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A Theoretical Underpinning of the Relationship between Corporate Social Performance and Stock Returns

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Abstract: We present a model of an asset market in which socially responsible investors with their perception of corporate social responsibility (CSR) affect the price of individual assets and, consequently, the expected returns. The simultaneous reactions of socially responsible and conventional investors would result in a higher expected return for the socially responsible assets and a higher expected utility for socially responsible investors. Our results show that through the process of learning and "imitation", the impact of CSR on the financial performance of socially responsible investors can be reduced to a relatively lower level compared to the situation of absence of imitation.

Keywords: corporate social performance; socially responsible investments; socially responsible stocks; asset pricing

JEL codes: G11, G19, M14

1. Introduction

Corporate social responsibility (CSR) and its relation to financial performance (FP) have received growing attention from firms' managers and investors and an increasing number of firms have undertaken efforts to integrate CSR into their decision-making process (Harjoto & Jo, 2007; El Ghoul, Guedhami, Kwok, & Mishra, 2011). Social issues such as environment and employees' welfare have become increasingly important in investment decisions over the past two decades (Shalchian et al., 2012). The main question has revolved around whether there is a premium or a penalty associated with such investments (Goss & Roberts, 2011). Many scholars have investigated the relation between corporate social performance (CSP) and financial performance in recent years, but the results remain divergent. While a number of studies have found a negative correlation between CSP and FP (Vance, 1975; Moore, 2001), others have been inconclusive (Abott & Monsen, 1979; Newgren, Rasher, LaRoe, & Szabo, 1985). Even though the majority of studies find a positive relation between social and financial performance (Cowen, Ferreri, & Parker, 1987; Waddock & Graves, 1994; Frooman, 1997; Preston & O'Bannon, 1997; Ruf, Muralidhar, Brown, Janney, & Paul, 2001; Orlitzky, Schmidt, & Rynes 2004; Derwall, Guestner, Bauer,

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& Koedijk, 2005; Shalchian, M'Zali, Paquet, & Ouenniche, 2006; Shalchian, M'Zali, Elbadraoui, & Lilti, 2012), academics and practitioners should be concerned about the divergence of the results.

As pointed out by Tebini (2012), the conflicting results in prior studies are mainly attributable to differences in the approaches and methods used by the authors. Furthermore, Griffin and Mahon (1997) suggest that the controversy in the literature is partly the result of an insufficient theoretical framework for the subject. Shalchian, M'Zali, Paquet and Ouenniche (2006), through a portfolio analysis, brought an improvement to the theoretical framework by investigating the relation between CSP and investor's financial performance. In this paper, using classical theories in finance and economics, we attempt to add bring an improvement to the theoretical framework on the relation between CSP and stock performance by considering the process of "learning" and "imitation" among investors. More specifically, we use theories of intertemporal substitution (Cochrane, 2001) and signals (Jones & Murrell, 2001) in order to integrate CSP into the utility function of a representative investor whose desire is to allocate his consumption between two periods in an economy containing two risky assets (Epstein & Zin, 1989; Hindy & Huang, 1993; Cochrane, 2001). The representative investor reduces his present consumption in order to invest in one individual asset which will eventually bring him additional income and consequently increase his future consumption. Following Shalchian, M'Zali, Paquet and Ouenniche (2006), we suppose the presence of two types of investors on the market. The first type is the "conventional investor" who considers traditional information in his decision making process. The second type, the "socially responsible investor", treats CSP as a signal and incorporates this information with other information while making his investment's decisions.

We also assume that shares issued by a socially responsible firm behave like "multi-character durable goods". In economic theory, durable goods and financial assets can be thought as sharing a common characteristic (Grossman & Laroque, 1990). Both items are purchased at a given moment in time but they provide utility for their holders at a moment in the future. Further, Detemple and Giannikos (1996) argue that a category of durable goods called "multi-character durable goods" fulfill multiple needs. On one hand, they provide services through their usage and therefore utility over extended periods of time (Ogaki & Reinhart, 1998). On the other hand, they also provide additional utility in the form of status. The additional utility is revealed as a feeling of pride or social prestige. Detemple and Zapatero (1992) suggest that perhaps status is the dominant function of items such as luxury cars or fashionable clothes. Therefore, the additional value that consumers grant to multi-character durable goods is the present value of the additional utility that they anticipate to obtain from these products.

In this paper, we consider assets issued by a socially responsible firm as multi-character financial assets providing not only a future utility of usage in terms of expected return but also as additional expected utility provided by a firm's social performance. Our conceptual framework is based on our observation of socially responsible investors who assign additional worth to the stocks of socially responsible companies. Since the price represents the present value of an amount of future utility perceived by the investors, it is therefore logical to consider the additional value that socially responsible investors attribute to socially responsible firms as the present value of additional future utility that they anticipate to obtain by holding the assets issued by socially responsible firms. We develop the model from representative agents with identical initial wealth, an identical coefficient of risk aversion and identical anticipations concerning assets, except for CSP. Socially responsible investors are capable of receiving, analyzing and incorporating all information concerning CSP into their decision-making process and consequently, into the assets' prices. Conventional investors, however, receive the information concerning CSP but ignore this information or do not have the capacity to analyze and incorporate the signal into the asset prices.

Finally, we examine the process of learning and imitation among investors. Bonabeau (2004) identifies four principal drivers of imitation in economic agents. The first driver is safety. Following others does not make an investor the pioneer but it gives him the reassurance that he would not be the only one making a wrong decision. The second driver of imitation is *conformity* which would create a feeling of *being accepted* by the others in the investor group. The third driver of imitation is the *belief that the other person knows better.* Finally, *greed* drives an investor to imitate another because he desires the same success. Hence, we also consider further a second generation of investors consisting of some conventional investors who have learned from the previous generation's financial performance and who adjust their behavior accordingly.

This paper is organized as follows. In section II, we present our model and we analyze the investors' behavior and their reaction to CSR. In section III, we examine the impact of CSR on the expected return of stocks as well as on the perceived risk. In section IV, we consider the impact of imitation on asset prices and expected returns, while we summarize our findings in section V.

2. The Model

We analyze the investors' behavior with respect to CSR using a stripped-down overlapping generations model (Samuelson, 1958; De Long, Shleifer, Summers, & Waldmann, 1990). We suppose the presence of two types of one-period-lived agents on the market, who desire to hold one single asset during their life-time. The first type of agent is the "socially responsible investor" who considers "corporate social performance" as a signal with respect to an investment's future utility. A socially responsible investor makes his decisions concerning investments based on CSP as well as on the traditionally used financial information, such as profits and various ratios. As a result, CSP encourages the socially responsible investor to take additional future utility into account and to express preferences for the asset issued by a socially responsible firm. The second type of investor is the "conventional investor" who does not give any weight to information about the CSP. Therefore, a conventional investor does not incorporate this signal into the prices of the stocks but makes decisions with regard to investments based on traditional information (financial signals). In other words, both types of investors face the same set of information about the future value of their investments, but the difference lies in the response or, equivalently, the extent to which they weight each type of information.

To analyze the behavior of both categories of investors, we compare two different economies, identical on all points except for the CSP. In the first economy, there is no corporate social performance perceived by any type of investor and decisions are made based only on "financial" information. In the second economy, the socially responsible investor perceives and incorporates the CSP in his investment decision and consequently in the price of the assets.

2.1 Demand Functions

Our basic model is derived from a first-generation representative agent (consumer/investor) framework with a one-period life-time. For simplification purposes, we abstract from labor supply decisions and we suppose that there is no previous periods' consumption. The only decision agents make pertains to the choice of an individual asset at the beginning of the period. We also assume that there is no injection or withdrawal of capital during this period. The agents take a position on one single asset at the beginning of the period and liquidate their position at the end.

We assume that there are two risky assets (labeled i and j) in the economy with identical characteristics

except for their social performance. Assets are issued by two companies from the same industry, same size, same profitability. Both assets are in perfectly inelastic supply in fixed quantities, normalized to one unit. They have the same expected cash flow, $\hat{x}_i = \hat{x}_j$, that represents the sum of the anticipated prices, $\hat{p}_i$ and $\hat{p}_j$ with respective anticipated dividends, $\hat{d}_i$ and $\hat{d}_j$. They also exhibit the same expected risk, measured by the historic variance, $\hat{\sigma}_i^2 = \hat{\sigma}_j^2$, and consequently have the same required return, $r_t^i = r_t^j$. If the price of each asset is equal to the net present value of its cash flow, then assets *i* and *j* would be perfect substitutes and would sell for the same price, $p_t^i = p_t^j$. Since the assets are here perceived as perfect substitutes, both types of investors would be indifferent with regard to assets *i* and *j* and would randomly choose either one.

There are also two types of agents. Socially responsible investors (denoted S) receive and take into account the information with respect to CSP as well as the traditional signals. However, conventional investors (denoted C) receive and only take the traditional signals into account. We assume that the proportion of socially responsible investors is measured by η^s, so that the proportion of conventional investors is given by η^C, with $\eta^c = 1 - \eta^s$. Both types of investors choose one of the assets at the beginning of the period *t* to maximize their respective expected utility given their beliefs about the *ex-ante* mean of the distribution of the end-of-period cash flows of the assets.

The investor's utility is a constant absolute risk aversion function of wealth at the end of the period

$$U = -e^{-2\gamma[(1+\theta)x]} \tag{1}$$

Where γ denotes the coefficient of absolute risk aversion and $\theta \cdot x$ is the dollar value attributed by the investor to the future utility that he anticipates CSP will provide. We suppose that θ is exogenous and known by the investor *S* at the beginning of the period. In an economy with no weight attributed to CSP perceived by any investor, the value of θ equals zero. Assuming that returns follow a normal distribution, the maximization of the expected wealth in (1) would be the equivalent to maximizing

$$\overline{x} - \gamma\sigma_x^2 \tag{2}$$

Where *x* represents the expected cash flow at the end of the period, and σ_x^2 is the variance of the end-of-period cash flow. Supposing that the historic variance is an appropriate measure of future fluctuations of final wealth, the risk of the end-of-period wealth would be:

$$\sigma_x^2 = \sum_{t=1}^{T} (x_t - \overline{x})^2 / (T-1) \tag{3}$$

Therefore, at the beginning-of-the period, both investors choose to hold one of the assets to maximize:

$$E(U) = c_0 + \lambda_i \left[(1+\theta)\,\hat{x}_i - p_i\,(1+r_i)\right] - \gamma\,\lambda_i^2\,\hat{\sigma}_x^2 \tag{4}$$

Where λ_i denotes the amount of the asset "i" that the investor desires to hold, $\hat{x}_i$ the anticipated cash flow and $\hat{x}_i = \hat{p}_i + \hat{d}_i$.

In the absence of all perception of CSP ($\theta = 0$), all investors make their decisions at the beginning of the investment period so as to maximize their expected utility:

$$E(U) = c_0 + \lambda_i\left[\hat{x}_i - p_i(1+r_i)\right] - \gamma.\lambda_i^2.\hat{\sigma}_x^2 \tag{5}$$

Using the first-order optimality conditions, the holdings of assets *i* and *j* that maximize the expected utility of investors are:

$$\lambda_t^{i,s} = \lambda_t^{i,c} = \frac{\hat{\rho}_i}{2\gamma \cdot \hat{\sigma}_i^2} \tag{6}$$

$$\lambda_t^{j,s} = \lambda_t^{j,c} = \frac{\hat{\rho}_j}{2\gamma \cdot \hat{\sigma}_j^2} \tag{7}$$

Where $\hat{\rho}_i = \hat{x}_i - p_i(1+r_i)$ and $\hat{\rho}_j = \hat{x}_j - p_j(1+r_j)$. Under the assumption of a normal distribution of the returns, the optimal demands for the assets are proportional to the expected returns and inversely proportional to the perceived risk. The variance of the asset's return appearing in the denominators of the demand functions shows that both investors limit their demands for risky assets because the prices at which they can sell the assets at the end of the period depend on their uncertain beliefs.

2.2 Price Functions and Expected Returns

To estimate the assets' equilibrium prices, we suppose that the investors liquidate their positions at the end of the period. Equations (6) and (7) lead to following optimal prices:

$$p_i = \frac{\hat{x}_i - 2\gamma.\hat{\sigma}_i^2}{(1+r_i)} \tag{8}$$

$$p_j = \frac{\hat{x}_j - 2\gamma.\hat{\sigma}_j^2}{(1+r_j)} \tag{9}$$

Equations (8) and (9) show the equilibrium prices of assets *i* and *j* as functions of their associated required return (r_i and r_j), the coefficient of absolute risk aversion (γ), and of the moments of the one-period-ahead distributions of $\hat{x}_i$ and $\hat{x}_j$. Moreover, under the assumption that the assets *i* and *j* are perfect substitutes, the expected returns of the two assets at the beginning of the period will be identical.

$$E(R_t^i) = (\hat{x}_i / p_i) - 1 \tag{10}$$

$$E(R_t^j) = (\hat{x}_j / p_j) - 1 \tag{11}$$

Equations (10) and (11) show that, in the absence of any perception concerning CSP and under assumption of perfect substitution, both assets provide identical combinations of expected risk/return and consequently, an identical amount of utility for the investors. Both types of investor would be entirely indifferent in their choice between assets *i* and *j*. Therefore, they randomly choose either one. Consequently, at equilibrium, half of the investors in each category would choose to hold each of the assets.

3. The Impact of Corporate Social Performance on the Investment Decision

In this section, we consider a second economy where firm *i* is perceived by investor S as socially responsible. Consequently investor S receives additional utility from asset *i* and shows a particular interest in this firm's stocks. From the conventional investor's perspective, as CSP is being neglected or misunderstood, this information would have no impact on his perception. Given his beliefs, investor S decides to substitute asset *i* for asset *j*. In other words, CSP encourages the socially responsible investor to develop a relative preference and demand for asset *i* in order to obtain the additional utility associated with the CSP.

3.1 The Demand Functions

The socially responsible investor's perception of CSP from firm *i* leads him to grant a positive value to θ in Equation (1). We assume that the investor measures this value correctly, taking into consideration all costs related to the CSP. The expected utility of investor S is expressed as follow:

$$E(U) = c_0 + \lambda_t^i \left[(1+\theta) \cdot \hat{x}_i - p_t^i (1+r_t^i) \right] - \gamma (\lambda_t^i)^2 \cdot (1+\theta)^2 \cdot \hat{\sigma}_i^2 \tag{12}$$

We define $\theta \cdot \hat{x}_i$ as the dollar value that the socially responsible investor attributes to the future utility that he

expects to obtain from the *CSP.* Equation (12) shows that CSP perceived by investor S affects the return and risk of the stock. Solving (12) for investor S's optimal holdings of asset *i*, we obtain:

$$\lambda_t^{i,s} = \frac{\hat{\rho}_i + \theta \cdot \hat{x}_i}{2\gamma \cdot \hat{\sigma}_i^2 + 2\gamma \cdot (\theta^2 + 2\theta) \cdot \hat{\sigma}_i^2} \tag{13}$$

The purchased quantity λ_t^i of asset *i*is a function of its price, the one-period-ahead distributions of the cash flow, and the dollar value of CSP perceived by investor S. Once again, under the assumption of a normal distribution of returns, the optimal demand for the asset is proportional to its expected return and inversely proportional to the perceived risk of the asset. As in the first economy, the variance of the asset's return in the denominator of the demand function indicates that the investor limits his demand for risky assets because the prices at which they can be sold at the end of the period depend on their uncertain beliefs. Yet, since θ appears in the denominator, it affects the uncertainty concerning the end-of-period prices. Since the CSP affects both the return and the risk of asset *i*, the necessary and sufficient condition for the demand of investor S to be higher for asset *i* (lower for *j*) in comparison with the first economy is that the variation of the return must be superior to the variation of the perceived risk:

$$\frac{\theta \cdot \hat{x}_i}{2\gamma \cdot (\theta + 2) \cdot \hat{\sigma}_i^2} > 1 \quad \Leftrightarrow \Delta \lambda_i^S > 0 \ . \tag{14}$$

If the ratio in Equation (14) is superior to 1, the perception of CSP would increase (decrease) the demand of asset *i* (asset *j*) by investor S. We can also assert that the increase in the demand for asset *i* depends on the dollar value that investor S attributes to CSP and, at an aggregate level, on the proportion of investors S who are present in the market. If condition (14) holds, socially responsible investors who hold asset *j* would decide to substitute it for asset *i*, which would decrease the demand for asset *j*:

$$\lambda_t^{j,s} = \frac{\hat{\rho}_i - \theta \cdot \hat{x}_i}{2\gamma \cdot \hat{\sigma}_i^2 - 2\gamma \cdot (\theta^2 + 2\theta) \cdot \hat{\sigma}_i^2} \tag{15}$$

Equation (15) shows that the increase of demand for asset *i* would translate into a simultaneous and proportional decrease of demand for asset *j* relative to what we estimated in the first economy in the absence of any perception about CSP.

3.2 Price Functions and Expected Returns

The socially responsible investor's decision to hold *i* instead of *j* results in a higher price to asset i (p_i^s). At this stage, the socially responsible investor discounts the total utility that he anticipates to obtain from asset *i*. The demand functions imply that

$$p_{i,s} = \frac{(1+\theta)\hat{x}_i - 2\gamma \left(\hat{\sigma}_i^2 + (\theta^2 + 2\theta)\hat{\sigma}_i^2\right)}{(1+r_i)} \tag{16}$$

Subtracting Equation (8) from Equation (16), we can estimate the additional price investor S is willing to pay for asset *i* (the net present value of the additional future utility anticipated by investor S). Once again, if the ratio expected return/risk in Equation (14) is satisfied, the additional price will be strictly positive.

$$p_{i,s} - p_i = \frac{\theta \cdot \hat{x}_i - 2\gamma \cdot (\theta^2 + 2\theta) \cdot \hat{\sigma}_i^2}{(1+r_i)} \tag{17}$$

Following the reaction of socially responsible investors to CSP, the market prices of the assets will be the weighted average of the prices granted by both types of investors. Thus, the respective prices of assets *i* and *j* are:

$$\tilde{p}_i = \frac{\hat{x}_i - 2\gamma \cdot \hat{\sigma}_i^2}{(1+r_i)} + \frac{(\eta^S / 2)\left(\theta \cdot \hat{x}_i - 2\gamma(\theta^2 + 2\theta)\hat{\sigma}_i^2\right)}{(1+r_i)} \tag{18}$$

$$\tilde{p}_j = \frac{\hat{x}_j - 2\gamma \cdot \hat{\sigma}_j^2}{(1+r_j)} - \frac{(\eta^S / 2)\left(\theta \cdot \hat{x}_j - 2\gamma(\theta^2 + 2\theta)\hat{\sigma}_j^2\right)}{(1+r_j)} \tag{19}$$

In Equations (18) and (19), the first terms represent, respectively, the prices of assets *i* and *j* in the absence of any perceived CSP (Equations (8) and (9)) and the second terms reflect the impact of CSP on these prices. Note that the impact depends on the value of θ and the proportion of the investors of type S present on the market. If condition (14) holds, the second term is positive for *i* (negative for *j*). In other words, the reaction of the socially responsible investors to the CSP results in a higher price for asset *i* (lower price for asset *j*). *Ceteris paribus*, this reaction results in a lower expected return for asset i (higher expected return for asset j)

$$E(\tilde{R}_i) = \left(\hat{x}_i / \tilde{p}_i\right) - 1 \tag{20}$$

$$E(\tilde{R}_j) = \left(\hat{x}_j / \tilde{p}_j\right) - 1 \tag{21}$$

Comparing Equation (20) and Equation (21), we can conclude that

$$\tilde{p}_i > \tilde{p}_j \Rightarrow E(\tilde{R}_i) < E(\tilde{R}_j) \tag{22}$$

At this stage, we can interpret the behavior of the socially responsible investor as substituting utility in form of "service" for utility in form of "status". The socially responsible investor is ready to sacrifice part of his utility stemming from the financial return in order to obtain a different form of utility from CSP.

From the conventional investor's viewpoint, preoccupied as he is with financial factors, the difference in expected returns is perceived as a signal that makes him favor asset *j* by substituting asset *i* for asset *j*. This simultaneous investment decision by the conventional investor would result in new equilibrium prices for both assets:

$$p_i^* = \frac{\hat{x}_i - 2\gamma \cdot \hat{\sigma}_i^2}{(1+r_i)} + \frac{((\eta^s - \eta^c)/2) \cdot \left(\theta \cdot \hat{x}_i - 2\gamma \cdot (\theta^2 + 2\theta) \cdot \hat{\sigma}_i^2\right)}{(1+r_i)} \tag{23}$$

$$p_j^* = \frac{\hat{x}_j - 2\gamma \cdot \hat{\sigma}_j^2}{(1+r_j)} + \frac{((\eta^c - \eta^s)/2) \cdot \left(\theta \cdot \hat{x}_j - 2\gamma \cdot (\theta^2 + 2\theta) \cdot \hat{\sigma}_j^2\right)}{(1+r_j)} \tag{24}$$

In the equilibrium price functions, the first terms represent the price of the assets in the absence of any perceptions with regard to CSP; the second terms represent the enhanced prices after the simultaneous reactions of both types of investors. The analysis of the final equilibrium prices reveals that they depend on the value of θ as well as the respective proportions (or the gap between respective proportions) of investors S and C in the market. If $\eta^s = \eta^c$, the difference of prices from those in the first universe would be zero and the estimated prices of *i* and *j* would be, respectively, identical to those estimated in the absence of perceived CSP. In other words, the reaction of the socially responsible investors to the CSP would be entirely neutralized by the reaction of the conventional investors to the higher expected return. On the other hand, if $\eta^s > \eta^c$, the second term would be positive for asset *i* (negative for asset *j*). This shows that the socially responsible investors' impact on prices would be superior to that of the conventional investors. In this case, the final equilibrium price of asset *i* would be superior to that of asset *j*. Finally, if $\eta^s < \eta^c$, the second term would be negative for asset *i* (positive for asset *j*). The socially responsible investors' impact on the price of the assets would be inferior to that of the conventional investors. In this case, the final equilibrium price of asset *i* would be inferior to that of asset *j*.

It seems plausible that the third scenario ($\eta^s < \eta^c$) is more likely to prevail, so in the final equilibrium, we

would have $p_i^* < p_j^*$. This difference of prices results in a difference in the expected returns of the two assets. Thus, in the final equilibrium:

$$p_i^* < p_j^* \Leftrightarrow E(R_i^*) > E(R_j^*) \tag{25}$$

In equilibrium with conventional investors, the expected return on asset *i* would be superior to that of asset *j*. In other words, the simultaneous reaction of the conventional investors combined with their seemingly higher proportion on the market results in a relatively higher expected return for the assets issued by a socially responsible firm.

4. Imitation

In this section, we consider the process of "learning" followed by "imitation" among the investors in their process of decision-making. It has been suggested in the literature that the process of imitation among investors is partly responsible for individual assets' prices and their volatility: *The increasing volatility of individual stocks has been attributed, in part, to the rise of institutional ownership and the tendency of those investors to make decisions in a similar way* (Bonabeau, 2004). Similarly, Makowiec, Gnacinski, and Miklaszewski (2004) argue that the mechanism of the amplified imitation could be responsible for some price movements on emerging stock markets. Therefore, we suppose a second generation of the both socially responsible and conventional of investors, with some conventional investors learning about the financial success of socially responsible investors in the previous generation and adopting the same behavior. As for the rest of the conventional investors, they pursue the same exact behavior as the previous generation. As a result, the proportion of socially responsible investors of the second generation is higher than the first generation by ($\Delta\eta^s$) while the proportion of conventional investors is lower by the same percentage.

In the first economy, in the absence of all perception of CSP by both types of investors, the demand and price functions for both assets will be the same as in the previous generation (Equations (5) to (11)). We suppose that the dollar value attributed by the socially responsible investor to the additional utility that he receives from CSP remains the same in the second generation. Therefore, in the second economy, in the presence of CSP perceived by socially responsible investors, individual demand functions for both assets will also be the same as it was for the previous generation (Equations (13) to (17)). The impact of imitation will appear in price functions which are represented by the weighted averages of prices attributed by both types of investors. Following the reaction of socially responsible investors to CSP, the respective prices of assets *i* and *j* are:

$$\tilde{p}_{i,2} = \frac{\hat{x}_i - 2\gamma\cdot\hat{\sigma}_i^2}{(1+r_i)} + \frac{((\eta^S + \Delta\eta^s)/2)\left(\theta\cdot\hat{x}_i - 2\gamma(\theta^2+2\theta)\hat{\sigma}_i^2\right)}{(1+r_i)} \tag{26}$$

$$\tilde{p}_{j,2} = \frac{\hat{x}_j - 2\gamma\cdot\hat{\sigma}_j^2}{(1+r_j)} - \frac{((\eta^S + \Delta\eta^s)/2)\left(\theta\cdot\hat{x}_j - 2\gamma(\theta^2+2\theta)\hat{\sigma}_j^2\right)}{(1+r_j)} \tag{27}$$

In Equations (26) and (27), the first terms represent, respectively, the prices of assets *i* and *j* in the absence of any perceived CSP (Equations (8) and (9)) and the second terms reflect the impacts of CSP and imitation on respective prices. Subtracting (18) from Equation (26) and (19) from Equation (27), we obtain the impact of imitation on the two assets:

$$\tilde{p}_{i,2} - \tilde{p}_i = \frac{(\Delta\eta^s/2)\left(\theta\cdot\hat{x}_i - 2\gamma(\theta^2+2\theta)\hat{\sigma}_i^2\right)}{(1+r_i)} \tag{28}$$

$$\tilde{p}_{j,2} - \tilde{p}_j = -\frac{(\Delta\eta^s / 2)\left(\theta \cdot \hat{x}_j - 2\gamma(\theta^2 + 2\theta)\hat{\sigma}_j^2\right)}{(1+r_j)} \tag{29}$$

Equations (28) and (29) reflect the impact of imitation on respective prices. Note that the impact depends on the change in the proportion of socially responsible investors in the market. If condition (14) holds, imitation results in a positive change of price for *i* (negative for *j*). In other words, the reaction of the socially responsible investors of the second generation to the CSP results in a higher price for asset *i* (lower price for asset *j*). *Ceteris paribus*, this reaction results in a lower expected return for asset *i* (higher expected return for asset *j*). However, the impact of this reaction will be amplified compared to that of the first generation.

From the second generation of conventional investor's viewpoint, with his behavior being the same as that of the first generation, the difference in expected returns is perceived as a signal, leading them to favor asset *j* over asset *i*. This simultaneous investment decision by the conventional investors, once again, would result in new equilibrium prices for both assets:

$$p_i^{**} = \frac{\hat{x}_i - 2\gamma \cdot \hat{\sigma}_i^2}{(1+r_i)} + \frac{((\eta^s - \eta^c)/2) \cdot \left(\theta \cdot \hat{x}_i - 2\gamma \cdot (\theta^2 + 2\theta) \cdot \hat{\sigma}_i^2\right)}{(1+r_i)} + (\Delta\eta^s) \cdot \frac{\left(\theta \cdot \hat{x}_i - 2\gamma \cdot (\theta^2 + 2\theta) \cdot \hat{\sigma}_i^2\right)}{1+r_i} \tag{30}$$

$$p_j^{**} = \frac{\hat{x}_j - 2\gamma \cdot \hat{\sigma}_j^2}{(1+r_j)} + \frac{((\eta^c - \eta^s)/2) \cdot \left(\theta \cdot \hat{x}_j - 2\gamma \cdot (\theta^2 + 2\theta) \cdot \hat{\sigma}_j^2\right)}{(1+r_j)} - (\Delta\eta^s) \cdot \frac{\left(\theta \cdot \hat{x}_j - 2\gamma \cdot (\theta^2 + 2\theta) \cdot \hat{\sigma}_j^2\right)}{(1+r_j)} \tag{31}$$

Equations (30) and (31) show the final equilibrium prices following simultaneous reactions of both types of investor in the second generation. We showed in Equations (23) and (24) that simultaneous reactions of socially responsible and conventional investors would result in a lower equilibrium price for *i* (higher for *j*) and consequently a higher expected return for *i* (lower for *j*) in the first generation. In Equations (30) and (31), the third terms show the impact of imitation in the second generation. The relatively higher proportion of socially responsible investors in the market has a positive impact on the equilibrium price of *i* (negative for *j*) and consequently, a negative impact on the expected return for *i* (positive for *j*) compared to the final equilibrium of the first generation. However, the magnitude of this impact depends strictly on the magnitude of change in the proportion of socially responsible investors $(\Delta\eta^s)$ between the two generations. If the proportion of socially responsible investors remains inferior in the second generation relative to the proportion of conventional investors, the equilibrium price would remain inferior for *i* (superior for *j*) and consequently, the expected return of *i* remains superior to *j*. If the change of proportions creates an equal number of socially responsible and conventional investors, this would result in equal equilibrium prices and the same expected returns for both assets. Finally, if the change of proportions in the second generation creates a superior number of socially responsible investors relative to the number of conventional investors, the equilibrium price would be superior for asset *i* (inferior for *j*). This could result in a lower expected return for asset *i* (higher for *j*). Bouslah, Kryzanowski, and M'Zali (2013) suggest that socially responsible investments have risen to 12.2% of all assets under management in the US in recent years. Therefore, it is plausible to assert that socially responsible investors still represent an inferior proportion of the total investors on the market. Consequently, imitation will result in a lower equilibrium price (higher expected return) for the asset *i*, and a higher equilibrium price (lower expected return) for the asset *j*. However, given the narrower gap between the respective proportions of socially responsible and conventional investors, the gap between the equilibrium prices and consequently the expected returns of the two assets will be lower in the second generation.

5. Conclusions

We have shown that corporate social performance can affect the risk/expected return combination of stocks and consequently, the investor's satisfaction. Even though our model bears some simplifications, it suggests answers to several questions about the relationship between social and financial performances. Our results show that socially responsible investors can increase their performance by considering social criteria in their decision-making process. Our results show that under certain conditions such as the minimum of expected return/risk ratio and the presence of conventional investors in the market, socially responsible investors can expect higher returns. Overall, our findings suggest that there are possible financial gains for investors in considering social criteria and thus provides valuable information for their investment decisions.

This paper has also argued that a number of questions concerning the risk premium of assets could be explained by corporate social performance. These questions include the incapacity of the market to explain the risk premium or the possible existence of additional risk factors that can be compensated by the market in form of additional financial gain. Our model suggests that corporate social performance could be a secondary factor to be used in order to measure the risk premium of individual assets. Consequently, our results are consistent with Detemple and Giannikos (1996) and Grossman and Laroque (1990) who suggest that when durability is accompanied by multiple characteristics, the structural form of the risk premium changes.

We considered the role of imitation in the model and concluded that through a process of learning, the proportion of socially responsible investors might increase and consequently, the gaps between the equilibrium prices and expected returns of socially responsible assets and those of conventional assets may decrease. However, in our mean-variance model, we did not take into consideration the dynamic factor in the imitation process. Future research might find useful and necessary to consider explicitly a dynamic model to analyze the changes between generations and the imitation process from one generation to another. Moreover, most socially responsible investors on the market are frequently institutional investors who can affect assets' prices by their individual demands and relatively large amount of purchases. It would also be useful to consider how price makers' behavior would affect socially responsible assets' prices and expected returns.

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