments. We shed light on the interference of public and private decisions regarding corporate socially responsible investment and on the manner it affects the expected outcomes. The influence of public authorities on corporate social responsibility decisions is complex. First, we explain the failure of public services as the motivation for socially responsible actions undertaken by companies. Second, we deal with the response of public authorities to corporate responsible investment. Public authorities may adopt cooperative or non-cooperative behavior that affects the equilibrium reached in the market. Their choice influences the decision of the company to develop socially responsible projects. We exemplify by a simple model the microeconomic insights of corporate social responsibility decisions. The study can be useful as a start point in the capital budgeting of this type of investment. It also offers a new perspective showing how corporate social responsibility can become an instrument for improving market equilibrium.

Keywords: corporate social responsibility, Pareto improving, second best, corporate regulation, privately provided public goods

JEL codes: G38 – Corporate Finance and Governance: Government Policy and Regulation, H41 – Public Goods, D61 – Allocative Efficiency

Abbreviations:

CSR – Corporate social responsibility

SRI – Socially responsible investment. In the present work, SRI refers to direct investment in socially responsible projects undertaken by companies.

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1. INTRODUCTION

Corporate Social Responsibility (CSR) has gained an increasing importance in recent years (Mallin 2004). The number of companies disclosing information on their socially responsible activities and the interest of public entities in promoting CSR concerns and policies testify to its importance. It is an area that cannot be neglected when considering the

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strategy of a company and is an important source of competitive advantage. We address the insights of corporate social responsibility decisions. A better knowledge of CSR decision-making issues helps in explaining different patterns in corporate behaviour, as well as designing appropriate policies.

A specific aspect of social responsibility is the interference between private and public decisions. Their specific combination has a major influence on the outcome of corporate social responsible investment, and more generally, on social welfare. The effects are equally important for managers in conducting the strategy of the company and for public authorities in designing allocative public policies. A thorough analysis of the interference between public and private decisions in the CSR area is indispensable in the analysis of socially responsible investment.

The regulations imposing high social and environmental standards evolve constantly and companies are obliged to make the necessary investment in order to cope with it and obtain or keep their "license to operate". Due to their mandatory character, such decisions do not bring any comparative advantage for the company and do not represent a veritable corporate social responsibility action. In the following work we focus on projects designed to respond to the social, ethical or environmental needs of the community that enterprises accept voluntarily.

The corporate decision to implement socially responsible investment results from a complex system of economic and psychological motivations including reputation, reduced conflicts with the stakeholders, increased profits, but also care for the environment, charity etc. Our aim is to present a particular mechanism through which public authorities influence the economic incentives of private companies to adopt corporate social responsibility. Obviously, economic reasons are only a part of the decision-making process, non-economic incentives being equally important. The intention behind this work is to show how the behaviour of public authorities influences the economic incentives for corporate social responsibility. Thus, the paper responds to the question: "Can public authorities influence the economic incentives of the companies to get involved in CSR projects?". The reader must be aware that it shall not provide a straight answer to the question: "Will companies undertake socially responsible projects?". We shall also keep in mind that the effect of the public decision on corporate behaviour regarding CSR is complex and cannot be limited to the particular aspects presented here.

We first explain how the failure of the public sector in providing public goods and services efficiently determines the motivation and objectives of

corporate social responsible actions. The same idea was sustained by Besley and Ghatak (2007). Our approach expands the analysis by discussing the response of public authorities to CSR actions. We present how the degree of cooperation manifested by public authorities influences the economic outcomes of the CSR projects and ultimately the managers' decision to undertake social responsible investment. We propose a theoretical model that considers different forms of public sector inefficiency and legitimates the role of CSR in improving the market equilibrium. The model proves that public authorities have an important part in the success of social responsible investment (SRI) of companies. The difference consists in the choice they make to cooperate or not with the corporations in CSR actions.

The paper deals with some particular aspects regarding how public authorities can act in promoting CSR. It suggests an additional path in analyzing the influence of their behaviour on the expected outcomes of CSR actions. The results are useful for public authorities, in the sense that they may be interested to consider the effect of the degree of cooperation with private entities in designing appropriate CSR policies. The research may also be of interest for managers and shareholders, pointing to an additional factor to consider in analyzing CSR investments, namely the attitude of public authorities. In the same vein, the findings can also be useful for orienting investors' behaviour, in the sense of contemplating the behaviour of public authorities when predicting the success of CSR initiatives implemented by the issuer.

From a theoretical point of view, the contribution of the article can be anticipated in three ways. First, it enriches the CSR literature referring to a less debated topic, namely the economic incentives of companies to get involved in socially responsible activities. The paper emphasizes the role of public authorities in determining the success of socially responsible investment undertaken by companies. The extent of the collaboration manifested by the public decision-makers has a role to play in shaping the success of CSR actions. Second, it offers a new approach on CSR as an instrument used to deal with public sector inefficiency, by explaining its functioning. Third, it exemplifies by a simple model how public decisions can influence the equilibrium reached on the market. Under the hypotheses stated in the paper, the collaborative attitude of public authorities influences the strength of the economic incentives for companies to implement CSR actions.

The remainder of the paper is organized as follows. The second section reviews the related literature. In the third section, we explain how the failure

of the public sector in providing public goods efficiently drives companies to undertake CSR projects. In the fourth section, a simple model is proposed to explain the rationality of the SRI in order to fight against the inefficiency of public services. The fifth section discusses the assumptions used and possible extensions and the sixth one concludes the study.

2. RELATED LITERATURE

The corporate governance literature has an important part dedicated to CSR issues and to their implications, either from a managerial or a financial standpoint. There are also theoretical contributions regarding various reasons for the involvement of companies in socially responsible activities. They all have as a starting point the definition of CSR, a complex concept that raises a large variety of explanations emphasizing different aspects. The World Business Council for Sustainable Development defined CSR as the continuing commitment by business to behave ethically and contribute to economic development, while improving the quality of life of the working force. The European Commission understands CSR as a voluntary decision of a company to contribute to a better society and a cleaner environment (Hediger 2010). In a more detailed analysis, Harwood and Humby (2008) consider social, environmental and ethical issues as included in the corporate responsibility features. Other definitions of corporate responsibility also relate to sustainability issues. Hence, Weber (2008) considers CSR as a subsection of the corporate sustainability framework, dealing with short-term activities centered on social, environmental and ethical issues.

Heal (2005, p. 12) provides a far more restrictive definition considering that “CSR involves taking actions which reduce the extent of externalized costs or avoid distributional conflicts”. In a more complex context, the definition by the British Department of Trade and Industry explained in Deakin and Hobbs (2007), considers that CSR assumes the involvement of three different categories of stakeholders: the managers, the shareholders and the regulatory authorities. The last two definitions are particularly interesting when considering the role of public authorities in promoting CSR.

On the other hand, the debate remains open regarding the opportunity of companies undertaking CSR actions. There are arguments in the literature that a strong CSR policy helps in increasing the market share, reducing the costs and the agency conflicts inside the company, improving the relationship with employees and other stakeholders and generally

diminishing the risk (Harwood and Humby 2008, Weber 2008, El Ghoul et al. 2011). Alternatively, surveys on consumer samples demonstrate that the goals they expect from the companies are productive rather than social or environmental (O'Connor and Meister 2008, Roberts 1996). The idea is in line with Friedman (1970) arguing that the objective of a firm is to maximize shareholders' wealth and involvement in CSR actions prevents it from achieving its goal. The above arguments suggest that companies should not undertake CSR investment. Considering the failure of public authorities to provide public services efficiently as the motivation for CSR reconciles the apparent opposite approaches above, as shown in the next section.

The link between public sector failure and corporate socially responsible action is acknowledged in the literature. Discussing managers' incentives to develop or not CSR activities, Mackenzie (2007), based on the signaling theory approach, assumes that in an economy with no market failure, companies would get involved in CSR activities. He considers that market failures such as information asymmetry, weak competition and external costs and internal incentives such as non-adapted performance management systems are causes for management boards' decisions of breaching CSR codes. In a more general vision, the public sector failure may be considered as an incentive for companies to implement socially responsible investment.

Heal (2005) considers that CSR is economically justified when a resource allocation is necessary in order to deal with the external effects, as well as when it helps reduce the distributional conflicts which are not the subject of strict regulation. The approach is rather qualitative and based on the commitment of companies to reduce their negative influence on society and to comply with social justice requirements. Thus a company is expected to take socially responsible actions in order to internalize a negative externality it produces or to solve eventual distributional conflicts raised by its activity. For example, it is expected to undertake actions to deal with the pollution it produces or to provide financial support to organizations that have as an objective to deal with the direct or indirect negative effects of its activity.

The idea of the decisions of public authorities influencing the achievement of CSR objectives is scarcely discussed in the literature. Deakin and Hobbs (2007) propose a model of CSR based on three pillars, among which are the regulatory authorities with the aim of providing a mechanism for effective CSR actions. The paper does not put emphasis on the motivation of corporate social responsible investment, however, it insists on the necessity of public actions meant to sustain the involvement of the companies in SRI.

Besley and Ghatak (2007) investigate the opportunity of corporate SRI and explain that they are welcome whenever public goods result as a by-product of the usual activity of the company. They are also justified if the monitoring of the government is poor, when government and companies' opportunism is assumed. Their model considers two categories of consumers, the carrying consumers and the neutral ones and the relative weights of the two classes are key variables in explaining the opportunity of CSR actions.

Our aim is to study the public authorities' optimal response to CSR initiatives. We design a model similar to that of Besley and Ghatak (2007), but with a simplifying assumption regarding the identical utility function for all consumers, in order to explain the effect of a cooperative or non-cooperative attitude of public authorities on the success of the SRI implemented by companies.

The behavior of public authorities is a key issue in determining the efficiency of corporate social responsible investment. The effect is complex, starting from their regulatory role and continuing with the cooperative or non-cooperative attitude in the process. Camison (2010) studies the effect of regulation on the improvement of environmental protection and finds that voluntary cooperative regulation leads to better results compared to the coercive, also encouraging innovation and commitment beyond the legal constraints.

We consider that cooperative public authorities decide such an allocation and redistribution pattern to allow the community to benefit in its entirety from the corporate SRI. This implies changes in the taxation for enabling the citizen to correctly reward the SRI of the companies, tax reductions for socially responsible companies, adjustments in the quantities of public goods provided to favour social utility maximization, and contracts with companies involved in SRI to cover the costs of the public goods resulting from the process etc. Public-private partnerships may be regarded as part of the latter form of cooperation mentioned. Their effects on the economy are largely documented in the literature (Essig and Batran 2005). Obviously the cooperative attitude of public authorities can also be partial, meaning that they make decisions that allow the social utility to increase by SRI, but not to a maximum. Such choices may be due to an imperfect knowledge of the consumers' preferences, but also to the opportunistic behaviour of government. Non-cooperative public authorities would completely ignore the corporate decision of committing to provide a certain quantity of a public good, hence keeping unchanged the resources allocation and the fiscal

policy. Our study presents the effect of cooperation on the outcomes of the corporate decision to implement socially responsible projects.

From another point of view, Doh and Guay (2006) emphasize the influence of government or/and institutional factors on the preferences regarding CSR objectives in different communities. They explain that economic conditions, cultural inheritance, political grounds and government decisions influence the expectations of the community in general, and of stakeholders in particular, regarding the extent and the domains of the corporate social responsibility. Also, Salaber (2007) argues that investors' perception about a company being strongly or weakly committed to corporate social responsibility goals depends on the national culture or religion.

Our paper questions the economic advantages of companies derived from CSR activities initiated in response to public sector failure. Thus, the CSR becomes a way to deal with the inefficiency of public authorities in providing public goods, hence generalizing the conclusions of Heal (2005).

3. FIGHTING AGAINST INEFFICIENT PUBLIC GOODS PROVISION

The framework of the CSR investment decision includes two types of decision makers: the managers and the public authorities. The classical generally accepted assumptions state that managers have the objective of maximizing shareholders' wealth and, in a general context, of ensuring harmony with the other stakeholders' goals. The public authorities act in the interest of the majority of the community by providing public goods in order to maximize social utility. However, in practice the objectives above are not always obvious or not even formally assumed by managers of public or private entities¹.

From the agency theory standpoint, both decision-makers are subject to agency conflicts. Managers can make decisions that are in their own best interest, affecting the shareholders' outcomes. Public authorities also can behave opportunistically and direct public financial resources to activities that bring them private benefits.

¹ With the reference to the classical objective of management to maximize the shareholders' wealth, Loderer et al. (2010) show that in an international context of analysis the majority of managers do not mention their interest in it in the statements regarding the main objectives of the company. Also, different studies on corruption put in doubt the achievement of the objective by public authorities as we assume (Mauro 1995).

The shareholders can use several instruments in order to supervise the managers' activity. The range of the monitoring instruments includes, among others, the dividend policy, the capital structure, the audit, certain schemes of rewarding managers, etc. (Jensen and Meckling 1976; Easterbrook 1984). Besides, in the case of failing to protect shareholders' interests, the managers can be easily replaced and even punished for their mistakes.

Regarding the other category of agents, in a democratic regime public authorities are elected periodically. The punishment for not acting in the best interest of the citizen, by mistake or by intention, is only the loss of the next election, which often is not so hard to bear. The lack of control instruments can induce disequilibria in the market. The citizen can do little to make things better during the mandate of a certain authority. Furthermore, the efficiency of public actions is very difficult to assess, and fraud in the public system is hard to uncover and prove. Thus, the citizens have far less means to express their disagreement with the public actions than with the private ones, and even fewer mechanisms to induce a change in the provision of public goods. Our model is based on the agency theory assumptions and introduces corporate social responsibility as an instrument to cope with public sector inefficiencies.

The goods and services aimed at satisfying ethical, social and environmental demand, responding to specific categories of social needs, are complementary to the private ones. The complementarity corresponds to the empirical observation of the individual behaviour. For a sufficiently long time we assume that any rational individual becomes sensitive to ethical, social and environmental objectives, either because of the direct effects on his/her individual welfare function (he/she feels guilty for consuming products which do not respect high ethical, social and environmental standards) or due to the associated high externalities (consuming goods that are produced disregarding the environment, ultimately leads to living in less favourable conditions). We, however, want to comfort the reader at this point by mentioning that the hypothesis of the SRI outcomes being complementary to the private goods is not a necessary condition for the validity of our conclusions.

The ethical, social and environmental issues exhibit properties of public goods: important external effects, non-excludability and non-rivalry (Altemeyer-Bartscher, Rübhelke and Sheshinski 2010). Therefore, traditionally they should be provided by public authorities. If public services are efficiently provided, companies should not be concerned about social and environmental issues beyond their legal constraints. In this case, the premise

for the maximization of social utility are ensured by the efficiency of the public authorities, and the corporate decision of involving in CSR activities appears irrational from a financial viewpoint. It imposes a supplementary cost to the company, and indirectly to its stakeholders, without providing any corresponding monetary benefit (Friedman 1970). If the public authorities provide a certain category of public goods inefficiently, involving the company in CSR activities can be a form of fighting against the public inefficiency. The company would act in the interest of its own stakeholders (including the shareholders), improving their general utility. In the meantime the firm can benefit from the improvement of the relationship with the stakeholders. Hence, its primary goal of improving shareholders' wealth is accomplished.

The provision of certain categories of public goods can be achieved either directly or indirectly, by financing a certain quantity of the required goods or services. By committing to generate a certain quantity of public goods inefficiently provided by public authorities, the company contributes to the maximization of the stakeholders' individual utility, and by these means, to the maximization of the social utility.

The companies are involved in public goods provision in different ways depending on the type of public services' inefficiency and on the nature of the public good involved. As an example, if the public authority provides a certain good at too high a price, the company can put in place a mechanism to provide the same public good at a lower cost, except for a narrow range of public goods which cannot be provided by private entities due to the high political and social risk (such as national security, justice, state, etc.). Imagine that the public provision of ambulatory health care services is too expensive and a company puts in place an ambulatory health care centre offering the same services at lower costs. Financing the provision of a supplementary quantity from the public good in discussion through the public authority would not be suitable in this case. According to its capacity, the company may provide the whole quantity needed of the public good in question or a part of it.

Alternatively, the public authority may have difficulties in identifying the social needs correctly or in establishing their correct hierarchy. Thus, they may create distortions, at least for the length of the present budget execution. The result is that the public authority cannot provide a supplementary quantity of the public good, merely due to a shortage of financial resources. Financing the public provision of the public good can be a good choice for the company. It can finance, for example, the endowment of a school laboratory or a traditional festival that the public authority did not consider a priority for the year.

The private sector cannot be a substitute for the public one for a large number of reasons related to national security, incapacity to provide certain categories of public goods or the entire quantity needed of certain goods, the impossibility of financing the cost of the public goods, the heterogeneity of public goods, etc. Therefore, the following model is far from arguing with the role of public authorities in providing public goods. It legitimizes the involvement of companies in providing public goods either directly or by financing their cost, if particular economic conditions hold.

Regarding the implication of public authorities in sustaining CSR actions, the range of public measures that can be taken into account is large. It includes tax adjustments for SRI² or companies investing in CSR, household taxation adjustments in order to improve the market equilibrium, corrections of the public goods production programme in order to allow obtaining maximal satisfaction for the community from companies' SRI, and contracts signed with the companies in order to provide the public goods efficiently (as, for example, public-private partnerships).

For example, a cooperative public authority can encourage corporate social responsible investment by reducing the income tax rate for the company or for the profit obtained from investing in SRI. The cooperation reduces the initial investment cost or increases the potential future cash flow of the company. On the other side, the regulatory authority should impose measures in order to prevent abuse on the part of the companies. Another indirect fiscal measure is to moderate the taxation for portfolio investments in SRI. The potential effects of such measures consist not only in encouraging the companies to invest in CSR if the screening mechanisms in place are considered efficient, but also in a change in investors' culture.

The public authority can also reduce taxation in order to allow the consumers to reward the SRI, hence improving the market equilibrium. Tax reduction suits particularly the first case of inefficiency of the public authority, namely the provision of a public good with high costs. This can be completed by an adjustment in the quantities provided from other public goods, to allow the maximization of social utility for the community.

A particular cooperative approach consists in continuing to maintain the taxation system, but shifting the direct provision of the public good to its acquisition from the company based on public contracts, public-private partnerships or other forms of procurement.

²As for income from SRI portfolio investments in Netherlands acknowledged in Scholtens (2007).

Although all the actions mentioned above are forms of cooperation, their effects on the potential outcomes of the SRI can be different. In practice, they determine different cash flows to the company implementing CSR actions. Their extent also depends on conditions external to the company such as the competition in the specific market of the company, the degree of social culture of the citizen and so on.

The range of CSR actions is also very large, from internalizing a negative externality produced to improving work conditions for the employees or financing environmental, education or health services. All CSR actions result in providing a public good, either directly or by financing its production. The choice of the public good provided is very difficult. It depends on economic, psychological and sociological arguments and may be related or not to the main activity of the company. However, some studies (such as Becker-Olsen et al. 2006) conclude that choosing a CSR activity related to that of the firm ensures a better visibility. One very important criterion in the choice of CSR destinations is the dimension of the unsatisfied need of the community for the selected public good. The choice regarding the best way to get involved in providing the public good selected depends on the specific features of its production and the range of beneficiaries, and also on the degree of cooperation with the public authorities.

In a financial approach, the decision of the companies to invest in social responsibility objectives must be based on estimation of the resulting cash flows and an adequate discount rate. The attempt may be very difficult especially knowing that there is no clear empirical evidence sustaining a direct financial impact of SRI³. In this case, simple signaling the role of CSR may not be enough for companies to bear additional costs, especially if substitute signaling instruments exist. The model below explains how the failure of public authorities to provide public goods efficiently can be one possible incentive for companies to invest in CSR.

4. THE EFFECT OF THE COOPERATION OF PUBLIC AUTHORITIES ON THE OUTCOMES OF CSR INVESTMENT

We consider an economy providing three homogenous and complementary goods, formed of a representative perfectly competitive company *E* providing the private good *Z*, and of the government providing

³Thomas et al (2007) tried to overcome the obstacle providing a methodology of estimating the added value of a company taking into account the environment damage it produces (the TrueVA). This concerns a measurement of the negative externalities of the company.

two public goods X and Y . N identical consumers are considered, having the individual utility function $U(x, y, z)$ and the same revenue R . The quantities of the three goods acquired by a representative consumer are x, y, z . The prices paid by an individual in order to benefit from the goods X, Y and Z are denoted by p_x, p_y and p_z , respectively. While the price of the private good Z is paid by consumers directly in the market, the price of the public goods is the fiscal burden supported by taxpayers.

The N consumers are also endowed with a voting right which gives them, to a certain extent, an instrument to monitor the public authority. The vote can be an effective monitoring instrument just before the elections, but it certainly has a limited effectiveness for a long period afterwards. Furthermore, the public authorities also consider in their decisions the private benefits that can be derived from a solution incompatible with the social welfare maximization.

We develop the model considering the cooperative behaviour of the public authority as exogenous.

In the first phase, the Paretian optimum solution⁴ is derived, then the two cases of failure in providing the public good are introduced and the responses of the company through CSR investment are modelled. In each of the cases, we model the status-quo situation which is a second-best solution, and then we introduce the hypothesis of the intervention of the company in providing the public good. The new solution derived is compared to the status-quo situation in order to emphasize the conditions necessary for offering strong economic incentives for the company to implement the SRI required for the production of the public good. For each of the two cases of government failure in providing the public good, two particular sets of conditions are compared, defined according to the public authority's behaviour of cooperating or not.

The Paretian optimum solution

The equilibrium solution is derived from the utility maximization for the representative individual, $Max\{U(x, y, z)\}$, under the budgetary constraint. The form of the utility function was chosen in order to satisfy the condition

⁴The Paretian solution is derived assuming the voluntary provision of public goods which is a characteristic of the corporate social responsible actions.

of the complementarity of the three goods⁵. Hence the choice of the minimal value of the three expressions, allows for excluding the possibility of obtaining satisfaction without consuming one of the three goods. The use of the logarithmic form ensures the condition of the decreasing marginal utility, while a and b allow for establishing the optimal consumption of the public goods relative to one unit consumed of the private one. In order to find the quantities of private and public goods to be provided in the optimal solution, we use hereafter the following utility function for three complementary goods:

$$U(x, y, z) = \text{Min} \left\{ \ln \left(\frac{x}{a} + 1 \right), \ln \left(\frac{y}{b} + 1 \right), \ln(z + 1) \right\}. \quad (1)$$

The constants a and b are the complementarity factors assumed to be positive. This is one of the simplest utility functions for complementary goods and has some very useful features that simplify the model from a mathematical perspective offering a fairly correct economic model: a) $U(0,0,0)=U(x,0,z)=U(0,y,z)=U(x,y,0)=0$, which satisfies the condition of the three goods being complementary; b) the function is non-decreasing and differentiable; c) it is not homogeneous of degree $\theta > 0$; d) its second derivative is negative allowing for modelling the decreasing marginal utility of the goods; e) the complementarity factors for the goods X and Y were established as relative to the good Z , which simplifies the economic interpretation.

The budgetary constraint becomes:

$$xp_x + yp_y + zp_z = R \quad (2)$$

where R is the volume of financial resources available for the representative individual and assumed constant, x , y , z denote the quantities consumed of the three complementary goods at the prices p_x , p_y and p_z respectively. The Paretian equilibrium solution assumes that individuals are consuming entirely only the current revenue, so their wealth remains constant.

⁵The complementarity between the three goods is confirmed by reality, but is not essential for the model. The function can be adapted to account for allowing the substitution between the three goods. The main difference expected is a decrease of the supplementary demand for private goods when the company is involved in CSR activities, with an influence on the resulting cash flows.

In order to maximize the utility (1) obtained from the consumption of the private and public goods under the budget constraint (2), the following conditions become necessary:

$$\frac{U'_x}{P_x} = \frac{U'_y}{P_y} = \frac{U'_z}{P_z}. \quad (3)$$

In order to obtain maximal utility of the amount spent, the rational consumer will divide his/her budget in such a way that

$$\ln\left(\frac{x}{a} + 1\right) = \ln\left(\frac{y}{b} + 1\right) = \ln(z + 1), \text{ which results in } \frac{x}{a} = \frac{y}{b} = z \text{ equivalent to } x = az \text{ and } y = bz. \quad (4)$$

Condition (3) simply requires that the marginal utilities be proportional to the prices of the goods for the optimal consumption. Condition (4) gives the optimal quantities consumed, given that X , Y and Z are complementary goods.

Using the relation (1) to compute the marginal utilities, condition (3) conducts to: $\frac{\frac{1}{\frac{x}{a}+1} \cdot \frac{1}{a}}{p_x} = \frac{\frac{1}{\frac{y}{b}+1} \cdot \frac{1}{b}}{p_y} = \frac{\frac{1}{z+1}}{p_z}$. In other words, $\frac{1}{p_x} = \frac{1}{p_y} = \frac{1}{p_z}$ which leads to $\frac{p_x}{z+1} = \frac{p_z}{x+a}$ and $\frac{p_y}{z+1} = \frac{p_z}{y+b}$ and employing relation (4) we obtain:

$$ap_x = bp_y = p_z. \quad (5)$$

Introduced in the budgetary constraint (2), conditions (4) and (5) allow us to write the optimal quantities of goods consumed by a representative individual⁶:

$$z = \frac{R}{3p_z}, \quad x = a \frac{R}{3p_z} \text{ and } y = b \frac{R}{3p_z}. \quad (6)$$

⁶The equilibrium solution obtained corresponds to the voluntary contribution framework, which differs from the social optimum in most cases. However, for the condition of complementarity between the goods, the solution derived represents a Samuelsonian equilibrium (see Muller 2003).

Hence the total quantities of the three goods provided at community level, based on the property of joint supply of the public goods⁷ are: x with a unitary price equal to Np_x , y with a unitary price Np_y and Nz with a unitary price p_z .

The inefficient allocation of the public good can have two sources: (a) the public authorities provide one of the public goods at too high a price and the company can provide a part of this good at a lower price⁸, and (b) the quantity of the public goods provided is different from the optimum. The first situation may occur due to the lack of competition in the area or to the weak control of the public authorities. It also implies situations of government opportunism. The second may arise from the impossibility of the government to correctly anticipate the social needs or/and its inability to adapt in a short term.

4.1. Case (a): The Public Authorities Provide the Public Good at Too High a Price and the Company Can Provide a Part of it at a Lower Price

We analyze the opportunity of the decision of company E to provide a part of the public good (arbitrarily chosen to be Y) at a lower price, making an investment I . The optimal price p_{y_0} to which the supplementary quantity y_0 will be sold should be determined. The motivation of the company to intervene in the public good provision is its attempt to improve the provision of the public good Y which is inefficient; the best manner to interfere is to directly provide the good Y in a quantity y_0 which depends on its capacity. The response of the public authorities could be to cooperate, diminishing the quantity of the public good Y provided with the exact capacity of the company, or not to cooperate, continuing to produce the same quantities of the public goods in the same conditions as before the company entered the market. In the case of cooperation, the public authorities can agree to a public-private partnership. The authorities continue to raise taxes

⁷In the case of the public goods, their characteristic of joint supply makes the same quantity sufficient for simultaneous use by all the consumers, so they will finance the public good in equal proportion by paying an amount p each, the total unitary price of the good being Np .

⁸This hypothesis can be the result of government opportunism, but can also be the result of a technical inefficiency of the public sector that has yet not been overcome.

corresponding to the new total cost of the public goods provided and pay the due amount to the company or diminish the amount of taxes collected, producing less of the public good Y and let the consumers purchase the quantity of the public good Y from the company.

4.1.1. The status-quo situation

The status-quo situation describes the equilibrium solution in the market when the public good Y is provided at a price that is too high compared to the efficient provision solution.

The following hypotheses are considered: (H1) in a status-quo situation, the company E does not intervene in the production of the public good Y ; (H2) the government provides the public good X optimally, ensuring a price $p_{x_s} = p_x$; (H3) The public authority provides the public good Y inefficiently, resulting in the high price of the good Y : $p_{y_s} > p_y$ (p_x and p_y are those corresponding to an efficient provision framework); (H4) the company E provides the private good Z at a price $p_{z_s} = p_z$ and has no incentive to lower the price, knowing that the quantity consumed of the good Z depends on the consumption of the goods X and Y .

The status-quo situation (formally marked by subscript s) corresponds to a second best solution knowing that the efficient supply corresponding to the Pareto equilibrium cannot be reached because the price of the good Y required by public authorities is higher than p_{z_s}/b and $p_{x_s}(a/b)$. Hence the condition of the proportionality between marginal utilities and prices does not hold (see Lipsey, and Lancaster 1956).

Considering the same individual utility function (1) that has to be maximized under the budget constraint, the condition becomes: $x_s/a = y_s/b = z_s$, in other words $x_s = az_s$ and $y_s = bz_s$. The optimal quantities of goods consumed by an individual are the following:

$$\begin{aligned} z_s &= \frac{R}{ap_{x_s} + bp_{y_s} + p_{z_s}}; & x_s &= \frac{aR}{ap_{x_s} + bp_{y_s} + p_{z_s}}; \\ y_s &= \frac{bR}{ap_{x_s} + bp_{y_s} + p_{z_s}}. \end{aligned} \quad (7)$$

Hence the total quantities of the three goods provided for the community, based on the property of the public goods being non-rival in consumption are: x_s with a unitary price Np_{xs} , y_s with a unitary price Np_{ys} and Nz_s with a unitary price p_{zs} , respectively.

Company E will have the following profit: $\Pi = Nz_s (p_{zs} - c_z)$, where c_z is the unitary production cost of the good Z .

Company E analyzes the opportunity for investment I that will provide a quantity y_0 from the public good Y at a lower price than p_{ys} . The apostrophe marks the quantities of public and private goods and their average prices in the economy, if the company gets involved in the provision of the good Y . In addition, y_G denotes the quantity of the public good Y provided by public authorities at the price p_{ys} . Considering that the public good X is provided efficiently by public authorities and independently of the production of Y , its unitary price for the individual consumer is presumed to be equal to that in the status quo and the efficient supply situation: $p_x = p_{xs} = p_{x'}$.

The private company can charge the price for the quantity y_0 of the public good Y provided in one of the following ways: (1) a contract with the public authority for providing the public good, hence the payment being realized by authorities through the taxes raised from the individuals (this can only be possible under the assumption of a cooperative authority); (2) a direct provision of the public good to individuals, when it is possible; (3) an increase in the price of the private good Z to finance the provision of the public good Y under the assumption that the individuals accept the increase. For example, a company which decides to organize recurrent actions of cleaning an area can finance the operation directly by a contract with the public authority lowering the costs of the same publicly provided service. If the public authority is not interested in contracting the service from the company, the cost can be covered by increasing the price of the private good it produces, the customers being ready to pay the additional price as a reward for the cleaning service provided. For some categories of public goods such as providing children care for example, the company can charge the price or a part of it directly to the beneficiaries.

4.1.2. The equilibrium solution in the case of cooperative public authorities

We consider the case of a cooperative public authority adapting the decisions regarding the production of public goods and the tax policy to the new conditions. The hypothesis is in correlation with the active role of public authorities in sustaining CSR, as mentioned in Deakin and Hobbs (2007).

The cooperative authority will make the decisions necessary to maximize the social utility under the circumstances of the intervention of company E in producing the public good Y . Fiscal adjustments can also be arranged in order to allow the citizen to choose between the producers of the good Y , as well as adjustments in the quantities provided from the public goods according to the demand. In this case, the utility function maximization condition becomes $Max\{U(x', y', z')\}$, under the revenue restriction for consumers: $x' p_{x'} + y' p_{y'} + z' p_{z'} = R$,

where $y' = y_G + y_0$ and $p_{y'} = (y_G p_{y_s} + y_0 p_{y_0}) / (y_G + y_0) < p_{y_s}$.

Considering the representative utility function (1), the following conditions are imposed: $x' = az'$ and $y_G + y_0 = bz'$, leading to the equilibrium solution:

$$\begin{aligned} z' &= \frac{R}{ap_{x'} + bp_{y'} + p_{z'}} > z_s, \text{ for } p_{y'} < p_{y_s}, \\ x' &= \frac{aR}{ap_{x'} + bp_{y'} + p_{z'}} \text{ and } y' = \frac{bR}{ap_{x'} + bp_{y'} + p_{z'}}. \end{aligned} \quad (8)$$

By providing a supplementary quantity y_0 of the public good Y at a price p_{y_0} , the company influences the individual utility, hence determining the increase of the quantity demanded of the private good Z . The provision of the public good Y in quantity y_0 can also be a profit source for the company. The price of the public good Y that the company provides will be established by means of the offer and demand mechanism, assuming the total cooperation of the public authority. Depending on the quantity y_0 produced privately, the solution shall be optimal (corresponding to the efficient supply situation, if the company can provide all the quantity of the public good Y needed and it satisfied the technical efficiency condition in

producing the public good Y) or suboptimal (if it produces only a part of the quantity needed of the good Y or it does not comply with the technical efficiency assumption, but the solution is better than the status quo, conducive to an increase of the utility).

Considering the condition of profit maximization, the decision is rational only if it results in a profit increase big enough to justify the initial investment I that the company assumes in order to produce the public good Y :

$$\Delta\Pi = Nz'(p_{z'} - c_z) + y_0(Np_{y_0} - c_{y_0}) - Nz_s(p_{z_s} - c_z). \quad (9)$$

$$\text{Since } p_{z'} = p_{z_s} = p_z, \Delta\Pi = N(z' - z)(p_z - c_z) + y_0(Np_{y_0} - c_{y_0}) > 0$$

and the rationality of the enterprise involved in the production of the good Y is obvious from a financial point of view, if the initial investment is covered (for a detailed discussion on the subject see Dragotă and Dragotă 2009; Bellalah et al. 2012).

4.1.3. The equilibrium solution in the situation of non-cooperative public authorities

A non-cooperative public authority would collect the same amount of financial resources $x_s p_{x_s} + y_s p_{y_s}$, independently of the supplementary quantity y_0 provided by private companies and use it to provide the same quantities from the goods X and Y . The increase in the profit of company E providing an additional quantity of the good Y can only appear in the case of a sharp need of public good Y , (if it was also insufficient) exclusively by means of the public good Y production, which makes us wonder about the CSR character of the investment.

If the company provides the good Y freely, the quantity z' shall be the same ($z' = z_s$) due to the consumers' budgetary restriction. The profit shall be reduced compared to the status quo situation with the investment I realized in order to produce the quantity y_0 and the cost of the good Y . The decision of getting involved in CSR activities cannot thus be justified in the case of a non-cooperative public authority from the shareholder theory standpoint.

4.2. Case(b): The Quantity of the Public Goods Provided by Public Authorities Is Different from the Optimum

In the case of a bad allocation of resources in the production of the public goods, the problem can be formalized in the production of a too low quantity of the public good Y , which limits the utility of the final beneficiaries. The company can improve the equilibrium by providing directly supplementary quantities of the public good(s) which is (are) insufficient or by financing their production, depending on the nature of the constraints of the public sector.

Using the same framework as above, the public authority provides the quantities x_s and y_s , the latter being insufficient. Thus $Min(x_s/a, y_s/b, z_s) = y_s/b$.

We also consider the constraining hypothesis that the public authority does not provide supplementary quantities of the two public goods, due to technical restrictions or because the community does not have the means to induce a public decision of increasing the quantity produced of the good Y . The corresponding status quo situation is presented below.

4.2.1. The status-quo situation

The hypotheses of the status-quo situation in this case are the following: (H1) the company E does not intervene in the production of the public good Y ; (H2) the government provides the public goods X and Y optimally from the technical point of view, ensuring a price $p_{x_s} = p_x$, and $p_{y_s} = p_y$, where p_x and p_y are those from the efficient supply Paretian equilibrium; (H3) company E produces the private good Z at a price $p_{z_s} = p_z$ and has no incentive to increase the price due to the perfect competition assumed in the market; (H4) the government provides a too low quantity of the good Y .

Using the condition of utility maximization (1) : $Max\{U(x_s, y_s, z_s)\}$, the rational behaviour of a representative consumer would be to consume a quantity of the good Z equal to $z_s = y_s / b$, under the budget constraint (2): $x_s p_{x_s} + y_s p_{y_s} + z_s p_{z_s} \leq R$. In this particular case, it is assumed that individuals can consume only a part of their current revenue, thus increasing

their wealth. The decision is rational because consuming the surplus of revenue would not bring any supplementary individual utility.

Considering that the three goods are produced at the optimal prices p_x , p_y , p_z , the marginal utilities are proportional to the unitary prices, which leads to:

$$ap_x = bp_y = p_z \quad (10)$$

and the budget constraint becomes:

$$x_s p_x + y_s p_y + z_s p_z \leq R \quad (11)$$

or

$$x_s \frac{p_z}{a} + y_s \frac{p_z}{b} + z_s p_z \leq R. \quad (12)$$

The assumption that the quantity y_s is suboptimal leads to the conclusion that the quantity z_s is also suboptimal, the profit of the company E being

$$Nz_s (p_z - c_z) \quad (13)$$

or

$$N \frac{y_s}{b} (p_z - c_z). \quad (14)$$

An increase of the price of the good Z is not possible if we assume the perfect competition condition. In the case of an oligopoly, certain small increases of the price may be taken into account, but the existence of the CSR may endanger the equilibrium in the absence of a coordinated behaviour of the companies, which is prohibited by the competition laws. Company E can decide to provide a supplementary quantity y_0 of the good Y at a unitary price p_y , making an investment I .

The intervention of company E may consist in the direct provision of the public good(s) that is (are) insufficient or in financing the provision of the supplementary quantity needed by the public authorities.

4.2.2. The equilibrium solution with cooperative public authorities

The public authority is expected to make the necessary tax adjustment in order to allow a higher quantity of private good Z to be consumed, and if necessary, to adjust the quantity of the good X provided. The solution is

given by: $Max\{U(x', y', z')\}$, for $y' = y_s + y_0$, resulting in the necessary cumulative conditions $x' = az'$ and $y_G + y_0 = bz'$, under the budget constraint: $x'p_x + y'p_y + z'p_z \leq R$ and $ap_x = bp_y = p_z$.

The quantities provided of the goods Z and X will be:

$$z' = y'/b \text{ and } x' = ay'/b, \text{ under the assumption that } y_0 \leq bR/(3p_z) - y_s.$$

When $y_0 = bR/(3p_z) - y_s$, the conditions of the Pareto optimum equilibrium are fulfilled.

The profit of company E is:

$$\Pi = \frac{y'}{b}(p_z - c_z) + (y' - y_s)(p_y - c_y). \quad (15)$$

Assuming that the public authority does not seek for profit maximization and provides the public goods at their cost, the profit of company E is

$$\Pi = \frac{y'}{b}(p_z - c_z). \quad (16)$$

The increase of the profit compared to the status-quo situation is positive:

$$\Delta\Pi = N\frac{y'}{b}(p_z - c_z) - N\frac{y_s}{b}(p_z - c_z) = N\frac{y_0}{b}(p_z - c_z). \quad (17)$$

Considering the form of the dependence of investment I on quantity y_0 of public good Y that the company will provide, the utility function form and the technical restrictions regarding quantity y_0 , the optimum can be attained or a sub-optimal solution more favourable than the status-quo can be obtained.

According to the corporate finance theory, the company decides to invest only if the supplementary profit will lead to a sufficiently high cash flow to justify the investment cost. If the mentioned condition is not fulfilled, the decision will be not to implement the CSR activity.

4.2.3. The equilibrium solution for non-cooperative public authorities

For a non-cooperative public authority, neither the amount of taxes collected is expected to alter, nor the quantity of public good X provided (x_s). The only possibility of increasing the aggregate utility is to raise the quantity of public good Y , by providing an additional quantity y_0 .

The solution implies the following simultaneous conditions:

$$\begin{aligned} \text{Max}\{U(x', y', z')\} = \\ \text{Max}\left\{\text{Min}\left[\ln\left(\frac{x_s}{a}+1\right), \ln\left(\frac{y'}{b}+1\right), \ln(z'+1)\right]\right\} = \ln\left(\frac{y'}{b}+1\right) = \ln(z'+1) \end{aligned} \quad (18)$$

for

$$y' = y_s + y_0 \quad (19)$$

$$x_s p_x + y' p_y + z' p_z \leq R \quad (20)$$

$$ap_x = bp_y = p_z$$

and

$$y'/b = z'. \quad (21)$$

Hence:

$$x_s \frac{p_z}{a} + y' \frac{p_z}{b} + z' p_z \leq R. \quad (22)$$

If company E can provide the entire quantity $y_0 = zb - y_s = Rb / (3p_z) - y_s$ and x_s is the optimal quantity $x = Ra / (3p_z)$, then the solution is the optimal one.

If x_s is different from the optimum but higher than $y_s a / b$, a suboptimal solution is obtained under the constraints of the technical limits in providing quantity y_0 and quantity x_s available. However, the solution is more favourable than the status-quo from the point of view of the individual consumers.

The decision of company E to invest in the CSR activity depends on the investment I necessary in order to produce the good Y and on the capacity of the supplementary cash flow obtained on the grounds of the increase in profits $\Delta\Pi = (z' - z_s)(p_z - c_z)$ of covering investment I .

If the status-quo quantity of good X provided (x_s) is settled in such a manner that $x_s p_x + y_s p_y + z_s p_z = R$ (the quantity of good X is higher than the optimum or X is produced at too high a price), then from the budget restriction constraint it is obvious that the quantity z' provided is lower than the quantity in the non-equilibrium initial state. So the company will see its profit diminish, not being stimulated to invest in CSR activities.

5. DISCUSSION

To conclude, the model exemplifies how the decision-making process regarding the involvement of companies in CSR activities should take into account the behaviour of public authorities. It is also a theoretical instrument to illustrate the market response to the CSR activities of the companies.

The decision-makers will study the cost of the investment to produce the public goods and determine the opportunity of undertaking corporate social action. We emphasize once more that our model does not exclude the other motivations of companies to get involved in CSR, such as responding to the will of its caring shareholders, for example. It is designed to demonstrate how public authorities can influence the economic incentives of the enterprises to undertake socially responsible actions.

The main decision tools to be taken into consideration are:

- the form of the dependence of the total value invested I on the quantity of public good Y that the company produces (y_0), which influences the amount of the necessary investment I .
- the parameters of the utility function (a and b) and in a more general case, the form of the utility function and the complementarity between the goods considered in the consumption decision. The particular form of the utility function has implications on the relation between the quantities consumed of the three goods. The complementarity between the three goods enhances the incentive of the company to invest in CSR.⁹
- the degree of cooperation of the public authority and the period it needs to enact the adjustments, which will result in variations of the incremental profit, with an impact on the efficiency of the CSR investment. In the long run, a cooperative authority is expected to eliminate its inefficiency sources. Therefore the intervention of private companies in providing public goods should be temporary. This period is also important in the investment decision. It should be compared to the payback period. A cooperative public authority is expected to reveal the parameters mentioned above, when known, hence limiting the uncertainty sources for the company. The cooperative behaviour of the

⁹If the goods are considered substitutable, the utility may be modelled as a Cobb-Douglas function (for example). The decision of the companies to provide public goods is made identically, but the incentives to invest are expected to be lower (a lower increase in profits is anticipated).

public authority also allows the CSR actions to signal public sector inefficiencies. A public authority preoccupied with maximizing the social utility of the community will encourage the CSR actions to identify its allocative inefficiency sources.

After finding the form of the two functions specified above, the optimal price of good Y that the company provides is established in the market, under the constraint of the capacity of the company to produce it (y_0).

According to corporate finance theory, the economic incentives for implementing CSR investment appear if the incremental cash flows cover the initial investment.

The readers may have observed by now that the same assumptions and analysis can be used for every situation when a private company provides public goods. In fact CSR is a special situation of privately provided public goods and the approach above can certainly be extended for every situation of the private provision of public goods. Intuitively, the specificity of CSR actions follows from two sources. First, the voluntary character of CSR actions does not imply a previous formal agreement with a public authority and introduces the uncertainty of the response of the public authority. Second, the CSR actions do not imply a compulsory search for direct profits resulting from the initiatives undertaken, but they can be obtained indirectly. The model provided was designed to take into account these assumptions, but it can be easily modified in order to be used for analyzing other situations of the private provision of public goods.

The model presented was conceived to exemplify the role of public authorities in modifying the economic incentives for the companies to get involved in CSR. It is not, in this form, a practical tool to evaluate corporate socially responsible investment due to its limits presented below.

First, it does not take into account consumer preferences for CSR. Our model considers that all consumers have identical utility functions. A better reflection of the reality would be to consider two categories of investors: the caring ones and the neutral ones. We expect that this situation would weaken the economic incentives towards CSR proportionally with the percentage of neutral investors among the consumers.

Second, it does not deal with the heterogeneity of private goods. Although not necessary in our simple model, it certainly needs to be studied in detail when analyzing the opportunity of implementing a particular CSR project. A possible extension of the model including a higher number of private and public goods can also be envisaged.

Third, the consumers in our models were supposed to consider infinite time horizons when making their decisions. A possible extension would be to consider a finite time span. Although it is not expected to impact the main conclusion of the paper, such an alternative model may be more appropriate for practical analyses and is expected to diminish the economic incentives towards CSR actions, especially for short time horizons.

CONCLUSIONS

The paper deals with the fundamentals of the corporate decision of implementing social responsible investments and with the response of public authorities to CSR initiatives. The cooperative or non-cooperative attitude of public institutions regarding corporate social responsible actions is proved to influence the economic incentives of the CSR projects.

The main conclusion of the paper is that the behaviour of public authorities needs to be explored when assessing the opportunity of a CSR investment.

In the context of no clear empirical evidence on the economic role of CSR investment on the performance of the companies, we emphasize a possible economic motivation for companies adopting CSR. The explanation is related to the need to deal with the inefficiency of public authorities in providing public goods known as being complementary to the private ones. A simple economic model is provided to study the decision of companies to develop CSR actions. This explains the conditions that need to be fulfilled for the company to undertake social and environmental investment. The contribution of the model in practice is that it encourages considering the behaviour of public authorities when determining the cash flows of social responsible investment projects.

On the other hand, it also emphasizes the effect of the public policy on the development of corporate social responsibility. Namely, the cooperative behaviour of public institutions regarding social responsible initiatives of the companies increases the resulting cash flows and favours the adoption of the projects. The conclusions of the study are equally important for designing suitable public policy in order to encourage corporate social responsible actions.

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