The Good, the Bad, and the Ugly: A Theory of Profitable and Effective Socially Responsible Investments[1]

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Abstract

We examine the functioning of financial markets when firms can invest in activities that produce externalities. We study a model in which some investors are socially responsible ("the Good"): they take externalities into account when they value their portfolio, because they believe that these externalities will materialize into better long-run performance or because they are altruistic. In presence of purely financial investors ("the Bad"), there are two mechanisms by which socially responsible investors can influence firm's decisions. They can vote with their feet, thereby raising the cost of capital of non-responsible firms. They can also try to engage in activism. This strategy is effective unless socially responsible investors do not hold enough shares to impose their view to the management. In this case, a large investor ("The Ugly") can generate positive abnormal returns by investing in non-responsible companies and turning them into responsible ones. We show that a long-term horizon and a pro-social orientation raise the purely financial profit of the large investor. In some cases, a large anti-social oriented investor could use the same type of strategy to profitably change a company from responsible to non-responsible.

Keywords: Asset pricing, corporate social responsibility, socially responsible investment, private equity, corporate engagement, shareholder activism.

JEL Classification: G34, H23

1 Introduction

Socially responsible investors constitute an important part of today's financial markets. According to the Social Investment Forum, about 11% of assets under management in the US is managed following this investment style. In Europe, this percentage has been growing at a fast pace to reach 17% of assets under management according to Eurosif. Socially responsible investors base their decisions not only on financial analysis but also on environmental, social, and governance criteria. Their objective is to offer an appropriate long-run financial performance and to induce corporations to internalize the externalities they exert on Society.

In this paper, we examine the conditions under which socially responsible (hereafter, SR) investors ("The Good") could induce corporations to behave more responsibly.[1] Responsible behaviors are generating positive externalities (or less negative externalities than their peers). These externalities are valued by SR investors in proportion of their investment in the responsible firms. By altering their portfolio allocation towards responsible assets, these investors can decrease the equilibrium cost of capital of responsible firms, thereby inducing firms to behave more responsibly. This can be a substitute to the standard public interventions aimed at forcing agents to internalize their externalities.[2] However, this strategy can be counterbalanced by purely financial investors ("The Bad"), who will rebalance their portfolio in favor of "vice assets" because of their relative increase in expected return. To better understand the relationship between corporate behavior and investors' strategies, we explicitly consider that investors vote on (or may influence) corporate decisions. This enables us to study how shareholders' engagement affects firm value.

We first derive the conditions under which socially responsible companies have a higher market capitalization than non-responsible ones, considering

[1]In his classic spaghetti western movie, Sergio Leone tells the epic story of three bounty hunters who race to find a fortune in gold. After a memorable three-way fight, "The Bad" bites the dust and "The Good" and the "The Ugly" share the gold. This paper shows how, confronted with purely financial investors, socially responsible investors and private equity funds (or other raiders and activist hedge funds) can implement strategies that are mutually beneficial for their financial performance and for their social responsibility effectiveness.

[2]Pigovian taxes may be difficult to implement, in particular in the presence of transfrontier externalities, as in the case of climate change.

that the level of responsibility of the firm is given. We show that responsible firms are more valued than non-responsible ones if socially responsible strategies are not too costly for firms, and if the externality and the proportion of SR investors are high enough. In some circumstances, a corporate social responsibility (CSR) premium associated with the fact that a company increases its level of CSR arises. Market capitalization may thus increase or decrease after CSR adoption. This sheds light on the empirical literature that finds mixed results regarding the influence of CSR on firm value (see, for example, Wagner (2001), Orlitzky, Schmidt, and Rynes (2003), Bauer, Koedijk, and R. Otten (2005), Geczy, Stambaugh, and Levin (2005), and Margolis, Elfenbein, and Walsh (2007)). We also find that the short-term risk-adjusted return of socially responsible assets however appears to be always lower than the one of non-responsible assets. This is in line with the empirical results of Hong and Kacperczyk (2009) who show that vice assets enjoy a higher risk-adjusted return than other assets. Finally, we find that, in the long-run, socially responsible assets might enjoy a superior performance than non-responsible ones when the externalities translate into actual financial cash-flows (see, for example, Guenster, Bauer, Derwall, and Koedijk (2010), and Edmans (2010) for empirical evidence consistent with this result).

We then proceed to study the adoption of CSR in firms. For simplicity, we consider that shareholders vote on corporate strategic decisions. Our analysis though can speak to other forms of activism such as engagement with the management. We find that, when the number of SR investors and the externality are high enough, and when SR investors' risk aversion and undiversifiable risk are low enough, socially responsible strategies are naturally adopted by firms.[3] This is because SR investors hold a majority of firms' capital which enables them to control shareholders' meetings (or to influence management). However, when SR investors do not hold a majority of firms' shares, socially responsible behaviors are not adopted. This can be avoided thanks to the intervention of a large socially responsible raider ("The Ugly"). This raider can buy and hold non-responsible firms' shares in an attempt to build a majority in favor of the socially responsible strategy. [4] If not too risk

[3] The size of the externality can also be interpreted as the strength of the consensus around the CSR issues under consideration, in line with discussions in Landier and Nair (2008).

[4] For an analysis of hedge fund activism (unrelated to social responsibility), see the paper by Brav, Jiang, Partnoy, and Thomas (2008).

averse, the raider will succeed in acquiring a controlling block. The socially responsible strategy is thus adopted at equilibrium. This can be associated with a positive abnormal return for the socially responsible raider: the raider can sell back part of the socially responsible firm and pocket in the CSR premium. Such a strategy could not be successfully implemented by a purely financial raider. Indeed, this raider would like to announce that he will vote in favor of the socially responsible strategy in order to pocket in the CSR premium. But, since this announce is not credible if he is a purely financial player, socially responsible investors are not ready to pay a premium in order to buy firms' share and the raider does not display abnormal returns.

Overall, our analysis suggests that there are two ways socially responsible investors can display a positive abnormal (risk-adjusted) performance. On the one hand, if externalities materialize in the long-run into financial results, socially responsible investors that are tilted towards responsible assets enjoy higher returns than classical investors. On the other hand, a socially responsible investor can also generate positive abnormal returns in the short-run. This requires adopting a raider type of strategy: i) investing in non-responsible firms, ii) acquiring enough shares to be pivotal during shareholders' meetings or to be powerful enough when negotiating with management, iii) being sufficiently inclined towards social responsibility so that commitments to vote for costly increases in CSR are credible. These three ingredients are consistent with anecdotal evidence from the field. In September 2007, KKR and TPG, two private equity firms, along with Goldman Sachs Capital Partners, acquired TXU, a large Texas utility company, in the largest buyout ever. The $45 billion deal was made possible thanks to the promise not to launch new coal plants that would have dramatically increased the firm's CO2 emissions.[5] This promise was made credible thanks to the endorsement of two environment protection institutes, EDF and NRDC, that were closely associated with the deal. The endorsement by the two institutes can be interpreted as a way for KKR and TPG to credibly commit to favor CSR.

The active investment strategy we describe requires investing in non-responsible companies before making them more responsible. This includes a reputational risk that some investors, such as large pension funds and

[5]For detailed information, see the online case study provided by the Yale school of Management at http://cases.som.yale.edu/txu.

mutual funds, are not always willing to bear. This leaves more room for flexible investment funds such as private equity and hedge funds, or individual raiders to implement such strategies. Finally, purely financially oriented active investors could also implement the same type of investment strategies. They could successfully acquire firms and make them less socially responsible before reselling part of their holding on the market at a profit. Whether the activity of active investors will lead to more or less corporate social responsibility is thus an empirical question.

The literature on the pricing implications of socially responsible investors starts with the seminal contribution of Heinkel, Kraus, and Zechner (2001). They study an asset pricing model in which some investors exclude non-responsible assets from their investment universe. These non-responsible assets then enjoy a higher risk premium because their risk is borne by fewer investors. This analysis has been extended in several directions. Barnea, Heinkel, and Kraus (2005) study equilibrium investments in various industries according to their level of social responsibility. They show that non-responsible industries receive less capital thereby inducing a lower level of investments in the economy. Baron (2007) models socially responsible activities as donations. He then studies an economy in which not only firms but also individuals can make such donations. In this context, he shows that the cost of CSR is borne by social entrepreneurs, who suffer from the lower valuation of their companies when they take them public, but not by subsequent shareholders who earn the adequate risk-adjusted return. We complement this literature i) by showing how investors can affect corporate strategy via voting (or via engagement), and ii) by analyzing how SR investors can design profitable and effective strategies.

To explicitly analyze shareholders influence on corporate decisions, we assume that corporate strategy is chosen in shareholder meetings via a simple majority-voting rule. This assumption is meant to reflect the fact that a significant portion of outstanding shares is required in order to affect corporate decisions. The fact that there is an actual vote in our model is not crucial. It can also be interpreted by saying that shareholders can affect decisions via engagement with the firm and that this engagement is more effective when shareholders hold larger stakes in the firm. Voting-with-your-feet strategies as opposed to monitoring have been theoretically studied by Maug (1998) and Edmans and Manso (2011), and empirically documented by Parrino, Sias, and Starks (2002). We complement these analysis by considering a set-

ting in which the private benefit of control derives from differences of opinion concerning the prospects of the various corporate strategies.

The rest of the paper is organized as follows. Section 2 presents our baseline model and equilibrium concept with competitive investors. Section 3 studies the impact of a large raider. Finally, Section 4 concludes.

2 Asset pricing and corporate behaviors with atomistic investors

Consider an economy with three dates and one firm. Firm's assets are assumed to already be in place. They initially belong to the owner of the firm, who sell them to atomistic investors at date 1. The risk-free rate is normalized to 0. At date 3, the firm yields a random financial return r per share. The return r is normally distributed with mean Er, and variance σ^2. There is a continuum of investors indexed by $i \in [0,1]$ with a mass of one such that $\int_0^1 di = 1$. Investors have a utility function $U(X) = -e^{-AX}$, in which $A > 0$ represents the constant absolute risk aversion parameter. Investors initially hold no cash and no shares. We denote by h_i the number of shares held by investor i after trading at date 1. We assume that short-selling positions are allowed. The number of firm's shares is normalized to 1, so that the market-clearing condition is $\int_0^1 h_i di = 1$. Investor i's final wealth is written $W_i = h_i (r - P)$, where P is the unit price of the firm's shares ex ante.

At date 2, the firm is confronted with a choice between two alternative strategies. Strategy $s = 0$ has no social externality and its expected return is $Er(s = 0) = \mu > 0$. Strategy $s = 1$ generates a social externality which is valued at $e > 0$ units of numeraire per share. The firm's expected (financial) return if the responsible strategy $s = 1$ is adopted is $Er(s = 1) = \mu - c$, in which $c > 0$ represents firm's financial cost of implementing the pro-social activity. Another interpretation is that c is the cost to incur in order to reduce a negative externality by e. We assume that $e > c$ so that the responsible strategy is desirable from a social point of view.

Investors differ upon their socially responsible orientation. When they evaluate the performance of their investment, socially responsible (SR) investors internalize both the financial and the extra-financial returns. This means that they evaluate the return per share as $\mu - c - P + e$ for the re-

sponsible firm, and $\mu - P$ for the firm implementing strategy $s = 0$. One interpretation is that SR investors believe that the externality will materialize in the long-run, and that it will affect the profitability of the firm. Another interpretation is that SR investors are altruistic and internalize the social impact of their investments. Other investors referred to as traditional investors do not value the externality, either because they do not believe they will materialize (we are then in a differences of opinion model, see Harris and Raviv (1993) for example) or because they do not have altruistic preferences. We use the dummy variable x_i to express pro-social values, where x_i takes value 1 if investor i is socially responsible, and 0 otherwise.[6] SR investors constitute a proportion π of the investors, which means that $\int x_i di = \pi$.

2.1 Demand and price with and without corporate responsibility

The demand for firm's shares and the equilibrium price are a function of investors' expectations about firm's behavior. Let's first consider the simple case where investors expect that the firm will not adopt a pro-social behavior: $s = 0$. Thus, all investors solve the same one-riskfree-one-risky portfolio choice problem in which we know that the Arrow-Pratt approximation for the certainty equivalent final wealth is exact. Thus, they all select h that maximizes the certainty equivalent final wealth, which equals $h_i(\mu - P) - 0.5h_i^2\sigma^2 A$. This yields $h_i^*(s = 0) = (\mu - P)/A\sigma^2$. The market-clearing condition implies that $h_i^* = 1$ for all i, which implies that

$$P(s = 0) = \mu - A\sigma^2. \tag{1}$$

Since the firm generates no externality, the pricing equation reflects only the risk-return tradeoff, and the holding equation indicates that all agents hold the same portfolio. We suppose that $\mu - A\sigma^2$ is positive, so that the value of the firm is positive even without investing responsibly.

Suppose alternatively that investors believe that the firm will adopt the responsible behavior. Investor i's optimization program is:

$$\max_{h_i} \mathbb{E}U((r - c - P + x_i e)h_i) = U((\mu - c - P + x_i e)h_i - 0.5Ah_i^2\sigma^2).$$

[6] We obtain similar results by allowing x_i to belong to interval $[0, 1]$, in which case x_i can be interpreted as an index of altruism.

It yields the following demand for firm's shares:

$$h_i = \frac{\mu - c + x_i e - P}{A\sigma^2}. \quad (2)$$

Market-clearing imposes $\int_0^1 h_i di = 1$. The firm's share price is thus equal to:

$$P\,(s=1) = \mu - A\sigma^2 + \pi e - c. \quad (3)$$

As before, this pricing equation reflects the basic tradeoff between return and risk: the share price equals the expected return corrected for risk (discounted at the risk-free rate of zero). One difference with a classic asset pricing formula is the fact that, due to responsible investors, the share price incorporates part of the firm's externality. Equation (3) means that the expected financial return of the firm, $Er(s=1) - P$, is equal to $A\sigma^2 - \pi e$.

At equilibrium, after-trading holdings are given by:

$$h_i\,(s=1) = 1 + \frac{(x_i - \pi)e}{A\sigma^2}, \text{ for all } i. \quad (4)$$

The responsible investors invest more in the responsible firm than non-responsible investors. The absence of full polarization of portfolio structures between responsible and traditional investors comes from risk aversion. The additional investment in the responsible firm's shares increases with the level of the positive externality and decreases with their level of risk aversion and the level of risk. This result is in line with the empirical evidence offered by Edmans (2010) showing that socially responsible funds increase their holdings of firms that appear in the list of Fortune's 'Best Companies to Work For". Equation (4) also tells us that the pro-social behavior of altruistic investors is partially offset by the purely financial investors. Indeed, agents with $x_i = 0$ have a demand for the responsible firm that is smaller than for an irresponsible firm at equilibrium. This is due to the price effect of the reduced demand by altruistic investors. The opportunistic behavior of non-altruistic investors dampens the impact SR investors on the cost of capital of responsible firms.

The above pricing and holdings equations suggest that responsible investors can display a higher expected rate of return than no-responsible ones. Indeed, responsible investors invest more in the responsible firm. If we assume that $A\sigma^2 - \pi e$ is positive, responsible firms yield a rate of financial

return that is larger than the riskfree rate. Thus, responsible investors select a riskier portfolio yielding a larger expected financial return. But firm's equity return does not compensate enough for the risk. The risk adjusted performance of responsible investors will appear lower. However, responsible investors receive an additional compensation from the social return (the positive externality) generated by the firm.

Our pricing results (1) and (3) show that the firm's share price is higher when the socially responsible strategy is adopted if and only if $\pi e > c$, that is, if the proportion of responsible investors and the size of the externality are sufficiently high, and if the cost of implementing the pro-social strategy is low enough. Otherwise, the market value of the responsible firm is smaller. This result can explain why extant empirical studies disagree on the impact of CSR on firm value (see, for example, Wagner (2001), Orlitzky, Schmidt, and Rynes (2003), Bauer, Koedijk, and R. Otten (2005)).

2.2 Voting-with-our-feet equilibrium

In this section, we assume that before selling the firm, the initial owner is able to fix the firm's responsibility status s irreversibly. Once s is selected, the owner sells the firm to atomistic investors who cannot change s. This implies that the initial owner of the firm selects the degree of corporate responsibility to maximize its market value. The owner knows that, if the pro-social investment is not performed, responsible investors will reduce their demand for its shares. This has an adverse effect on its market value and on its cost of capital, which has to be weighted with the cost c to invest more responsibly.

Definition 1 *A voting-with-our-feet equilibrium is defined by a vector* (P^*, s^*, h_i^*) *such that*

1. *Optimal portfolio allocation:* $h_i^* \in \arg\max \mathbb{E}U\left((r - P^* + s^*(x_i e - c))h_i\right)$*;*
2. *Market clearing condition:* $\int_0^1 h_i^* di = 1$*;*
3. *The firm invests responsibly if it increases its market value:* $s^* = 1$ *iff* $P(s = 1) > P(s = 0)$.

We have seen above that the market value of the firm is $\mu - A\sigma^2 + \pi e - c$ and $\mu - A\sigma^2$ respectively if it invests responsibly or not. Thus, we obtain that $s^* = 1$ if and only if πe is larger than c, or $\pi \geq c/e$. This is the case if the proportion of responsible investors is large, or if the social benefit to cost ratio is large.

Proposition 1 *There are two possible voting-with-our-feet equilibria:*

- *The SR equilibrium in which the firm behaves responsibly,* $P^* = \mu - A\sigma^2 + \pi e - c$*, and responsible investors hold more of the firm's equity in their portfolio than the traditional investors.*
- *The non-SR equilibrium in which the firm does not behave responsibly,* $P^* = \mu - A\sigma^2$*, and all investors hold the same portfolio.*

When π *is larger (resp. smaller) than* c/e*, the SR (resp. non-SR) equilibrium exists.*

The underlying incentive mechanism is simple: the credible threat of responsible investors to reduce their investment in the firm if it does not behave responsibly provides an incentive for corporate social responsibility. Indeed, it reduces the market value of irresponsible firms. In other words, it raises their cost of capital. This effect has been studied theoretically by Heinkel et al. (2001) and empirically by Hong and Kacperczyk (2009). The incentive scheme is made stronger when the proportion of pro-social investors increases on the market. Notice however that the incentive is too weak in the sense that it may be possible that a socially desirable investment ($e > c$) is not implemented because doing so would reduce the market value of the firm ($\pi e < c$).

We can try to give numbers here. In the Stern Review (2006), the damages generated by the emission of greenhouse gases in the business-as-usual scenario are estimated to be equivalent to an immediate and permanent loss of the world GDP by an amount comprised between 5% and 20%. To fix ideas, let us consider the middle $e = 12.5\%$ of this interval. At the same time, Stern estimates that most of these consequences could be eliminated by sacrificing immediately and permanently 1% of the world GDP, invested in alternative/new technologies to reduce emissions. Thus, for the application of climate change, we can estimate the ratio c/e around 8%. This suggests that social efficiency could be obtained in the voting-with-our-feet equilibrium if the proportion of altruistic investors is larger than 8%.

2.3 Equilibria with shareholders' vote

Investors can vote with their feet but they can also intervene directly through shareholder meetings. To make this possible, let us modify the timing of the game. The initial owner of the firm cannot irreversibly select s ex ante. At date 1, investors purchase the firm's shares at price P. At date 2, the general assembly of the corporation votes on a proposal to invest more or less responsibly on the basis of one-share-one-vote. At date 3, returns are realized. We denote by v_i the vote of agent i for each share he holds in the firm. $v_i = 1$ corresponds to a vote in favor of $s = 1$ and $v_i = 0$ to a vote in favor of $s = 0$. The aggregate vote in favor of strategy $s = 1$ is defined as $v = \int_0^1 v_i h_i di$. The majority rule implies that, if $v \geq \frac{1}{2}$, the pro-social strategy $s = 1$ is adopted. Otherwise, the firm adopts the purely financial strategy.

Since investors are atomistic, they are never pivotal in the vote on corporate strategy. As a result, any voting outcome can be sustained at equilibrium. However, investors have rational expectations and anticipate what the outcome of the vote will be depending on the proportion of the various types of investors in the firm's capital. This enables them to derive their demand for assets. We assume that, at equilibrium, investors coordinate on the same equilibrium.

To restrict the set of equilibria, we define an intuitive voting strategy as a voting rule in which investors vote according to their social orientations: responsible investors vote for the pro-social strategy $s = 1$ while traditional investors vote for the purely financial strategy $s = 0$.

Definition 2 *A shareholder-vote equilibrium is defined by a vector* (P^*, s^*, h_i^*, v_i^*) *such that*

1. *Optimal portfolio allocation: for all* i, $h_i^* \in \arg\max \mathbb{E}U\left((r - P^* + s^*(x_i e - c))h_i\right)$;
2. *Market clearing condition:* $\int_0^1 h_i^* di = 1$;
3. *Corporate strategy of the firm:* $s^* = 1$ *if* $v^* = \int_0^1 v_i^* h_i^* di \geq \frac{1}{2}$, *and* $s^* = 0$ *otherwise, with* $v_i^* = x_i$.

Condition 1 states that the two types of investors are choosing optimal portfolios given the corporate strategy that is expected to be selected at equilibrium. Condition 2 is the market clearing condition. Condition 3 indicates that we focus on equilibria with intuitive voting strategies.

Let us consider first the equilibrium in which it is expected that the proposal to invest more responsibly will be defeated at the general assembly. As we already know, this implies that all investors, socially responsible or not, hold one share $h_i^* = 1$ of the firm, which implies that $P^* = \mu - A\sigma^2$. We now verify under what condition this equilibrium exists. To do so, we need to verify that the condition $v^* < \frac{1}{2}$ holds. Because all investors hold the same number of shares, the proportion of votes in favor of the pro-social strategy is the same as the proportion of socially responsible agents in the economy. Thus, $s^* = 0$ is an equilibrium if and only if π is smaller than $1/2$. The equilibrium in which the firm chooses the purely financial strategy exists if and only if a majority of investors is not responsible.

Let us now consider the alternative equilibrium in which it is expected that the proposal to invest more responsibly will get a majority vote at the general assembly. We know that this implies that

$$h_i^* = 1 + \frac{(x_i - \pi)\, e}{A\sigma^2}, \tag{5}$$

and

$$P^* = \mu - A\sigma^2 + \pi e - c.$$

The proportion of votes in favour of social responsibility is thus equal to

$$v^* = \int x_i h_i^* di = \pi \left(1 + \frac{(1 - \pi)\, e}{A\sigma^2} \right). \tag{6}$$

Thus, a shareholder-vote equilibrium inducing the firm to behave responsibly exists iff v^* defined by (6) is larger than $1/2$. From equation (6), we see that the proportion v^* of shares held by responsible investors is larger than their proportion π on the market, since they hold proportionally more of the responsible asset in their portfolio. Thus it may be possible that the pro-social proposal succeeds in the general assembly in spite of the fact that there is a minority of responsible agents on the market. This is more likely to be the case if $e/A\sigma^2$ is large.

Proposition 2 *The two possible shareholder-vote equilibria are the SR and non-SR equilibrium described in Proposition (1). When v^*, which is defined by (6), is smaller than $1/2$, only the non-SR equilibrium exists. When π is larger than $1/2$, only the SR-equilibrium exists . Finally, when $\pi \leq 1/2 \leq v^*$, the two equilibria coexists.*

When $\pi \in \left[\frac{1}{2}\left(1+\frac{(1-\pi)e}{A\sigma^2}\right)^{-1}, \frac{1}{2}\right]$, the two intuitive equilibria characterized above exist; the prevalence of one equilibrium instead of another depends on whether investors coordinate their anticipations on the responsible strategy being chosen or not.

3 Engagement by a large investor

This section studies what could be the role and financial performance of a large investor, referred to as a raider, who stands ready to hold large stakes in firms.

We introduce a date 0 in our model. We assume that the initial owner wants to sell the assets for exogenous liquidity reasons at date 0 to the raider or at date 1 to the atomistic investors. The formal objective of the initial owner of the firm is to maximize the proceeds from sales by choosing the date at which the sale occurs. If the sale occurs at date 0, the initial owner gets P_0 from the raider. If the initial owner sells at date 1 directly to investors, the owner gets P_1 (we do not need to introduce any expectation operator since, at equilibrium, P_1 is perfectly anticipated), with P_1 being determined as in the previous section. As before, P_1 depends on whether responsible investors have or not a majority of votes. Dates 1, 2, and 3 proceed as in section 2.3.

At date 0, the risk-neutral raider stands ready to acquire the firm's financial assets. In order to do so, he makes a take-it-or-leave-it offer for the 100% of the shares to the initial owner.[7] His level of social responsibility is denoted by $\theta \in [0, 1]$, where θ represents the proportion of the externality that he internalizes. We denote by $1-\alpha$ the proportion of the firm's shares that the raider resells at date 1 at a price denoted P_1. The remaining α shares are held up to date 3. The α shares entitle the raider to vote on firm's corporate strategy at date 2. His vote is denoted V, with $V = 1$ if the raider votes for the responsible strategy and $V = 0$ otherwise. $\mathbb{E}_t U_R$ represents raider's expected utility conditional on information available at date t. Raider's expected utility at date 2 is $\mathbb{E}_2 U_R = (1-\alpha) P_1 + \alpha (\mu + s(\theta e - c)) - P_0$: After

[7] The initial owner not being atomistic alleviates the free-rider problem, analyzed by Grossman and Hart (1980), that a raider would face when trying to buy shares from atomistic investors. In order to solve this free-rider problem, we could have instead considered that the raider's offer is conditional on the fact that all shares are tendered.

purchasing the firm at price P_0, he sells a fraction $1-\alpha$ at price P_1 and retains a fraction α, whose expected return is μ if the firm does not behave responsibly. It it does, the financial return is reduced by c. But the raider also takes into account of a fraction θ of the extra-financial return e of its investment in that case.

Definition 3 *A strategic-raider equilibrium is defined by a vector* $(P_0^*, P_1^*, s^*, \alpha^*, h_i^*, v_i^*, V^*)$ *such that*

1. *Atomistic investors' optimal portfolio allocation:* *for all i,* $h_i^* \in \arg\max \mathbb{E}U\left((r - P_1^* + s^*(x_i e - c))h_i\right)$*;*
2. *Market clearing condition:* $\int_0^1 h_i^* di = 1 - \alpha^*$*;*
3. *Corporate strategy of the firm:* $s^* = 1$ *if* $v^* = \alpha^* V^* + \int_0^1 v_i^* h_i^* di \geq \frac{1}{2}$*, and* $s^* = 0$ *otherwise, with* $v_i^* = x_i$*.*
4. *Take-it-or-leave-it offer from the raider to the initial owner:* $P_0^* = P^*$*, where P^* is the shareholder-vote equilibrium price absent of the raider, as characterized in Proposition 2;*
5. *Large investor's optimal portfolio allocation:* $\alpha^* \in \arg\max \mathbb{E}_1 U_R(s^*)$*;*
6. *Large investor's voting strategy:* $V^* = 1$ *if* $\mathbb{E}_2 U_R(s^* = 1) \geq \mathbb{E}_2 U_R(s^* = 0)$*, and* $V^* = 0$ *otherwise.*

The first three conditions are interpreted as in the previous section. A difference is that the number of shares available for investors is $1-\alpha$ instead of 1. This changes the risk premium and the level of investors' holdings in the firm. Condition 4 indicates that the raider proposes the initial owner a price that equals the amount the owner would get if he were to sell shares directly to investors at date 1 (P^* is the same than in the previous section).[8] Condition 5 indicates that the raider chooses at date 1 how many shares he wants to hold up to date 3 such that he maximizes his expected utility

[8] The take-it or leave-it offer gives all the bargaining power to the raider. Other less extreme bargaining mechanisms would leave some surplus to the initial owner. This issue is not important from a theoretical viewpoint since all the results in this section hold as long as the raider captures some of the surplus.

(anticipating the strategy that is adopted at date 2). Finally, condition 6 indicates that, contrary to the atomistic non-pivotal voters, the raider votes at date 2 for the strategy that maximizes his expected utility. We solve for the intuitive equilibrium by backward induction.

At date 2, the raider holds α^* shares, responsible investors hold $\int x_i h_i^* di$, and traditional investors hold the remaining shares. Raider's expected utility is $\mathbb{E}_2 U_R = (1-\alpha^*)\, P_1^* + \alpha^* \left(\mu + s^*(\theta e - c)\right) - P_0^*$. If the raider is pivotal, he votes in favor of the responsible strategy if and only if:

$$(1-\alpha^*)\, P_1^* + \alpha^* \left(\mu + \theta e - c\right) - P_0^* \geq (1-\alpha^*)\, P_1^* + \alpha^* \mu - P_0^*,$$

or equivalently, if $\theta e \geq c$, or $\theta \geq c/e$. This inequality suggests that, at the voting stage, the raider votes in favor of the responsible strategy if he is sufficiently responsible and if the social cost to benefit ratio of the responsible investment is sufficiently low. Indeed, since it is financially damageable to implement the socially responsible strategy, the raider votes in favor of this strategy only if he experiences enough additional utility or perceived benefits from the increase in social responsibility.

3.1 Large investor's engagement towards more responsibility

We focus first on the case in which $\pi\left(1 + (1-\pi)\, e/A\sigma^2\right) < 0.5$. From Proposition 2, absent raider's intervention, the responsible strategy is not adopted at the intuitive shareholder-vote equilibrium. In this case, the raider proposes a price:

$$P_0^* = \mu - A\sigma^2. \tag{7}$$

The initial owner cannot do better than accepting the offer, since $\mu - A\sigma^2$ is the competitive price when the firm does not invest responsibly, in the absence of the large investor.

As a benchmark, we first consider an equilibrium in which the raider purchases the firm but votes against the responsible investment. As shown at the end of the previous section, such a strategy is credible if and only if $\theta < c/e$. Because of the risk aversion of atomistic investors, it is an equilibrium that they do not purchase any share from the raider at date 1, which is sustained by price $P_1^* = \mu$. So, the raider just takes advantage here

of its risk-neutrality to purchase at price $\mu - A\sigma^2$ something that it values at μ. This equilibrium is described in the following proposition.

Proposition 3 *Suppose that* $\pi\left(1+(1-\pi)\,e/A\sigma^2\right) < 0.5$ *and* $\theta < c/e$. *Then, the strategic-raider equilibrium is such that*

- *(date 0) The initial owner sells the firm to the large investor at the low price* $P_0^* = \mu - A\sigma^2$;
- *(date 1) The large investor does not sell shares at date 1, and the price of shares is* $P_1^* = \mu$. *Atomistic investors do not hold shares of the firm;*
- *(date 2) The large investor does not adopt the socially responsible strategy;*
- *The equilibrium expected profit for the large investor is*

$$\mathbb{E}_1 U_R = A\sigma^2 \geq 0. \tag{8}$$

We hereafter examine the more interesting case in which the large investor holds enough shares of the firm and has a large enough social orientation to reverse the majority in favour of investing responsibly. Suppose that all investors anticipate this. As observed above, this equilibrium requires that θe be larger than c, otherwise the large investor will never vote in favour of more responsibility.

Anticipating the majority vote in favour of the responsible investment, the market equilibrium price and holdings at date 1 are given by $h_i^* = 1 - \alpha + (x_i - \pi)\,e/A\sigma^2$, for all i, and

$$P_1^* = \mu - (1-\alpha)\,A\sigma^2 + \pi e - c. \tag{9}$$

At date 1, because the raider expects to be pivotal and change the firm's strategy towards more responsibility, his expected utility is given by $\mathbb{E}_1 U_R = (1-\alpha)\,P_1^* + \alpha\,(\mu + \theta e - c) - P_0^*$. In this case, the optimal amount of shares that he keeps after trading at date 1 is the one that maximizes $\mathbb{E}_1 U_R$. Replacing P_1^* by its expression above and solving yields

$$1 - \alpha^* = \frac{(\pi - \theta)e}{2A\sigma^2}. \tag{10}$$

When $\theta = \pi$, we obtain that $\alpha^* = 1$. Indeed, this is a situation in which the expected total return of the firm is evaluated in the same way by the two types of SR investors. Because atomistic ones are risk-averse, the only possible equilibrium price is $P_1^* = \mu + \theta e - c$, and atomistic investors have a zero net demand for the firm's shares. The large investor sells some of its shares at date 1 only if its social orientation θ is smaller than the proportion π of responsible agents in the population of atomistic investors. This is a situation in which the relatively lower degree of social orientation of the large investor induces it to sell some of its shares to those who value them more. The risk aversion of atomistic investors limits this transfer of risk from the risk-neutral raider. The larger the difference $\pi - \theta$ or the smaller the risk premium $A\sigma^2$, the smaller is the share α^* of the firm retained by the large investor.

We need to check whether there is a majority in favour of the responsible strategy of the firm at date 2. This is the case if

$$\alpha^* + \int x_i h_i^* di \geq \frac{1}{2}.$$

This inequality may be rewritten as

$$1 - \frac{(\pi - \theta)e}{2A\sigma^2} + \pi \frac{(\pi - \theta)e}{2A\sigma^2} + \pi \frac{(1 - \pi)e}{A\sigma^2} \geq \frac{1}{2}.$$

This is equivalent to

$$-\frac{(1 - \pi)(\pi + \theta)e}{2A\sigma^2} \leq \frac{1}{2},$$

which is always true. Thus, equation (10) characterizes the optimal holding strategy of the large investor, which implies that the firm always behaves responsibly.

Proposition 4 *Suppose that* $\pi \left(1 + (1 - \pi) e/A\sigma^2\right) < 0.5$ *and* $\theta \geq c/e$. *Then, the strategic-raider equilibrium is such that*

- *(date 0) The initial owner sells the firm to the large investor at the low price* $P_0^* = \mu - A\sigma^2$;
- *(date 1) The large investor sells a fraction* $1 - \alpha^* = (\pi - \theta)e/2A\sigma^2$ *of the firm to atomistic investors at price*

$$P_1^* = \mu - c + 0.5(\pi + \theta)e.$$

Atomistic investor i holds a fraction $h_i^* = (x_i - 0.5(\pi + \theta))\, e/A\sigma^2$ of the firm;

- *(date 2) Responsible atomistic investors and the large investor vote in favor of the proposal to adopt the responsible strategy, which gets the majority;*
- *The equilibrium expected profit for the large investor is*

$$\mathbb{E}_1 U_R = A\sigma^2 + (\theta e - c) + \frac{(\pi - \theta)^2 e^2}{4A\sigma^2} \geq 0. \quad (11)$$

The expected total profit of the large investor is expressed in equation (11). The first source of profit is the risk premium $A\sigma^2$ that is ripped from the initial take-it-or-leave-it offer, as in the strategic-raider equilibrium without majority reversal. The net benefit of the majority-reversal strategy $V^* = 1$ is thus obtained by comparing this expected profit described by equations (11) and (8). For the raider, the total benefit from the majority-reversal strategy is thus:

$$(\theta e - c) + \frac{(\pi - \theta)^2 e^2}{4A\sigma^2} \geq 0. \quad (12)$$

The first term of the left hand-side of this inequality represents the raider's utility gain from making the firm socially responsible. The second term is the responsibility premium, i.e., the capital gain made by the raider when he sells back shares on the market at date 1 given his credible commitment to vote in favor of more corporate social responsibility. They are both positive. It can be positive even for the case in which θe is smaller than c. However, in this case, the large investor is unable to credibly commit on the strategy to vote in favor of corporate social responsibility. Atomistic responsible investors know this and reduce their demand for the asset at date 1. This eliminates the possibility to extract the responsibility premium.

Observe also that an increase in the social orientation of the large investor may increase its purely financial profit. There is an upward jump in profitability when θ increases from below to above the threshold c/e. If the raider is not sufficiently socially responsible, $\theta < c/e$, he votes for the non-responsible strategy at date 2. This is rationally anticipated by investors at date 1. As a consequence, the price of shares at date 1 is not high enough to induce the raider to sell any of his shares: he keeps his entire holdings up

to date 3 and has an expected wealth of $A\sigma^2$. If instead the raider is sufficiently socially responsible, $\theta \geq c/e$, he votes for the responsible strategy at date 2. Anticipating this, investors are ready to pay a high price to buy the shares at date 1. The raider then sells an amount $1-\alpha^* = (\pi-\theta)e/2A\sigma^2$ at date 1 to benefit from this high price. In general, he cannot sell his entire holdings for two reasons. On the one hand, if he sells a lot of shares on the market, investors have to bear more risk and this reduces the price. On the other hand, if he sells too many shares, he is no more pivotal. The optimal financial performance of the large investor is increased by $(\pi-\theta)^2e^2/4A\sigma^2$ when θ crosses threshold c/e. This is because the large investor is then able to modify the beliefs of atomistic responsible investors about corporate social responsibility.

We thus conclude that responsible raiders display a better financial performance than non-responsible ones if θ is larger than c/e. The underlying economic intuition for this result is that the raider's social responsibility enables him to credibly commit on voting adequately once he has established a controlling position. The non-responsible raider would also like to pretend that he is going to vote adequately in order to resell part of his holdings at an inflated price. However, such a signal by the non-responsible raider would not be credible since, after having pocketed the responsibility premium, voting in favor of the responsible strategy would translate into lower returns for him. Since voting is assumed to occur after the raider has pocketed the responsibility premium, it would be beneficial for him to deviate from his announced voting strategy in order to increase further his profits. This translates into the fact that, unless the non-responsible raider can credibly commit to vote for the costly responsible strategy, he cannot replicate the high financial performance of the responsible raider.

As discussed in the introduction, the alliance between private equity funds, such as KKR and TPG, with environment protection institutes, such as EDF and NRDC, can be explained by the willingness of financially-oriented funds to enhance the credibility of their socially responsible commitments. Such an increase in socially responsible credibility can be beneficial when the higher market capitalization it induces more than compensates the additional financial cost of pursuing socially responsible strategies. This is the case when the cost of implementing the socially responsible strategy, investors' risk aversion, and the level of risk are low enough, when the level of the externality are high enough, or when the discrepancy of the social orien-

tation between the large investor and the representative responsible investor is large enough.

3.2 Large investor's engagement towards less responsibility

The mechanism for corporate change that we described in the previous section can also be directed towards less social responsibility: a raider could take control of a firm to turn its strategy from responsible to non-responsible. We derive in this section the circumstances in which this can happen. The interpretations are symmetric so we restrict here our attention to the condition of existence of such a scenario.

In order to characterize such equilibria, let us focus on the case in which $\pi > 0.5$: absent a raider's intervention, the responsible strategy is adopted at the shareholder-voting equilibrium. In this case, in order to buy shares from the initial owner, the raider proposes a price:

$$P_0^* = \mu - c + \pi e - A\sigma^2.$$

The initial owner cannot do better than accepting the offer.

At date 1, if the raider expects to be pivotal and change the firm's strategy towards less responsibility, his expected utility is given by: $\mathbb{E}_1 U_R = (1 - \alpha) P_1^* + \alpha\mu - P_0^*$. The same computations as in the previous section show that $P_1^* = \mu - (1 - \alpha) A\sigma^2$. In this case, the optimal amount of shares that he keeps after trading at date 1 is $\alpha^* = \arg\max_\alpha \mathbb{E}_1 U_R = 1$, that is, the raider keeps all the shares. This is because, given his risk neutrality, it would not make sense for the raider to sell the risky shares to risk-averse investors. Obviously, this makes him pivotal for the firm's decision. As explained earlier, he votes against more responsibility if θ is smaller than c/e. This equilibrium is sustained by price $P_1^* = \mu$.

Proposition 5 *Suppose that $\pi > 1/2$, $\theta < c/e$ and $A\sigma^2 \geq \pi e - c$. Then, the strategic-raider equilibrium is such that*

- *(date 0) The initial owner sells the firm to the large investor at the low price $P_0^* = \mu + \pi e - c - A\sigma^2$;*

- *(date 1) The large investor does not sell shares at date 1, and the price of shares is $P_1^* = \mu \geq P_0^*$. Atomistic investors do not hold any share of the firm;*
- *(date 2) The large investor does not adopt the socially responsible strategy;*
- *The equilibrium expected profit for the large investor is*

$$\mathbb{E}_1 U_R = A\sigma^2 - (\pi e - c) \geq 0. \tag{13}$$

Overall, if the raider is not socially responsible in the sense that $\theta < c/e$, he has an interest in buying and holding the firm's shares, and in voting for the non-responsible strategy. By assuming that $A\sigma^2$ is larger than $\pi e - c$, the equilibrium price $P_0^* = \mu + \pi e - c - A\sigma^2$ in the absence of the large investor is smaller than μ, which is the large investor's valuation of the firm if he could reverse the pro-social strategy of the firm. This is actually done by purchasing and retaining 100% of the firm's shares.

This section shows that firms that are socially responsible might be the targets of takeovers by non-responsible raiders. This occurs when the proportion of responsible investors and the level of externality are low, and when the cost of corporate social responsibility, investors' risk aversion and the level of risk are high. The idea for purely financial raiders is to profit from the low share price that prevails for responsible firms in this case.

4 Conclusion

This paper studies asset pricing and corporate governance when some investors are socially responsible in the sense that they take into account the externalities generated by a firm when making their investment decisions. These externalities are then partially incorporated into its share price. When investors differ in their social orientation, there is a conflict of interest between the potential shareholders of the firm over corporate social responsibility. To resolve this conflict, we consider that investors vote between a strategy that is financially profitable for the firm and a strategy (the responsible strategy) which is less financially profitable in the short run but is desirable from a social point of view.

We first study a situation in which investors are atomistic. We determine under what circumstances corporate social responsibility will be favored by the shareholders of the firm. We show that this is the case if the externality and the proportion of responsible investors are large enough, and if investors' risk aversion and the level of risk are low enough. When it is not the case, at equilibrium, the purely financial strategy is adopted after the vote. When the cost of the responsible strategy is low enough, the market capitalization of the firm is higher if it is socially responsible.

We focus on this case and study the impact of a large investor who stands ready to acquire a pivotal stake in the firm. This large investor may acquire the company when it is non-responsible and turn it into responsible. This enables to sell back part of the shares at a higher price to socially responsible investors. Not all the shares can be sold back because the large investor has to be pivotal at the future shareholder meetings. The profitability of this raid crucially depends on the fact that the large investor has a socially responsible orientation.

This paper offers some theoretical support to the claim that socially responsible investors can enjoy a higher stock market performance than non-responsible investors. We show that this higher performance requires not only to invest with a long-term perspective but also to take control of non-responsible firms (and turn them into responsible ones). Our theory predicts that the higher risk-adjusted stock market returns go along with a potential increase in the firm financial performance (if the externality eventually materializes into financial cash-flows) and with an increase in its social performance.

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