Why Do Socially Concerned Firms Provide Low-powered Incentives to Their Managers?

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Abstract: We introduce a mixed quantity-setting duopoly with a socially concerned firm and a profit-maximizing firm to derive a firms' optimal combination of the organization's type, the structure of managerial compensation and its manager's type. Both firms delegate the quantity choice to managers who can be either selfish – solely interested in monetary compensation – or intrinsically motivated – partially interested in the goal of the firm. Although we show that both firms prefer to hire an intrinsically motivated manager to save on compensation costs, only for the socially concerned firm it has a strategic value. The structure of the manager's optimal compensation contract depends on the organization's type. The profit-maximizing firm always prefers to use strategic incentives based on profit and sales revenue. In contrast, for the socially concerned firm it is preferable to use a fixed wage to compensate its manager if the level of social concern is sufficiently high. We further discuss the endogenous choice of an optimal social strategy and demonstrate that in a strategic setting profit-maximizing investors might benefit if they commit to consider the welfare of consumers and rely on the intrinsic motivation of the firm's manager. In short, our paper studies the optimal combination of three different commitment devices in a duopoly and provides a justification for the recent increase of social responsibility as a competitive strategy and the widespread use of low-powered incentives in socially concerned firms.

Keywords: Intrinsic motivation; Managerial compensation structure; Social strategy; Strategic incentives.

JEL-Classification: D03, D21, L13, L22, M14, M52.

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1 Introduction

In this paper we study the firm's optimal governance package in a mixed duopoly. In detail, we are interested in the optimal combination of a firm's strategic orientation (socially concerned or profit-maximizing), the managerial compensation system (bonus-based strategic incentives or fixed salary), and the influence of a manager's type (selfish or intrinsically motivated) in an imperfectly competitive market environment. There is systematic empirical evidence that different types of firms use different compensation mechanisms to remunerate and motivate their managers and that the (optimal) combination of strategic orientation and internal governance determines an organization's performance (e.g. Roberts 2004, Hermalin and Wallace 2001, Milgrom and Roberts 1995). For example, Ballou and Weisbrod (2003) postulate that "... the incentives provided by any organization through its executives' compensation are likely to reflect the organization's objectives..." (p. 1897). In their study of the hospital industry, they find a strong link between an organization's objective and the firm's compensation mechanisms. Matolcsy and Wright (2011) argue that compensation structure should be chosen based on the economic characteristics of the firm and use Australian firm data to show that an inconsistency leads to lower firm performance. Chen and Jermias (2013) find that a product differentiation strategy goes hand in hand with performance-linked compensation and that a misfit between business strategy and compensation structure has negative effects on performance.[1]

Even more detailed conclusions can be drawn by comparing profit-maximizing firms (henceforth PMFs) with organizations which in addition to the profit motive also try to consider the welfare of other stakeholders. While PMFs often use high-powered incentives, e.g. bonuses, firm stocks, or stock options, to provide incentives to their top managers, socially concerned firms (henceforth SCFs) built on stakeholder welfare generally rely on much lower-powered incentive contracts or even fixed salaries, but compensate this by a stronger emphasis on different governance mechanisms (see e.g. Ntim and Soobaroyen 2013).[2] Miles and Miles (2013) find that SCFs put restrictions on executive pay, but still achieve good financial performance. McGuire et al. (2003) find that bonuses and long-term incentives have limited association with strong social performance and argue that this supports the claim that social performance is primarily due to managerial beliefs or corporate culture. They further point out that socially pro-active CEOs may avoid firms in which "bottom-line" orientation dominates. Frye et al. (2006) show that the structure of executive compensation in socially responsible (SR)

[1] Further evidence for high-technology firms is provided by Yanadori and Marler (2006). For detailed studies on the benefits of alignment between strategy and governance structure, see also Sampson (2004) and Yin and Zajac (2004).

[2] Similar evidence can be found for cooperatives and other nonprofit firms; see Kopel and Marini (2012), Glassman and Spahn (2012), Jegers (2009).

firms and in non-SR firms differs significantly. They provide evidence that the pay-performance sensitivity in SR firms is much lower than in non-SR firms and argue that SR firms attract higher-quality employees (for further empirical evidence see Grolleau et al. 2012). Webb (2004) shows that SR firms are better able to minimize agency costs through effective board structure arrangements. Cai et al. (2011) find evidence for the conflict-resolution hypothesis, which says that CEOs of SR firms accept lower pay for ethical and fairness reasons and to mitigate potential conflicts with stakeholders (see also Jo and Harjoto 2011).

Given the systematic empirical evidence for low-powered incentives in socially concerned firms, which insights are provided by state-of-the-art theoretical treatments? Several reasons have been advanced in (behavioral) agency theory and management literature (Cuevas-Rodriguez et al. 2012, Pepper and Gore 2012, Larkin et al. 2012, Francois and Vlassopoulos 2008). First, there is the difficulty of measuring nonprofit goals on which explicit performance contracts could be based (Berrone and Gomez-Mejia 2009, Perego and Hartmann 2009, Eccles et al. 2012, Lothe and Myrtveit 2003, Tirole 1994). Tirole (2001) raises the point that there is no accounting measure of stakeholders' welfare and no market value which measures the impact of management's decision on welfare. Therefore, he concludes, it is best for the stakeholder society if management is compensated by a flat salary rather than a performance-based contract. Management incentives should come from implicit incentives and career concerns.[3] Second, firms which are socially concerned select or attract employees who are self-motivated or have preferences which are aligned with the organization's objective (Cai et al. 2011, Leete 2000, Minkler 2004, Akerlof and Kranton 2000, 2005, Campbell 2012, Bandiera et al. 2011, Prendergast 2008, Van den Steen 2010, Brekke and Nyborg 2008, Besley and Ghatak 2005). In this case, providing explicit incentives to the manager might crowd out intrinsic motivation (Sliwka 2007, Bénabou and Tirole 2003, Englmaier and Leider 2012, Canton 2005, Francois 2007, Glazer 2004, Frey 1997) or pro-social behavior (Bénabou and Tirole 2006, Ellingsen and Johannesson 2007, 2008, Fischer and Huddart 2008, Ariely et al. 2009, Fehr and Falk 2002). Finally, using high-powered incentives might conflict with a broader mission of the organization based on stakeholder welfare (Berrone and Gomez-Mejia 2009, McGuire et al. 2003, Frye et al. 2006).

Although all these arguments certainly contribute to our understanding of low-powered incentives in SCFs, in this paper we argue that the list of reasons is incomplete. Firms still might benefit from providing *strategic incentives* to their managers. As recent empirical evidence demonstrates, product market competition and strategic interaction between firms shape incentive contracts and internal governance substantially (see, for example, Karuna 2007, Cunat and Guadalupe 2005, Vroom and Gimeno 2007). In an oligopolistic market environment, observable and explicit incentive contracts can be used by the owners (or the board

[3] In a recent laboratory experiment, Ederer and Manso (2013) even show that in tasks where exploration and creativity is required for long-term success, fixed-wage contracts outperform pay-for-performance contracts. Tonin and Vlassopoulos (2012) demonstrate with their experiment that social incentives (e.g. donations) implemented by a CSR policy induces a 20 % rise in productivity.

of directors) to influence the behavior of the rival firms in order to obtain a competitive advantage (e.g. Sengul et al. 2012, Kopel and Löffler 2012, 2008). The seminal papers by Fershtman and Judd (1987), Vickers (1985), Fershtman (1985), Sklivas (1987), and later contributions demonstrate that in an imperfectly competitive market environment it might be beneficial for firms to delegate the tactical decisions of setting prices or quantities to managers. The owners can use incentive contracts based on observable and verifiable performance measures like profit, sales revenue, or market share to manipulate the decisions of the manager and thereby to strategically influence the behavior of the rival firms. In other words, the owners can use the managers and their compensation contracts as a strategic commitment device to gain a Stackelberg leader position (Basu 1995).

In the present paper we consider a *mixed* quantity-setting duopoly where a profit-maximizing firm competes against a socially concerned firm which considers profit and a share of consumer surplus. We study the following game between the two firms. In the first stage, the firms can either hire a selfish manager type who derives utility solely from monetary compensation, or they can hire an intrinsically motivated manager type who (in addition to monetary compensation) identifies to some extent with the employer's objective (see also Sliwka 2007, Ellingsen and Johannesson 2007, 2008, Englmaier and Leider 2012, Makris 2009, Lacetera and Zirulia 2012). The firms can also decide on the structure of the managerial compensation package. They can either choose strategic incentives based on profit and sales revenue or offer a fixed wage to their manager. In the second stage, in case a strategic incentive contract is offered, the optimal weights put on profit and sales revenue are determined. Finally, the manager selects the quantity for the (homogeneous) product market such that the manager's utility is maximized. In contrast to the classical strategic delegation literature, we analyze the interplay of three commitment devices: a firm's objective, its managerial compensation system, and the manager's type.

We demonstrate that the structure of the compensation package offered to the manager drastically differs between different types of firms. The PMF always prefers to use strategic incentives to make its manager more aggressive at the market stage. For a PMF hiring an intrinsically motivated manager just saves on compensation costs, but (as we show) implements the same market actions as a corresponding contract designed for a selfish manager (and consequently has no further strategic impact). We also show that the SCF prefers to hire an intrinsically motivated manager and optimally compensates this manager with a fixed wage if the firm's social concern is sufficiently high. In the final section of the paper, we also address the question if it is in the interest of profit-maximizing shareholders to invest in a SCF and study the issue of a profit-maximizing social strategy (Husted and Allen 2011, Starks 2009). What we find is that it pays off to be socially responsible, because in equilibrium, the SCF's profit is higher than the profit of its competitor. Hence, our analysis confirms that profit-maximizing firms in markets with strategic interaction are not the best survivors (Schaffer 1989).[4]

[4]Riyanto and Toolsema (2007) cynically refer to this as "corporate hypocrisy" since the shareholders are in fact interested in maximizing profits but commit to a different objective

Our paper contributes to the behavioral agency literature by providing another reason for the widespread use of low-powered incentives in mission-oriented firms. The difference of our approach to this literature is that we do not focus on "information-based, strategic analysis" (Bénabou and Tirole 2003), but on the optimal combination of strategic incentive contracts, a firm's strategic orientation, and the type of its manager under imperfect competition.[5] Our findings also substantiate Gary Becker's (2008) assessment that "[C]ompanies that combine the profit motive with environmental and other concerns can thrive in a competitive environment only if they are able to attract employees and customers who also value these other corporate goals", and associate it with a strategic commitment effect. Our paper also contributes to the rather extensive literature on strategic delegation in mixed oligopoly, which typically considers imperfect competition between private and public firms (e.g. Barros 1995, Barcena-Ruiz 2009, White 2001) or private and socially concerned firms (Kopel and Brand 2012, Goering 2007). In contrast to our paper, this literature simply focuses on selfish agents who just consider their monetary payments. The paper is structured as follows. In section 2 we introduce the model and in section 3 we derive the subgame-perfect outcome. The final section concludes.

2 Model

Two firms compete in quantities for homogeneous products.[6] The inverse demand function is linear,

$$p = a - b(x_P + x_S), \tag{1}$$

where p is the price and $a, b > 0$. The variables x_P and x_S denote the quantity offered by the profit-maximizing firm (PMF) and the socially concerned firm (SCF) respectively. Both competitors have identical unit costs c with $a > c$. The PMF maximizes its profit given by,

$$\pi_P = (a - b(x_P + x_S) - c)x_P. \tag{2}$$

For the SCF, we follow Sen and Sikdar (1997), who remark that: "... in a 'reduced form' sense, any given organizational form can be characterized in terms of its

function to raise the firm's payoffs. We are less negative about firms which implement a social strategy not for altruistic reasons, but in order to obtain a competitive advantage (e.g. Husted and Allen 2011, Starks 2009). In the model of Riyanto and Toolsema (2007), the (strategic) commitment to CSR and the threat of an activist save monitoring costs and lead to an increase in the manager's effort. In our model, implementing a social strategy leads to an increase in market share and reduces the rival firm's profit.

[5] See Kräkel (2004) for a discussion and a comparison of information-based and strategic effects. Heifetz et al. (2007) show that the results obtained in the strategic incentives literature are in fact generic: "That is, in almost every strategic interaction hiring a delegate whose preferences differ from the player's own preferences is beneficial to the player because of its resulting effect on opponents' play." (p. 41). Our findings demonstrate that this is not necessarily true if the delegate is intrinsically motivated.

[6] For simplicity, we focus on the case of symmetric costs and homogeneous products. All results still hold if products are differentiated and the firms' unit costs do not differ too much.

objective(s) alone." (p. 539). The SCF is assumed to maximize profit π_S plus a share θ of consumer welfare measured by consumer surplus (CS),

$$V_S = \pi_S + \theta\, CS = (a - b(x_P + x_S) - c)x_S + \theta \left[\frac{b(x_P + x_S)^2}{2}\right]. \tag{3}$$

With this formulation of the SCF's objective, we aim to capture a socially concerned firm's hybrid strategy which is focused on two of its main stakeholders.[7] The SCF considers its responsibilities towards its shareholders, but also takes the impact on consumers into account.[8] The parameter $\theta \in [0, 1]$ captures the degree of the firm's social concern. For $\theta = 0$, the SCF behaves like a profit-maximizer. By varying the weight θ put on consumer surplus in its firm objective function, the SCF's owners can choose an appropriate combination of profit and nonprofit goals (Bromberger 2011, Porter and Kramer 2011).[9] Throughout most parts of the paper, we assume that the parameter θ which captures the firm's social strategy is exogenously fixed. In our discussion of the overall equilibrium of the game, we will also consider the case where θ is chosen endogenously by profit-maximizing owners of the SCF. Hence, we consider the SCF's social strategy as a commitment device to achieve a competitive advantage in an imperfectly competitive market and not as some form of altruism.

Both firms can hire either one of two types of managers, selfish or intrinsically motivated, to determine the production quantity at the market stage. A selfish manager just wants to maximize compensation whereas an intrinsically motivated manager partially identifies with the objective of the firm (e.g. Sliwka 2007, Murdock 2002, Lacetera and Zirulia 2012). In line with the focus of this paper on the effects of strategic commitment, we assume that the type of manager is observable (see, e.g., Englmaier and Reisinger 2013, Englmaier 2010, Miller and Pazgal 2002, Goering 1996). For example, a manager's history of employment and a manager's past business decisions reveal if the manager takes actions to solely maximize compensation or if the manager considers the actions' impact on other stakeholders as well. Following the strategic incentives literature, we further

[7] In their empirical study, Berman et al. (1999) find support for the strategic stakeholder management model, which says that managerial concern for a stakeholder group is determined by its impact on financial performance. They found that out of five stakeholder areas (employees, the natural environment, workplace diversity, customers, community relations) only two are related to firm financial performance: customers and employees.

[8] In their book, Husted and Allen (2011) put it in the following way: "Neither shareholders nor stakeholders are 100 percent oriented towards profits nor 100 percent oriented toward social benefits. Nearly all stakeholders would like to see a profitable firm that also makes a contribution to society. Finding the right balance is the real challenge." (p. 20)

[9] A linear combination of profit and non-profit goals has been used in the frequently to capture a socially concerned firm's objective, see e.g. Kopel and Brand (2012), Goering (2007, 2012), Lambertini and Tampieri (2010), Brand and Grothe (2013a, 2013b) and Kelsey and Milne (2008). Königstein and Müller (2001) use an evolutionary setting to show that firms can benefit from considering profit plus consumer surplus. Brekke et al. (2012) use a similar objective function to capture the incentives of altruistic firms facing profit constraints in imperfect competition. Work on mixed oligopoly with private firms and semi-public firms uses a combination of profit and welfare, see e.g. White (2002), Matsumura (1998).

assume that managers are risk-neutral.[10] The utility of a manager is given by

$$U_i = M_i + \mu_i O_i, \qquad i = P, S \tag{4}$$

where M_i denotes manager i's monetary compensation, $O_P = \pi_P$, and $O_S = V_S$. The parameter $\mu_i \in [0, 1]$ captures the degree of intrinsic motivation, i.e. how much the manager of firm i identifies with a firm's objective O_i. For $\mu_i = 0$ the manager is selfish and for $\mu_i > 0$ the manager is intrinsically motivated. A higher value of μ_i represents a higher degree of intrinsic motivation. Managerial compensation M_i includes a fixed salary and owners may include a variable (strategic) incentives component based on a linear combination of profit $\pi_i = (p_i - c)\, x_i$ and sales revenue $R_i = p_i\, x_i$ (see, e.g., Fershtman and Judd 1987).[11] Hence the managers' total compensation is

$$M_i = A_i + B_i[(1 - \gamma_i)\pi_i + \gamma_i\, R_i], \tag{5}$$

where A_i denotes the fixed salary and the variable $B_i \in \{0, 1\}$ determines if the variable incentive component is included, $B_i = 1$, or not, $B_i = 0$.[12] Note that strategic incentives are provided by choosing the optimal weight, γ_i, given to profit and sales in the variable component. The owners of the PMF aim to maximize firm profit net of compensation, $\pi_P - M_P$, while the owners of the SCF maximize value net of compensation, $V_S - M_S$. Each manager's utility U_i has to be equal to or larger than the reservation utility $\underline{U}$.

Our model consists of multiple stages. In stage one, both firms simultaneously select the manager type, either selfish ($\mu_i = 0$) or intrinsically motivated ($\mu_i > 0$), and the type of contract (incentive-based $B_i = 1$ or fixed salary $B_i = 0$). In the second stage, if $B_i = 1$ strategic incentives γ_i are chosen subject to the reservation constraint. Finally, managers select quantities x_i to maximize utility. Our setting enables us to study the interplay between the firm's type (SCF or PMF), strategic incentives provided by an explicit incentive contract and the intrinsic motivation of a manager ($\mu_i > 0$).[13] We solve this game by backward induction and the equilibrium concept used is subgame perfection.

[10] One should keep in mind, however, that informational uncertainty, e.g. about the market environment, plays a crucial role in models with strategic incentives. Under symmetric information the owners could simply write a forcing contract. However, as Merzoni (2000) and Fershtman and Judd (1987) demonstrate, asymmetric information does not alter the crucial impact of strategic incentives.

[11] We assume that the SCF's objective, in particular consumer surplus, is non-contractible.

[12] Our analysis holds for any value $B_i > 0$. We have chosen $B_i = 1$ for notational convenience and to keep the mathematical analysis tractable. Since in equilibrium the manager's utility is equal to the reservation utility, this choice is without limitation of generality.

[13] Note that in contrast to moral hazard models where the focus is on aligning the goals of the owners and the manager, in strategic incentives models the manager serves as a commitment device for more aggressive (or collusive) behavior at the market stage. In our model, firms can further commit through the choice of manager type. Additionally, the SCF has a further commitment device through its objective function. For a detailed analysis of the SCF's commitment effect through its objective function, see Fershtman (1990) and Kopel and Brand (2012).

3 Analysis of the game

To solve the game, we have to study several cases (subgames) which result from the following choices of the two firms. First, each firm can select $(B_i = 1, \mu_i = 0)$, that is include strategic incentives in the compensation contract and hire a selfish manager. This benchmark case is standard in the strategic incentives literature where it is assumed that the manager tries to maximize compensation. Second, each firm can select $(B_i = 1, \mu_i > 0)$, that is include strategic incentives in the compensation contract and hire an intrinsically motivated manager. This case follows the more recent line of research which takes the interplay between compensation and the manager's attitude towards the firm into account. Obviously, for reasons of continuity these two cases can be treated together by assuming $\mu_i \geq 0$ and the optimal type of manager (selfish or intrinsically motivated) follows by analyzing the change of the payoffs if μ_i is increased. Finally, each firm can select $(B_i = 0, \mu_i > 0)$, that is pay a fixed salary to the manager and compete in the market by relying on the manager's intrinsic motivation. This case serves as a check if strategic incentives which make the manager more aggressive at the market stage are even beneficial if the manager is partially interested in the goal of the firm. Summarizing, we have to analyze four combinations (subgames).

Before we proceed with the analysis of the subgames, consider the second stage where the owners determine the strategic incentives γ_i assuming $B_i = 1$. The corresponding optimization problems can be written as

$$\max_{\gamma_i} \; O_i - M_i \qquad \text{s.t. } U_i \geq \underline{U},$$

where $U_i = M_i + \mu_i O_i$, $i = P, S$ and $O_P = \pi_P, O_S = V_S$. Since in equilibrium the participation constraint is binding, we get $M_i = \underline{U} - \mu_i O_i$, and the owners' optimization problem at stage 2 of the game can be re-written as

$$\max_{\gamma_i} \; (1 + \mu_i) O_i - \underline{U}. \tag{6}$$

Note that the profits net of compensation are $\pi_S + \mu_S V_S - \underline{U}$ for the SCF and $(1+\mu_P)\pi_P - \underline{U}$ for the PMF. The normal form game depicted in Table 1 includes the payoffs (before compensation) resulting from the corresponding subgames where B stands for the case where strategic incentives are used ($B_i = 1$ for bonus) and F stands for the case of a fixed salary ($B_i = 0$).[14] Solving the normal form game yields the subgame-perfect outcome of the game.[15]

3.1 Ruling out subgames BF and FF

To reduce the number of subgames we have to analyze, we prove some preliminary results which show that subgames BF and FF can never be part of a

[14] The combination "selfish manager and fixed salary" is not considered since the manager's objective is not properly defined.

[15] Note that the payoffs net of compensation are just a linear transformation of gross payoffs. Therefore, the equilibrium can be derived using the (gross) payoffs given in the table.

		PMF	
		$B_P = 1, \mu_P \geq 0$	$B_P = 0, \mu_P > 0$
SCF	$B_S = 1, \mu_S \geq 0$	V_S^{BB}, π_P^{BB}	V_S^{BF}, π_P^{BF}
	$B_S = 0, \mu_P > 0$	V_S^{FB}, π_P^{FB}	V_S^{FF}, π_P^{FF}

Table 1: Normal form capturing firms' choice of manager's type and compensation's structure.

subgame-perfect equilibrium. First, we demonstrate that the PMF prefers to hire an intrinsically motivated manager to save on compensation costs, but that this has no further strategic effects at the market stage in terms of a higher market quantity. Then we show that the PMF always prefers to include strategic incentives in the contract and that a fixed wage contract is never optimal. As a consequence, we know that the PMF always chooses $(B_P = 1, \mu_P > 0)$ and we are left with only two subgames, BB and FB, to consider in detail.

To show the first point, rewrite the utility of the PMF's intrinsically motivated manager as follows:

$$\begin{aligned} U_P &= A_P + B_P[(1-\gamma_P)\pi_P + \gamma_P R_P] + \mu_P \pi_P \\ &= A_P + (B_P + \mu_P)[(1 - \tfrac{B_P}{B_P+\mu_P}\gamma_P)\pi_P + \tfrac{B_P}{B_P+\mu_P}\gamma_P R_P]. \end{aligned}$$

Obviously, this expression has the same structure as the utility of a selfish manager ($\mu_P = 0$) given strategic incentives and the term $B_P/(B_P + \mu_P)$ is just a scaling factor of the weights put on profit and sales revenue. As a result, since γ_P is chosen by the owners to maximize profits, the same market quantity will be induced by a strategic incentive contract for both types of managers, $\mu_P = 0$ or $\mu_P > 0$, with a properly calibrated weight γ_P. In other words, the PMF does not benefit from using an intrinsically motivated manager as a commitment device in oligopolistic competition, but hires this type of manager only to save on compensation costs (since $M_P = \underline{U} - \mu_P \pi_P$). We will see that, in contrast, for a SCF hiring an intrinsically motivated manager not only saves compensation costs but also has strategic benefits.

To show the second point that a PMF always benefits from strategic incentives, we look at the strategic effects of increasing γ_P. A PMF manager's utility function is given by

$$\begin{aligned} U_P &= A_P + B_P[(1-\gamma_P)\pi_P + \gamma_P R_P] + \mu_P \pi_P \\ &= A_P + (B_P + \mu_P)\pi_P + B_P \gamma_P \, c \, x_P. \end{aligned} \tag{7}$$

Observe that for $\gamma_P = 0$ the manager chooses the same (profit-maximizing) market quantity as for a fixed wage contract ($B_P = 0$). Therefore, the PMF's payoffs for $\gamma_P = 0$ and for a fixed wage contract are identical. Consequently, if we can show that the owners prefer $\gamma_P > 0$, then it is beneficial for the PMF to use strategic incentives instead of a fixed wage contract. To see that the owners prefer

$\gamma_P > 0$ consider the following strategic effects. At the market stage, the PMF's manager chooses the quantity such that the manager's utility (7) is maximized. Hence, the first-order condition is given by

$$\frac{\partial U_P}{\partial x_P} = (B_P + \mu_P)\frac{\partial \pi_P}{\partial x_P} + B_P \gamma_P \, c = 0 \implies \frac{\partial \pi_P}{\partial x_P} = \frac{-B_P \gamma_P \, c}{B_P + \mu_P}. \tag{8}$$

At the the contract design stage, the owners select the weight γ_P such that $(1+\mu_P)\pi_P - \underline{U}$ is maximized. Hence, the first-order condition is

$$\frac{\partial \pi_P}{\partial \gamma_P} = (1+\mu_P)[\underbrace{\frac{\partial \pi_P}{\partial x_P}}_{\frac{-B_P \gamma_P \, c}{B_P + \mu_P}} \frac{\partial x_P^*}{\partial \gamma_P} + \underbrace{\frac{\partial \pi_P}{\partial x_S}}_{-b\, x_P} \frac{\partial x_S^*}{\partial \gamma_P}]$$

where we have used (8). For $\gamma_P = 0$, the first term in the brackets vanishes. The first term of the second expression, $-bx_P$, is negative. Consequently, in order to show that $\frac{\partial \pi_P}{\partial \gamma_P}\Big|_{\gamma_P = 0} > 0$, we have to prove that $\frac{\partial x_S^*}{\partial \gamma_P} < 0$. Intuitively, it is easy to see that this inequality holds. Increasing the weight γ_P in the strategic incentive part of the contract is like increasing the sales quota in a piece-rate contract with a bonus of $B_P \gamma_P c$, see the second line of (7). Hence for higher γ_P, the PMF's manager will choose a higher quantity x_P. Since in quantity competition, the firms' market quantities are strategic substitutes, the SCF will (ceteris paribus) reduce its market quantity x_S. Hence, a higher weight γ_P leads to lower competitor's quantity x_S. More formally, $\frac{\partial x_S^*}{\partial \gamma_P} < 0$. We will provide the solutions of the subgames in more detail below and we will show that the arguments provided here are indeed correct. As a result, the PMF always chooses a positive incentive parameter, $\gamma_P > 0$. Summarizing, our analysis so far yields the following insights.

Proposition 1: The PMF always benefits from using strategic incentives ($B_P = 1$). The PMF prefers to attract an intrinsically motivated manager ($\mu_P > 0$) to save compensation costs, but does not benefit from using this manager as a commitment device.

Proof: Follows from the arguments provided above.

As a consequence, only two subgames, BB and FB, are left to be studied in detail, since ($B_P = 0, \mu_P > 0$) in the normal form game in Table 1 is dominated. First, we have subgame BB where the SCF includes a strategic incentive component in the contract ($B_S = 1, \mu_S \geq 0$). Second, we have subgame FB where the SCF pays a fixed wage and relies on the intrinsic motivation of the manager ($B_S = 0, \mu_S > 0$). A comparison of the resulting payoffs of these two subgames then yields the overall equilibrium of the game.

3.2 Subgame BB: SCF provides strategic incentives

In this section we analyze subgame BB where both firms provide strategic incentives to their managers. In stage 3, each manager selects the firm's quantity

offered at the market such that utility U_i given in (4) is maximized. From the first-order conditions[16], the following Nash quantities are obtained,

$$x_P^*(\gamma_P, \gamma_S) = \frac{(a-c)Y(Z-\mu_S\theta) + c(\gamma_P(2(Z-\mu_S\theta)-\gamma_S Y)}{bY(3Z-\mu_S\theta)},$$

$$x_S^*(\gamma_P, \gamma_S) = \frac{(a-c)Y(Z+\mu_S\theta) - c(\gamma_P(Z-\mu_S\theta)-2\gamma_S Y)}{bY(3Z-\mu_S\theta)},$$

where $Y = 1+\mu_P$ and $Z = 1+\mu_S$. Note that

$$\frac{\partial x_S^*}{\partial \gamma_P} = -\frac{c(Z-\mu_S\theta)}{bY(3Z-\mu_S\theta)} < 0,$$

which shows that our arguments presented in the last subsection are indeed correct. Inserting the quantities into the firms' objective functions yields the reduced form payoffs $\pi_P(x_P^*(\gamma_P,\gamma_S), x_S^*(\gamma_P,\gamma_S))$ and $V_S(x_P^*(\gamma_P,\gamma_S), x_S^*(\gamma_P,\gamma_S))$.

In stage 2, each firm has to choose the strategic incentives by selecting $\gamma_i, i \in \{P,S\}$ such that the firm's objective function given in (6) is maximized. From the first-order conditions we get

$$\gamma_P^{BB} = \frac{(a-c)(1-\theta)(1+\mu_P)(1+\mu_S-\theta\mu_S)}{c((5-\theta)(1+\mu_S)-\theta\mu_S)} > 0 \qquad \text{for} \qquad \theta < 1,$$

$$\gamma_S^{BB} = \frac{(a-c)(\mu_S^2(1-\theta)+1+3\theta+\mu_S(2+2\theta-\theta^2))}{c((5-\theta)(1+\mu_S)-\theta\mu_S)} > 0.$$

Both incentive parameters are positive for $\theta < 1$. Consequently, both firms use strategic incentives to make the manager more aggressive at the market stage. Using these equilibrium incentive parameters γ_i^{BB} yields the following subgame-perfect outcome:

$$x_P^{BB} = \frac{(a-c)(1-\theta)(2(1+\mu_S)-\mu_S\theta)}{b((5-\theta)(1+\mu_S)-\theta\mu_S)},$$

$$x_S^{BB} = \frac{(a-c)(2(1+\theta)(1+\mu_S)-\mu_S\theta^2)}{b((5-\theta)(1+\mu_S)-\theta\mu_S)},$$

$$\pi_P^{BB} = \frac{(a-c)^2(1+\mu_S)(1-\theta)^2(2(1+\mu_S)-\mu_S\,\theta)}{b((5-\theta)(1+\mu_S)-\theta\mu_S)^2},$$

$$\pi_S^{BB} = \frac{(a-c)^2(1+\mu_S)(1-\theta)(2(1+\theta)(1+\mu_S)-\mu_S\theta^2)}{b((5-\theta)(1+\mu_S)-\theta\mu_S)^2},$$

$$V_S^{BB} = \frac{(a-c)^2(4(1+\mu_S)^2(1+4\theta)-2(1+\mu_S)(2+7\mu_S)\theta^2+\mu_S(2+3\mu_S)\theta^3)}{2b((5-\theta)(1+\mu_S)-\theta\mu_S)^2}.$$

[16] For all maximization problems the second-order conditions are fulfilled.

The following proposition provides further insights about the outcomes and payoffs in this subgame.

Proposition 2: In subgame BB, where both firms use strategic incentives the following holds.

1. Both firms prefer to hire an intrinsically motivated manager. Moreover, for the SCF its manager serves as an additional strategic commitment device.

2. Both firms use strategic incentives to make their manager more aggressive for all $\theta < 1$.

3. The SCF offers a higher quantity than the PMF and achieves a higher (gross) profit than its profit-maximizing competitor.

Proof: To show the first point, notice that the equilibrium payoffs and outcomes are independent of μ_P. Consequently, the PMF prefers an intrinsically motivated manager to save compensation costs (which are $M_P = \underline{U} - \mu_P \pi_P$), but this does not have an impact on the game's outcome as we have already argued in the previous subsection. The SCF also prefers to hire an intrinsically motivated manager since for all values of μ_S we have

$$\frac{\partial V_S^{BB}}{\partial \mu_S} = \frac{(a-c)^2(1+\mu_S)(4-\theta)(1-\theta)^2\theta}{b((5-\theta)(1+\mu_S)-\theta\mu_S)^3} > 0 \qquad \text{for} \qquad 0 < \theta < 1,$$

and likewise, $\partial \pi_S^{BB}/\partial \mu_S > 0$. Additionally, since

$$\frac{\partial \pi_P^{BB}}{\partial \mu_S} = -\frac{(a-c)^2(\mu_S+1-\theta)(1-\theta)^2\theta}{b((5-\theta)(1+\mu_S)-\theta\mu_S)^3} < 0 \qquad \text{for} \qquad 0 < \theta < 1,$$

hiring an intrinsically motivated manager improves the SCF's competitive position due to a strategic effect on the PMF's manager.
The proof of the second point follows immediately from the fact that $\gamma_P^{BB} > 0$ and $\gamma_S^{BB} > 0$.
The third point follows since

$$x_S^{BB} - x_P^{BB} = \frac{(a-c)\theta(4+\mu_S(5-2\theta))}{b((5-\theta)(1+\mu_S)-\theta\mu_S)} > 0.$$

Since the market price and unit costs are identical for both firms, the SCF achieves a higher (gross) profit than the PMF. □

We close this subsection with a comparison of the net profits of the two firms. Recall that the SCF's profit net of compensation is $\pi_S + \mu_S V_S - \underline{U}$ and the PMF's net profit is $(1+\mu_P)\pi_P - \underline{U}$. Consequently, by using the result that $\pi_S^{BB} > \pi_P^{BB}$, we conclude that a sufficient condition for $\pi_S^{BB} + \mu_S V_S^{BB} > (1+\mu_P)\pi_P^{BB}$ is that $\mu_S > \mu_P$. In other words, if the SCF can attract a manager with a higher level of intrinsic motivation, then the SCF's net profit is guaranteed to be higher than the PMF's net profit.

3.3 Subgame FB: SCF pays a fixed salary

We now consider the subgame where the SCF does not use strategic incentives ($B_S = 0$), pays a fixed salary to its manager, and relies on its manager intrinsic motivation. In the third stage, the managers select the quantity so that their corresponding utility in (4) is maximized. Since $U_S = A_S + \mu_S V_S$, the manager's intrinsic motivation μ_S does not influence the quantity choice and does not have the same strategic effect as in subgame BB. Both firms prefer to hire intrinsically motivated managers to save compensation costs. The first-order conditions yield the Nash quantities,

$$x_P^*(\gamma_P) = \frac{(a-c)(1+\mu_P)(1-\theta) + c\gamma_P(2-\theta)}{b(1+\mu_P)(3-\theta)},$$

$$x_S^*(\gamma_P) = \frac{(a-c)(1+\mu_P)(1+\theta) - c\gamma_P(1-\theta)}{b(1+\mu_P)(3-\theta)}.$$

As expected, $\partial x_P^*/\partial \gamma_P > 0$ and $\partial x_S^*/\partial \gamma_P < 0$. Inserting these quantities into the profit function of the PMF results in the reduced-form expression $\pi_P(x_P^*(\gamma_P), x_S^*(\gamma_P))$. In the second stage, the PMF's maximization problem results in the following value of the incentive parameter

$$\gamma_P^{FB} = \frac{(a-c)(1+\mu_P)(1-\theta)^2}{2c(2-\theta)} > 0 \quad \text{for} \quad \theta < 1.$$

The equilibrium outcomes and (gross) payoffs are obtained by inserting γ_P^{FB} into the reduced form payoffs and quantities,

$$x_P^{FB} = \frac{(a-c)(1-\theta)}{2b}, \qquad x_S^{FB} = \frac{(a-c)((2-\theta)\theta+1)}{2b(2-\theta)},$$

$$\pi_P^{FB} = \frac{(a-c)^2(1-\theta)^2}{4b(2-\theta)},$$

$$\pi_S^{FB} = \frac{(a-c)^2(\theta^3-3\theta^2+\theta+1)}{4b(2-\theta)^2},$$

$$V_S^{FB} = \frac{(a-c)^2(1+3\theta(2-\theta))}{8b(2-\theta)}.$$

The main results for subgame FB are summarized in the following proposition.

Proposition 3: In subgame FB, where the SCF pays a fixed salary and relies on its manager's intrinsic motivation, the following results are obtained.

1. Both firms hire intrinsically motivated managers to save compensation costs.
2. The PMF uses strategic incentives to make its manager more aggressive at the market stage.
3. The SCF offers a higher quantity and achieves a higher (gross) profit than its profit-maximizing competitor for all $\theta > \frac{5-\sqrt{17}}{4}$.

Proof: The first point is obvious, since the net payoffs are $(1+\mu_i)O_i - \underline{U}$, but the gross payoffs are independent of μ_i (hence, there is only a cost-saving, but no strategic effect). The second point follows since $\gamma_P^{FB} > 0$. To show the third point, notice that

$$x_S^{FB} - x_P^{FB} = \frac{(a-c)(5\theta - 1 - 2\theta^2)}{2b(2-\theta)}.$$

Hence, $x_S^{FB} > x_P^{FB}$ if $\theta > \frac{5-\sqrt{17}}{4}$ and the same holds for the (gross) profits of the firms. $\square$

Using the result that $\pi_S^{FB} > \pi_P^{FB}$ for $\theta > \frac{5-\sqrt{17}}{4} \simeq 0.2192$, we can obtain insights on the comparison of the net profits of the two firms. It follows that a sufficient condition for $\pi_S^{BB} + \mu_S V_S^{BB} > (1+\mu_P)\pi_P^{BB}$ is that $\mu_S > \mu_P$ and $\theta > \frac{5-\sqrt{17}}{4}$. In other words, the SCF has to commit to a sufficiently high degree of social concern and attract a manager with a higher level of intrinsic motivation to make sure that its net profit is higher than the PMF's net profit.

3.4 Overall equilibrium

To derive the overall equilibrium of our game, we just have to compare the SCF's payoffs in subgames BB and FB. Assuming the same social strategy, i.e. the same degree of social concern, θ, in both subgames, we have

$$V_S^{FB} - V_S^{BB} =$$
$$= \frac{(a-c)^2(1-\theta)^2[2(1+\mu_S)(7+2\mu_S)\theta - 7(1+\mu_S)^2 - (3+4\mu_S)\theta^2]}{8b(2-\theta)((5-\theta)(1+\mu_S) - \theta\mu_S)^2}.$$

Therefore, the SCF strictly prefers a fixed wage compensation to strategic incentives if the bracketed term in the numerator of the ratio above is positive. Solving the quadratic equation shows that this is the case if

$$\theta > \theta^*(\mu_S) = \frac{7 + (9+2\mu_S)\mu_S - 2(1+\mu_S)\sqrt{7+\mu_S^2}}{3+4\mu_S}.$$

It can be also checked that $\pi_S^{FB} > \pi_S^{BB}$ if $\theta > \theta^*(\mu_S)$. Figure 1 depicts $\theta^*(\mu_S)$ for values of $\mu_S \in [0,1]$. Our analysis demonstrates two things. First, for a given level of intrinsic motivation of the manager the degree of social concern has to be sufficiently high. Second, for higher levels of intrinsic motivation, the threshold $\theta^*(\mu_S)$ increases. This shows that the two commitment devices – hiring an intrinsically motivated manager and pursuing a social strategy – are in this sense complementary and can substitute for strategic incentives via a bonus-based compensation contract. Our model predicts that, from a strategic point of view, if the SCF uses low-powered incentives like a fixed wage, then a sufficiently intrinsically motivated manager has to be combined with a strong emphasis on social concern to make the overall combination preferable.

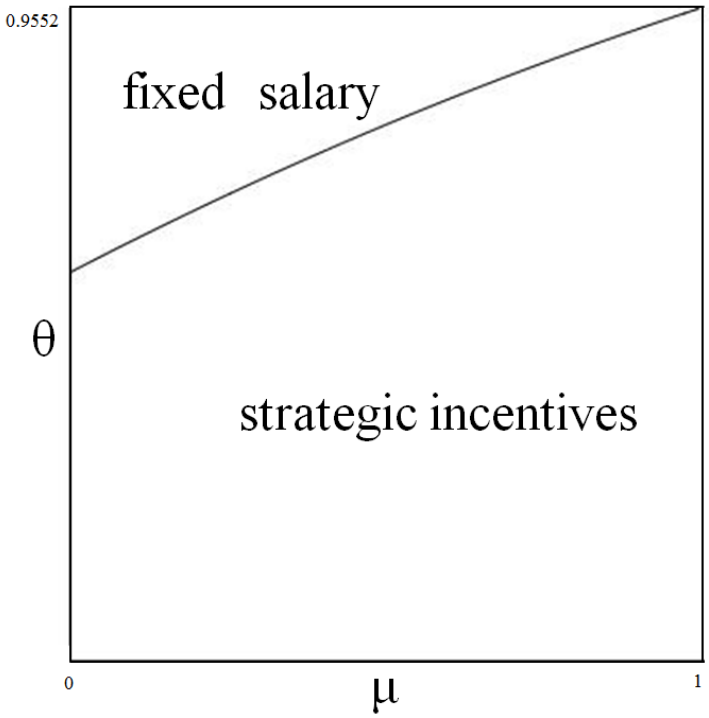

Figure 1: Optimal contract form depending on firm's social concern θ and manager's degree of intrinsic motivation μ_S.

So far we have assumed that the social strategy captured by the level of social concern, θ, is fixed. However, it can be argued that a social strategy should also serve the interest of profit-maximizing investors (Husted and Allen 2011, Starks 2009). This raises the question if the results of our equilibrium analysis still hold if in each subgame the value of θ capturing the SCF's social strategy is chosen to maximize the profit. Our analysis shows that in this case, the *unique* subgame-perfect outcome of the game is to use a fixed wage ($B_S = 1$) to compensate the manager *independent* of the manager's degree of intrinsic motivation μ_S. In mathematical terms, let θ^{BB} and θ^{FB} denote the unique levels of social concern in $(0, 1)$ which maximize the corresponding subgames' profits π_S^{BB} and π_S^{FB}.[17] Then we have $V_S^{FB}(\theta^{FB}) > V_S^{BB}(\theta^{BB})$ and also $\pi_S^{FB}(\theta^{FB}) > \pi_S^{BB}(\theta^{BB})$ for all values of μ_S. Consequently, if the owners implement the optimal social strategy θ^{FB} or θ^{BB} in correspondence with the manager's type and the manager's compensation, they would *unanimously* prefer to compensate the intrinsically motivated manager via a fixed wage.

[17] Although the expression of the corresponding solution of the first-order condition is quite complicated (and therefore not reported here), it can be easily shown that it is unique.

The overall solution of the game hence yields $\theta^{FB} \simeq 0.4786$ for the SCF's profit-maximizing level of social concern and for the quantities and payoffs we obtain

$$x_P^{FB}(\theta^{FB}) = 0.2607\frac{(a-c)}{b}, \qquad x_S^{FB}(\theta^{FB}) = 0.5680\frac{(a-c)}{b}$$

$$\pi_P^{FB}(\theta^{FB}) = 0.0447\,\frac{(a-c)^2}{b}, \qquad \pi_S^{FB}(\theta^{FB}) = 0.0973\,\frac{(a-c)^2}{b},$$

$$V_S^{FB}(\theta^{FB}) = 0.2616\frac{(a-c)^2}{b}.$$

Our findings are summarized in the next proposition.

Proposition 4:

1. If the owners endogenously select the profit-maximizing social strategy in correspondence with the managers' type and compensation, then the overall equilibrium of the game is given by the outcome of subgame FB.

2. The SCF hires an intrinsically motivated manager and compensates this manager by paying a fixed salary. The PMF hires an intrinsically motivated manager and uses strategic incentives.

3. The SCF achieves a higher profit than the PMF, $\pi_S^{FB}(\theta^{FB}) > \pi_B^{FB}(\theta^F)$.

Proof: Follows from the arguments provided in the text and by straightforward manipulation of equilibrium quantities and profits. □

4 Conclusion

In this paper we provide an explanation for low-powered incentives in socially responsible firms based on optimal combinations of commitment mechanisms. We introduce a mixed quantity-setting duopoly model with a profit-maximizing firm and a socially concerned firm where this optimal combination is determined by the firms' owners. Both firms can hire either a selfish or an intrinsically motivated manager. Furthermore, they can use strategic incentive contracts based on a firm's profit and sales revenue. We find that both firms always prefer to hire an intrinsically motivated manager, but for different reasons. We also find that in equilibrium, the profit-maximizing firm always prefers to use strategic incentives to make its manager more aggressive. In contrast, for the socially concerned firm it is advantageous - in terms of value and profit - to choose a profit-maximizing social strategy and to pay a straight salary to its intrinsically motivated manager.

Our modeling approach points to a further reason for the wide-spread use of low-powered incentives in socially concerned firms. It also shows that a firm can select an optimal fit of its social strategy, its managerial compensation system and the manager's type as a competitive strategy to increase its profit. In the case a firm implements an optimal social strategy, the SCF's commit to customer surplus effectively eliminates the necessity of a commitment through its incentive

contract. In summary, we show that a stakeholder orientation combined with an intrinsically motivated manager crowds out the efficiency of strategic incentives.

The analytical framework presented here is a first step to shed light on the differences in the compensation structure between different types of organizations - profit-maximizing and socially concerned - in an imperfectly competitive environment. There are a variety of interesting issues which are left open. For example, how do the results change if the interaction takes place in an oligopolistic market with more than two firms? Do these results hold if other forms of incentive contracts are considered? These and other interesting questions, for example, timing issues, the impact of other manager biases, or managers' price-setting behaviors and R&D investment decisions, are left open for future research.

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References

Akerlof, G.A. and R.E. Kranton (2000) Economics and Identity, Quarterly Journal of Economics 115(3), 715-753.

Akerlof, G.A. and R.E. Kranton (2005) Identity and the Economics of Organizations, Journal of Economic Perspectives 19(1), 9-32.

Ariely, D., A. Bracha, and S. Meier (2009) Doing Good or Doing Well? Image Motivation and Monetary Incentives in Behaving Prosocially, American Economic Review 99(1), 544-555.

Ballou, J.P. and B.A. Weisbrod (2003) Managerial Rewards and the Behavior of For-Profit, Governmental, and Nonprofit Organizations: Evidence From the Hospital Industry, Journal of Public Economics 87(9-10), 1895-1920.

Bandiera O., L. Guiso, A. Prat and R. Sadun (2011) Matching Firms, Managers, and Incentives, NBER Working paper No. 16691.

Barcena-Ruiz, J.C. (2009) The Decision to Hire Managers in Mixed Markets under Bertrand Competition, The Japanese Economic Review 60(3), 376-388.

Barros, F. (1995) Incentive Schemes as Strategic Variables: An Application to a Mixed Duopoly, International Journal of Industrial Organization 13(3), 373-386.

Basu, K. (1995) Stackelberg Equilibrium in Oligopoly: An Explanation Based on Managerial Incentives, Economics Letters 49(4), 459-464.

Becker, G.E. (2008) Is Corporate Altruism Viable in a Competitive Economy?, Huffington Post Business, accessed on Feb 12, 2013.

Bénabou, R. and J. Tirole (2003) Intrinsic and Extrinsic Motivation, Review of Economic Studies 70(3), 489-520.

Bénabou, R. and J. Tirole (2006) Incentives and Prosocial Behavior, American Economic Review 96(5), 1652-1678.

Berman, S.L., A.C. Wicks, S. Kotha, T.M. Jones (1999) Does Stakeholder Orientation Matter? The Relationship between Stakeholder Management Models and Firm Fianancial Performance, Academy of Management Journal 42(5), 488-506.

Berrone, P. and L.R. Gomez-Mejia (2009) The Pros and Cons of Rewarding Social Responsibility at the Top, Human Resource Management 48(6), 959-971.

Besley, T. and M. Ghatak (2005) Competition and Incentives with Motivated Agents, American Economic Review 95(3), 616-636.

Brekke, K.A. and K. Nyborg (2008) Attracting Responsible Employees: Green Production as Labor Market Screening, Resource and Energy Economics 30(4), 509-526.

Brand, B. and M. Grothe (2013a) A Note on 'Corporate Social Responsibility and Marketing Channel Coordination', Working Paper.

Brand, B. and M. Grothe (2013b) Social Responsibility in a Bilateral Monopoly, Working Paper.

Brekke, K.R., L. Siciliani, and O.R. Straume (2012) Quality Competition With Profit Constraints, Journal of Economic Behavior and Organization 84(2), 642-659.

Bromberger, A.R. (2011) A New Type of Hybrid, Stanford Social Innovation Review(Spring), 48-53.

Cai, Y., H. Jo, and C. Pan (2011) Vice or Virtue? The Impact of Corporate Social Responsibility on Executive Compensation, Journal of Business Ethics 104(2), 159-173.

Campbell, D. (2012) Employee Selection as a Control System, Journal of Accounting Research 50(4), 931-966.

Canton, E. (2005), Power of Incentives in Public Organizations When Employees Are Intrinsically Motivated, Journal of Institutional and Theoretical Economics 161(4), 664-680.

Chen, Y. and J. Jermias (2013) Business Strategy, Executive Compensation and Firm Performance, Accounting and Finance (forthcoming, doi:10.1111/j.1467-629X.2012.00498.x).

Cuevas-Rodríguez, G., L.R. Gomez-Mejia, and R.M. Wiseman (2012) Has Agency Theory Run Its Course?: Making the Theory more Flexible to Inform the Management of Reward Systems, Corporate Governance: An International Review 20(6), 526-546.

Cunat, V. and M. Guadalupe (2005) How Does Product Market Competition Shape Incentive Contracts?, Journal of the European Economic Association 3(5), 1058-1082.

Eccles, R.G., M.P. Krzus, J. Rogers and G. Serafeim (2012) The Need for Sector-Specific Materiality and Sustainablity Reporting Standards, Journal of Applied Corporate Finance 24(2), 65-71.

Ederer, F. and G. Manso (2013) Is Pay-for-Performance Detrimental to Innovation? Management Science (forthcoming, doi:10.1287/mnsc.1120.1683).

Ellingsen, T. and M. Johannesson (2007) Paying Respect, Journal of Economic Perspectives 21(4), 135-149.

Ellingsen, T. and M. Johannesson (2008) Pride and Prejudice: The Human Side of Incentive Theory, American Economic Review 98(3), 990-1008.

Englmaier, F. (2010) Managerial Optimism and Investment Choice, Managerial and Decision Economics, 31(4), 303-310.

Englmaier, F. and S. Leider (2012) Contractual and Organizational Structure with Reciprocal Agents, American Economic Journal: Microeconomics 4(2), 146-183.

Englmaier, F. and M. Reisinger (2013) Biased Managers as Strategic Commitment, Managerial and Decision Economics (forthcoming, doi:10.1002/mde.2619).

Fehr, E. and A. Falk (2002) Psychological Foundations of Incentives, European Economic Review, 46(4-5), 687-724.

Fershtman, C. (1985) Managerial Incentives as a Strategic Variable in Duopolistic Environment, International Journal of Industrial Organization 3(2), 245-253.

Fershtman, C. (1990) The Interdependence Between Ownership Status and Market Structure: The Case of Privatization, Economica 57(227), 319-328.

Fershtman C. and K. L. Judd (1987) Equilibrium Incentives in Oligopoly, American Economic Review 77(5), 927-940.

Fischer, P. and S. Huddart (2008) Optimal Contracting with Endogenous Social Norms, American Economic Review 98(4), 1459-1475.

Francois, P. (2007) Making a Difference, RAND Journal of Economics, 38(3), 714-732.

Francois, P. and M. Vlassaopoulos (2008) Pro-social Motivation and the Delivery of Social Services, CESifo Economic Studies, 54(1), 22-54.

Frey, B. S. (1997) Not Just for the Money - An Economic Theory of Personal Motivation, Edward Elgar Publishing Limited, Cheltenham.

Frye, M.B., E. Nelling, and E. Webb (2006) Executive Compensation in Socially Responsible Firms, Corporate Governance 14(5), 446-455.

Glassman, D. M. and K. Spahn (2012) Performance Measurement for Nonprofits, Journal of Applied Corporate Finance 24(2), 72-77.

Glazer, A. (2004) Motivating Devoted Workers, International Journal of Industrial Organization 22(3), 427-440.

Goering, G.E. (1996) Managerial Style and the Strategic Choice of Executive Incentives, Managerial and Decision Economics 17(1), 71-82.

Goering, G.E. (2007) The Strategic Use of Managerial Incentives in a Non-profit Firm Mixed Duopoly, Managerial and Decision Economics 28(2), 83-91.

Goering, G.E. (2012) Corporate Social Responsibility and Marketing Channel Coordination, Research in Economics 66(2), 142-148.

Grolleau, G., N. Mzoughi and S. Pekovic (2012) Green Not (Only) For Profit: An Empirical Examination of the Effect of Environmental-related Standards on Employees' Recruitment, Resource and Energy Economics 34(1), 74-92.

Heifetz, A., C. Shannon and Y. Spiegel (2007) What To Maximize If You Must, Journal of Economic Theory 133(1), 31-57.

Hermalin, B.E. and N.E. Wallace (2001) Firm Performance and Executive Compensation in the Savings and Loan Industry, Journal of Financial Economics 61(1), 139-170.

Husted, B.W. and D.B. Allen (2011) Corporate Social Strategy - Stakeholder Engagement and Competitive Advantage, Cambridge University Press, New York.

Jegers, M. (2009) Corporate Governance in Nonprofit Organizations - A Nontechnical Review of the Economic Literature, Nonprofit Management & Leadership 20(2), 143-164.

Jo, H. and M.A. Harjoto (2011) Corporate Governance and Firm Value: The Impact of Corporate Social Responsibility, Journal of Business Ethics 103(3), 351-383.

Karuna, C. (2007) Industry Product Market Competition and Managerial Incentives, Journal of Accounting and Economics 43(2-3), 275-297.

Kelsey, D. and F. Milne (2008) Imperfect Competition and Corporate Governance, Journal of Public Economic Theory 10(6), 1115-1141.

Königstein, M. and W. Müller (2001) Why Firms Should Care for Customers, Economics Letters 72(1), 47-52.

Kopel, M. and B. Brand (2012) Socially Responsible Firms and Endogenous Choice of Strategic Incentives, Economic Modeling 29(3), 982-989.

Kopel, M., and C. Löffler (2008) Commitment, First-mover, and Second-mover Advantage, Journal of Economics 94(2), 143-166.

Kopel, M. and C. Löffler (2012) Organizational Governance, Leadership, and the Influence of Competition, Journal of Institutional and Theoretical Economics 168(3), 362-392.

Kopel, M. and M. Marini (2012) Optimal Compensation Structure in Consumer Cooperatives under Mixed Oligopoly, Working Paper.

Kräkel, M. (2004) Managerial Versus Entrepreneurial Firms: The Benefits of Separating Ownership and Control, Schmalenbach Business Review 56(1), 2-19.

Lacetera, N. and L. Zirulia (2012) Individual Preferences, Organization, and Competition in a Model of R&D Incentive Provision, Journal of Economic Behavior and Organization, 84(2), 550-570.

Lambertini, L. and A. Tampieri (2010) Corporate Social Responsibility in a Mixed Oligopoly, Working Paper.

Larkin, I., L. Pierce, and F. Gino (2012) The Psychological Costs of Pay-for-Performance: Implications for the Strategic Compensation of Employees, Strategic Management Journal 33(10), 1194-1214.

Leete, L. (2000) Wage Equity and Employee Motivation in Nonprofit and Forprofit Organizations, Journal of Economic Behavior and Organizations 43(4), 423-446.

Lothe, S. and I. Myrtveit (2003) Compensation Systems for Green Strategy Implementation: Parametric and Non-Parametric Approaches, Business Strategy and the Environment 12(3), 191-203.

Makris, M. (2009) Incentives for Motivated Agents Under an Administrative Constraint, Journal of Economic Behavior and Organization 71(2), 428-440.

Matolcsy, Z. and A. Wright (2011) CEO Compensation Structure and Firm Performance, Accounting and Finance 51(3), 745-763.

Matsumura, T. (1998) Partial Privatization in Mixed Duopoly, Journal of Public Economics 70(3), 473-483.

Merzoni, G. (2000) Strategic Delegation in Cournot Oligopoly with Incomplete Information, in Baye, M.R. (ed.) Industrial Organization (Advances in Applied Microeconomics, Volume 9), Emerald Group Publishing Limited, 279-305.

McGuire J., S. Dow and K. Argheyd (2003) CEO Incentives and Corporate Social Performance, Journal of Business Ethics 45(4), 341-359.

Miles, P.C. and G. Miles (2013) Corporate Social Responsibility and Executive Compensation: Exploring the Link, Social Responsibility Journal 9(1), 76-90.

Milgrom, P. and J. Roberts (1995) Complementarities and Fit: Strategy, Structure, and Organizational Change in Manufacturing, Journal of Accounting and Economics 19(2-3), 179-208.

Miller, N. and A. Pazgal (2002) Relative Performance as a Strategic Commitment Mechanism, Managerial and Decision Economics 23(2), 51-68.

Minkler, L. (2004) Shirking and Motivations in Firms: Survey Evidence on Worker Attitudes, International Journal of Industrial Organization 22(6), 863-884.

Murdock, K. (2002) Intrinsic Motivation and Optimal Incentive Contracts, RAND Journal of Economics 33(4), 650-671.

Ntim, C.G. and T. Soobaroyen (2013) Corporate Governance and Performance in Socially Responsible Corporations: New Empirical Insights From a Neo-institutional Framework, Corporate Governance: An International Review (forthcoming, doi:10.1111/corg.12026).

Pepper, A. and J. Gore (2012) Behavioral Agency Theory: New Foundations for Theorizing About Executive Compensation, Journal of Management (forthcoming, doi:10.1177/0149206312461054).

Perego P. and F. Hartmann (2009) Aligning Performance Measurement Systems With Strategy: The Case of Environmental Strategy, Abacus 45(4), 397-428.

Porter, M.E. and M.R. Kramer (2011) Creating Shared Value, Harvard Business Review 89(1/2), 62-77.

Prendergast, C. (2008) Intrinsic Motivation and Incentives, American Economic Review: Papers & Proceedings 98(2), 201-205.

Roberts, J. (2004) The Modern Firm: Organizational Design for Performance and Growth, Oxford University Press.

Riyanto, Y.E. and L.A. Toolsema (2007), Corporate Social Responsibility in a Corporate Governance Framework, Working Paper.

Sampson, R. C. (2004) The Cost of Misaligned Governance in R&D Alliances, Journal of Law, Economics and Organization 20(2), 484-526.

Schaffer, M.E. (1989) Are Profit-Maximisers the Best Survivors? Journal of Economic Behavior and Organization 12(1), 29-45.

Sen, A. and S. Sikdar (1997) The Choice of Organizational Form in Strategic Contexts, Journal of Economic Behavior and Organization 32(4), 539-546.

Sengul, M., J. Gimeno and J. Dial (2012) Strategic Delegation: A Review, Theoretical Integration, and Research Agenda, Journal of Management 38(1), 375-414.

Sklivas, S.D. (1987) The Strategic Choice of Managerial Incentives, RAND Journal of Economics 18(3), 452-458.

Sliwka, D. (2007) Trust as a Signal of a Social Norm and the Hidden Costs of Incentive Schemes, American Economic Review 97(3), 999-1012.

Starks, L.T. (2009) Eastern Finance Association Keynote Speech: Corporate Governance and Corporate Social Responsibility: What Do Investors Care About? What Should Investors Care About?, The Financial Review 44(4), 461-468.

Tirole, J. (1994) The Internal Organization of Government, Oxford Economic Papers 46(1), 1-29.

Tirole, J. (2001) Corporate Governance, Econometrica 69(1), 1-35.

Tonin, M. and M. Vlassopoulos (2012) Social Incentives Matter: Evidence from an Online Real Effort Experiment, IZA Discussion Paper No. 6716, Institute for the Study of Labor, Bonn, Germany.

Van den Steen (2010) Culture Clash: The Costs and Benefits of Homogeneity, Management Science 56(10), 1718-1738.

Vickers, J. (1985) Delegation and the Theory of the Firm, Economic Journal 95(Supplement: Conference Papers), 138-147.

Vroom, G. and J. Gimeno (2007) Ownership Form, Managerial Incentives, and the Intensity of Rivalry, Academy of Management Journal 50(4), 901-922.

Webb, E. (2004) An Examination of Socially Responsible Firms' Board Structure, Journal of Management and Governance 8(3), 255-277.

White, M.D. (2001) Managerial Incentives and the Decision to Hire Managers in Markets with Public and Private Firms, European Journal of Political Economy 17(4), 877-896.

White, M.D. (2002) Political Manipulation of a Public Firm's Objective Function, Journal of Economic Behavior and Organization 49(4), 487-499.

Yanadori, Y. and J.H. Marler (2006) Compensation Strategy: Does Business Strategy Influence Compensation in High-Technology Firms? Strategic Management Journal 27(6), 559-570.

Yin, X. and E.J. Zajac (2004) The Strategy/Governance Structure Fit Relationship: Theory and Evidence in Franchising Arrangements, Strategic Management Journal 25(4), 365-383.