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Modelling the trade-off between profits and principles

by Johan J. Graafland*

Abstract

Corporations discover that social responsibility pays off. However, sometimes doing what is ethical will prove costly to a company. The purpose of this article is to clarify this trade-off by developing an economic model that describes the choice between profits and principles. The model is used to analyse how external factors like a change in consumer interests and competitiveness affect the relationship between profits and principles.

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1 Introduction

Corporate social responsibility is a trendy topic. Many companies are concerned about values like integrity and develop ethical codes to foster responsible behaviour of their employees (Kaptein et al, 1999). Firms find it increasingly important to behave like corporate citizens. Recent research shows that 78% of directors of medium sized Dutch companies agree that the company should contribute to solve social problems (van Luijck, 2000). Companies should not only create economic value, but also consider the ecological and social effects of their operations. They must meet the triple P bottom line expressing the expectations of stakeholders with respect to the company's contribution to profit, planet and people (Shell, 1999; SER, 2001).

There are several trends that explain the interest in corporate social responsibility.¹ First, the seventies have shown that there are limits to the controlling power of the government. Therefore, the government seeks ways to involve business by deregulating certain tasks (Jeurissen, 2000). Second, the globalisation of the world economy intensifies ethical problems related to cultural differences, for example with respect to the issue of human rights. Since we lack a strong international government, international companies trading in countries in which human rights are not protected have a special responsibility because of their power (Chryssides and Kaler, 1993). Third, new technologies confront firms with new ethical issues, like the privacy of users of Internet or the risks of new technologies like biogenetic food (Jeurissen, 2000; Vedder, 2001). A fourth reason is the environmental concern. Because pollution has no price, firms will tend to pollute more than is optimal from a social point of view. As the potential of the government to put a price on pollution by, for example, fines or other penalties is limited, there is a social need that companies take responsibility by themselves to develop production techniques that save the environment. A final reason is the increasing economic disparity worldwide. In the last two centuries the ratio between the average income per capita of the richest country (say Switzerland) and the poorest country (say Ethiopia) has increased from about 5:1 to 56:1.² Such large income disparities are probably not sustainable and may stimulate economic migration from South to North.

These trends create a vacant responsibility. It is, however, uncertain whether firms will respond positively to this challenge. The growing dynamics and resulting uncertainty in the economy caused by the globalization and the ICT revolution may shift the focus of firms from long-term strategies to short-term strategies. As a result, reputation may become less

¹ Besides corporate social responsibility, several other related terms have been developed, like corporate social responsiveness, corporate social policy process, corporate citizenship, corporate rectitude and community involvement. See Johan J. Verstraeten (1997).

² See Landes (1998) and UNDP (1996).

important and this may reduce the incentive to integrate social effects in the firm's policy. Also the increased competition and higher flexibility of financial capital may force firms to pay more attention to profitability at the costs of social goals like environment or employees rights. Hence, what makes us feel comfortable that business will take up the challenge posed by the trends mentioned above?

The first incentive comes from direct stakeholders who can punish the firm when its operations are not in line with the moral expectations of these stakeholders.³ The rise in welfare and in the skill level have made consumers more interested in the ethical aspects of products. Especially in those issues that have a direct impact on the consumer's stake, health issues etc. But also in broader ethical issues. Firms who do not meet the expectations of consumers have a higher probability of losing their reputation with a negative impact on market shares and profitability (McIntosh et al, 1998). This also impacts the stock market. Financial institutions or private persons will not invest their money in companies with actual or potential social and environmental liabilities, because they want to avoid the risk of owning a company that suddenly owes huge fines or faces drastic consumer boycotts (Daviss, 1999).⁴

The second incentive comes from an increasing impact of NGO's and the media, partly due to technological innovations that make the gathering of information much cheaper and the organisation of networks easier. If the media discovers that a company in some or another way misuses the trust given by society, it will be very difficult to maintain its reputation.

These incentives explain why ethics pays itself partly back. As people come to expect corporations to take a larger social role, companies will develop a social identity that is as important as brand identity. Indeed, if a company completely disregards ethics, the continuity of the company is highly uncertain in the long run (Velasquez, 1998). This changes the very nature of business and creates win-win situations. However, this is not the only way to interpret the relationship between profits and ethics. Sometimes doing what is ethical will prove costly to a company. Ethical behaviour is not always rewarded by a competitive advantage over companies that are not ethical. There may be decreasing returns to considering social goals. If so, what is an optimal policy for an individual firm? And how is this policy affected by such external changes as described above?

³ Mitchell et al (1997) distinguish between various types of stakeholders. They argue that the various classes of stakeholders might be identified upon the possession of the attributes power, legitimacy and urgency.

⁴ Hence, also the stock prices will be negatively affected if the reputation is damaged by unethical behaviour becoming known. For an empirical research confirming this effect, see Rao and Hamilton (1996).

In order to shed light on these questions, section 2 develops an economic model that describes the trade-off between profits and ethical principles. In our analysis, we reduce the triple P bottom line to two P's, profits and principles. The latter captures the two other P's of the triple P bottom line, planet and people.⁵ This model analyses the impact of consumer concerns, competition on the goods market and the intertemporal trade-off between short term profitability and long-term reputation on the ethical standards of the company. The trade-off is modelled by assuming imperfect competition on the output and the capital market.

In section 2 it is assumed that firms maximize profits. Following some studies in health economics⁶, section 3 introduces ethical principles as an explicit argument in the goal function of the company. In contrast to section 2, this allows solutions in which the profitability declines with a rise in principles.

In some cases, the model does not yield an optimal solution. Section 4 therefore further extends the model by introducing corner solutions by adding two external restrictions to the choice-set of the company. The first restriction represents the power of the government to force a minimum level of principles. The second restriction introduces a maximum level of principles by assuming a minimum level of profitability required to assure the financial continuity of the firm. Next, we analyse the impact of a decreasing power of the government and an increase in the competitiveness on the capital market on the trade-off between profits and principles.

The last section summarizes the main results and mentions some questions for future research.

2 Profit maximisation and principles

This section develops a partial equilibrium model that describes the trade off between profits and principles.

First, we describe the output market and production function of an individual firm and derive the optimal price set by the firm. It is assumed that the (representative) firm operates on a monopolistic competitive market. The production costs depend on the level of principles of the firm. Furthermore, the market share on the output market depends on the reputation of the firm. In particular, we introduce a state of a good reputation and a state of a bad reputation and assume that the

⁵ Of course, in reality the corporate social performance is a multidimensional variable which captures a wide variety of inputs. For example, Waddock and Graves (1997) use a weighted index consisting of five aspects of key stakeholder relations (community relations, employee relations, performance with respect to the environment, product characteristics and treatment of women and minorities) and three aspects related to external pressures.

⁶ For an overview, see McGuire (2000), pp. 521-22.

transition rates between these states depend on the level of principles of the firm. Since the price set by the firm generates no spillovers to the future, the firm selects an output price that maximizes short-term profits. The model is closed by assuming that the number of firms is so large, that the share of the representative firm is negligible. Hence, a change in the share of firms with a good reputation does not affect the behaviour of the individual firm.

Next, we introduce an intertemporal flow model and define the transition rates between the two reputation states. We investigate the impact of principles on long-term profitability and derive the so-called profit principle restriction that defines the choice set for the company.

Third, we model the optimal level of principles that maximizes long-term profits and investigate how firms reacts to external changes in the output market and production function. We compare the level of principles of firms with a good and a bad reputation and derive the share of firms with a good reputation in the (flow) equilibrium state.

Output market, production function and short-term profit

The firm is assumed to operate on a monopolistic competitive market with n heterogenous consumer goods. The demand for goods is derived from the utility function of a representative consumer, which is specified by the following CES-function:

$$(1) \quad u = \left\{ (\delta_g/n)^{1+\zeta} \sum_{k=1}^{k=n_g} (y_{g,k})^{-\zeta} + (\delta_b/n)^{1+\zeta} \sum_{k=n_g+1}^{k=n} (y_{b,k})^{-\zeta} \right\}^{-\zeta} \quad \delta_g \geq \delta_b$$

where u denotes utility, n the (exogenous) total number of (symmetric) firms (one firm supplying one good), n_g and n_b (equal to $n-n_g$) the number of firms with a good respectively bad reputation, k the index of an individual firm, δ_g and δ_b autonomous scale factors for firms with a good respectively bad reputation, y_g and y_b the consumer good of firms with a good respectively bad reputation and ζ a parameter reflecting the substitutability between different goods. Following Quinn (1998), we assume there are two situations: a state in which the firm has a good reputation (or quality) and a state in which the firm has a bad reputation.⁷ Besides for analytical convenience, this assumption also expresses the incidental character of a change in reputation. One serious infringement, like the use of child labour for the production of textiles or the sale of goods with defects that highly damage the health of

⁷ Alternatively, one can model reputation as a continuous variable analogues to the stock of health in the health economics literature. See, for example, Ried (1998).

consumers, can destroy the good reputation of a firm for a number of years. Goods with a good reputation are valued as least as high as goods with a bad reputation ($\delta_g \geq \delta_b$). Finally, it is noted that changes in the share of firms with a good reputation also changes the utility function of the consumer. Indeed, equation (1) can be interpreted as an actualisation of a more general potential utility function with n goods that can have both a good reputation and a bad reputation.

The demand for goods for an individual firm k can be derived as:

$$(2) \quad y_i = (\delta_i/n) (Y/py) (py_i / py)^{-\eta} \quad \eta > 1; i = g,b$$

where η (defined as $1/(1+\zeta)$) reflects the degree of competition, Y the (exogenous) total consumer demand for goods, py_i the price of the individual firm (with a good respectively bad reputation) and py the weighted CES price index defined as:

$$(3) \quad py = \left\{ (\delta_g/n) \sum_{k=1}^{k=n_g} (py_{g,k})^{(1-\eta)} + (\delta_b/n) \sum_{k=n_g+1}^{k=n} (py_{b,k})^{(1-\eta)} \right\}^{1/(1-\eta)}$$

Since it is assumed that n is very large, the impact of the price of the individual company on the weighted aggregate price is negligible. Therefore, although the share of firms with a good reputation respectively bad reputation can change in response to changes in the parameters (see below), this will not affect the demand curve for the individual firm.

The probability of a good reputation is related to the ethical standard of the firm (see below). Although firms with a low ethical standard can initially have a good reputation, they face a higher risk of losing this position and enter the state with a bad reputation. Firms can reduce this probability by raising the ethical standards, but then they incur some additional operation costs.

To describe production costs, we assume a simple linear production function. Besides the costs for direct input factors, the firm spends some operating costs to maintain some principles, for example, with respect to safety standards or audit activities. Profits in state i can therefore be defined as:

$$(4) \quad \pi_i = (py_i - c(d_i)) y_i \quad i = g,b ; \quad \partial c/\partial d > 0$$

where d denotes the level of ethical principles and c the production costs per unit product. It is assumed that the production costs depend positively on the level of principles.

Since the price set by the firm generates no reputation effect, in each state the firm sets the output price in such a way that it maximizes short-term profits. This gives the following standard mark-up pricing rule:

$$(5) \quad \max (\arg py_i) \pi_i = (py_i - c(d_i)) (\delta_i/n) (Y/py) (py_i / py)^{\eta-1} \quad \text{---->} py_i = \eta c(d_i) / (\eta-1)$$

Combining equations (2) and (4) - (5) gives the following reduced form equation for short-run profits:

$$(6) \quad \pi_i = \xi \delta_i (c(d_i))^{1-\eta} \quad , \quad \partial \pi_i / \partial d_i < 0$$

with $\xi = (Y/py)(1/n)(py/\eta)^\eta (\eta-1)^{\eta-1}$, which is independent of the reputation of the firm. Furthermore, note that profits are negatively related to the level of principles (see the appendix). This implies that the profit in a state of a good reputation does not necessarily exceed the profit in a state of a bad reputation. If the scale parameters δ_i do not significantly differ and the level of principles is higher in the case of a good reputation (see below), the production costs per unit product for firms with a good reputation are relatively high and π_g will be lower than π_b .

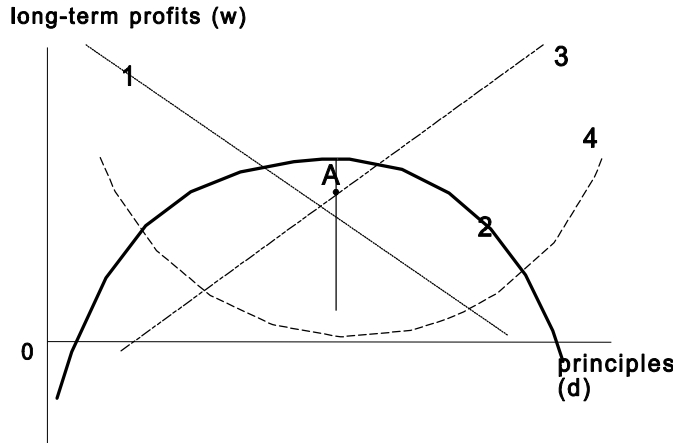
Long-term profits

The firm sets the level of principles to maximize its long-term profits (w). It can be shown from the dynamic programming approach (see e.g. Diamond (1982), Holmlund and Lindén (1993) and Pissarides (1990)) that in the steady state we have the following Bellman functions in the two states:

$$(7) \quad \rho w_g = \pi_g + f_g(d_g) (w_b - w_g) \quad f_g > 0; \partial f_g / \partial d_g < 0; \partial^2 f_g / \partial d_g^2 > 0$$

$$(8) \quad \rho w_b = \pi_b + f_b(d_b) (w_g - w_b) \quad f_b > 0; \partial f_b / \partial d_b > 0; \partial^2 f_b / \partial d_b^2 < 0$$

ρ denotes the rate of time preference. f_g is the probability of moving from a state of a good reputation to a state of a bad reputation. The probability to lose the good reputation depends negatively on the level of principles. However, the second order derivative of principles is assumed to be positive. That means: the marginal impact of the level of principles on the probability to lose the good reputation decreases with the level of principles. f_b denotes the probability of restoring its reputation. Bovenberg (2000) argues that firms that have lost their good reputation, will not be able to reenter a state of good reputation. However, if consumers have a relatively short memory, it will be easy for a firm to restore its reputation. For example, when the public found out that Ford had deliberately chosen for a dangerous position of the gas tank in the Ford Pinto causing the death of many motorists in the seventies, the American consumer was furious. Ford reacted by terminating the production of the Pinto. Fortunately for Ford this accident caused no permanent damage of its reputation (NRC, 2000). It is assumed that f_b depends positively on the level of



principles. The second order derivative is assumed to be negative: if the level of principles increases, the probability of restoring the reputation rises degressively.

The impact of principles on long-term profits

In order to investigate the impact of principles on long-term profits, we rewrite equation (7) and equation (8) as:

$$(9) \quad w_i = \{ \pi_i + f_i (\pi_j - \pi_i) / h \} / \rho \quad i=g,b; j=b,g$$

where $h = \rho + f_g + f_b$. From equation (9) the marginal impact of principles on long-term profits can be defined as:

$$(10) \quad \partial w_i / \partial d_i = \{ \partial \pi_i / \partial d_i + \partial f_i / \partial d_i (\pi_j - \pi_i) / h \} (1 - f_i / h) / \rho$$

Since $(1 - f_i / h) / \rho$ is unambiguously positive, the sign of $\partial w_i / \partial d_i$ depends on the term between braces, which is related to the negative impact of principles on short-term profits ($\partial \pi_i / \partial d_i$) and to the marginal impact of principles on the flow rates ($\partial f_i / \partial d_i$) multiplied by the profit differential in the two states ($\pi_j - \pi_i$) and divided by the sum of the transition rates and the rate of time preference (h). Since this profit differential can either be positive or negative, the sign of $\partial w_i / \partial d_i$ is ambiguous. As is shown in the appendix, the second-order effect of principles on long-term profits ($\partial^2 w_i / \partial d_i^2$) is also ambiguous.

Equation (9) is graphically illustrated by Figure 1. The vertical axes depicts the long-term profit (w_i), the horizontal axes the level of principles (d_i). The curve reflects the restriction on the choice of the company. Let us call this the profit-principle restriction curve, or more shortly, the PPR curve. The shape of the PPR curve can have several forms. First, if $\partial w_i / \partial d_i$ is unambiguously negative (which is, for example, the case if $\pi_g < \pi_b$), the PPR curve is negatively sloped as expressed, for example, by curve 1 in Figure 1. The PPR curve might also have a hump shape if $\partial w_i / \partial d_i$ is initially positive and only becomes negative if d exceeds a certain level, like in curve 2. Indeed, some empirical studies (like Posnikoff (1997) and Waddock and Graves (1997)) suggest that (long-term) profitability is positively related to the ethical

standard.⁸ Ethical aspects of firm behaviour for which this win-win relationship between profits and principles hold are, for example, integrity of employees and the prevention of corruption and bribery. Companies that invest in these working patterns, for example by developing ethical codes and auditing processes, raise the transparency of their organisation and reduce the probability of an incident that harms their reputation. However, the marginal profits from raising the ethical standing of the firm might decline with the ethical level of the firm and, at some turning point (A), become negative. This marks the borderline of the win-win area of the PPR curve. In point A, an additional increase in the level of principles results in a decline of w .

If $\partial w_i / \partial d_i$ is unambiguously positive, the PPR curve will be upward sloping (curve 3). Alternatively, if $\partial w_i / \partial d_i$ is initially negative but becomes positive at a certain level of d , the PPR curve will be U-shaped (curve 4). In both these latter cases, the solution of the maximization problem of the company is characterized by infinite profits and principles. This is highly unlikely, since empirical trends in world wide income distributional parameters and ecological indicators suggest a lack of social and ecological sustainability, indicating that the scope for such a win-win perspective is limited. Indeed, although we cannot rule out the opposite, it is likely that the negative impact of principles on short-term profits will rise with the level of principles, whereas the returns from a higher probability of a good reputation is likely to fall. Therefore, in the rest of the paper we abstract from these latter two possibilities.

Optimal level of principles

⁸ There are, however, several other studies that find a neutral or negative relationship between profits and principles. See McWilliams and Siegel (2001).

In this section we assume that the PPR curve can be characterized by a hump shape (curve 2), both for firms with a good reputation and for firms with a bad reputation.⁹ From equation (10) the first order condition for an optimal level of principles that maximizes long-term profits can be defined as:

$$(11) \quad \partial\pi_i/\partial d_i + (\partial f_i/\partial d_i) (\pi_j - \pi_i) / h = 0$$

Equation (11) expresses that the marginal reduction in short-term profits must balance the marginal returns from a reduction in the probability of being in a state of bad reputation. The total differentiation of equation (11) reads:

$$(12) \quad p_0 \cdot d_i = - \partial\pi_i/\partial d_i + p_1 (\pi_g - \pi_b) + p_2 \partial f_i/\partial d_i + p_3 \cdot h$$

with $p_0 = -\partial^2 w_i / \partial d_i^2 > 0$

$$p_1 = - \partial f_g / \partial d_g / h > 0 \quad \text{if } i=g; \quad p_1 = f_b / \partial d_b / h > 0 \quad \text{if } i=b$$

$$p_2 = (\pi_b - \pi_g) / h < 0 \quad \text{if } i=g; \quad p_2 = (\pi_g - \pi_b) / h > 0 \quad \text{if } i=b$$

$$p_3 = (\partial f_i / \partial d_i) (\pi_j - \pi_i) / h^2 < 0$$

The signs of p_0 , p_2 and p_3 are necessary conditions (although not sufficient conditions) for a hump shape of the PPR curve, whereas the sign of p_1 follows from the assumptions made in equations (7) and (8). From equation (12) it follows that the optimal level of principles is higher if:

- the marginal impact of principles on short-term profits ($\partial\pi_i/\partial d_i$) is less negative;
- the fall in profits after the loss of a good reputation ($\pi_g - \pi_b$) is higher;
- the marginal impact of principles on the transition rates to a state with a bad reputation respectively good reputation ($\partial f_i/\partial d_i$) is lower (for $i=g$) respectively higher (for $i=b$).
- the transition rates and rate of time preference are lower (h)

The marginal impact of principles on short-term profits is affected by the marginal impact of principles on production costs ($\partial c_i/\partial d_i$), the competitiveness on the goods market (η) and the autonomous market shares (δ_i). The latter two variables also affect the profit differential between the state of a good and bad reputation (for a derivation, see the appendix). Box 1 reports the influence of these underlying

⁹ For the case of curve 1, see section 4. Furthermore, note that the model includes the possibility that the shape of the PPR curve of a firm with a good reputation differs from the shape of the PPR curve of a firm with a bad reputation, because this shape depends on $\partial f_i/\partial d_i$ which can differ substantially for $i=g$ and $i=b$.

exogenous variables and the other exogenous variables that affect the optimal level of principles for both regimes (good and bad state). Below, we discuss these effects in more detail.

Box 1 Impact of exogenous variables on the optimal level of principles

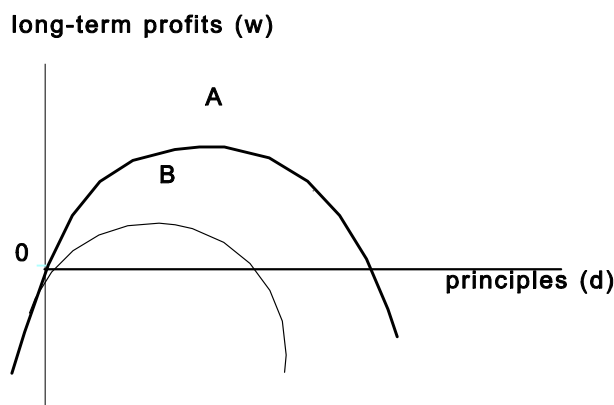
	$\partial c_g / \partial d_g$	$\partial c_b / \partial d_b$	η	$\delta_g - \delta_b$	$\partial f_g / \partial d_g$	$\partial f_b / \partial d_b$	f_g	f_b	ρ
d_g	-		-	?	-		-	-	-
d_b		-	-	+		+	-	-	-

The marginal impact of principles on production costs ($\partial c_i / \partial d_i$)

More and more managers become aware that if an organisation respects the individual employee, he will respond with a loyalty and a commitment to the organisation which will increase productivity (Wirtz, 1999). This reduces the marginal production costs of principles. If a corporate social responsibility policy that raises the social values within the firm will become less costly, the optimal level of principles will rise.

The competitiveness on the goods market (η)

Another factor that impacts the trade-off between profits and principles is the competitiveness on the goods market. An increase in the competitiveness on the goods market induces a fall in the level of principles, because it both raises the negative impact of principles on short-term profits and reduces the profit differential between a state of a good and a bad reputation.



profits will fall from A to B.

This shows that there is a trade-off between the (macro) economic

Figure 2 presents a graphical illustration of the effect of increasing competitiveness on the good market. Since profits fall and the negative marginal impact of principles on short-run profits increases, the PPR curve shifts downward and to the left. As a result, the optimal level of principles that maximizes long-term

advantages and the social and environmental disadvantages of more competition on the goods market. This puts restrictions on the traditional task of the government to stimulate competition between firms by an active antitrust policy and other kinds of market regulation that raise the transparency of the market and reduce transactions costs. Although a rise in the competitiveness will generally increase the consumer surplus by lowering the mark-up of prices over marginal cost, it may decrease the social and ecological efforts of the firm. If the latter effects dominate, the total welfare effect may be negative.

The fall in autonomous market share after the loss of a good reputation ($\delta_g - \delta_b$)

A third factor that affects the trade-off between profits and principles is the autonomous market share (δ_i). After the discovery of unethical aspects firms may be confronted with a consumer boycott of their products. The strength of the boycott depends on the attitude of consumers. If a lot of consumers are sensitive to the social effects of the operations of the firm, the discovery of the lapse may invoke a mass response of the public with dramatic consequences for the firm. If, on the other hand, only a small group of activist consumers are prepared to pay the price of boycotting the firm, the expected decline in profits upon discovery of ethical lapse will be small and firms will be tempted to choose a lower level of principles.

A change in the autonomous market share has two effects. First, it increases the negative marginal impact of principles on short-term profits. This effect tends to be relatively small, because the direct impact of δ_i on $\partial\pi_i/\partial d_i$ (see equation A(1) in the appendix) is partly balanced by the indirect impact of δ_i on $\partial\pi_i/\partial d_i$ through ξ by changing p_y in equation (3).¹⁰ Second, a change in δ_i will generally affect the difference in profits between the state of a good and a bad reputation if it shifts the relative magnitude of δ_b compared to δ_g (see equation A(3) in the appendix).

In the model, a rise in the sensitiveness of consumers to the ethical standards of the firm can be interpreted as a rise in $\delta_g - \delta_b$. Based on the first effect on the marginal impact of principles on short-term profits, this will generate relatively small effects on the level of principles in the two states. Based on the second effect on the profit differential between the state of a good and bad reputation, a rise in $\delta_g - \delta_b$ has an unambiguous positive impact on the level of principles in both states. If the second effect dominates, a higher preference of consumers for the social quality of the goods delivered by the company will increase the level of principles in both states.

The (marginal) transition rates ($\partial f_i/\partial d_i$ and f_i)

¹⁰ In the extreme case that n_g or n_b is zero, the net impact of δ_i on $\partial\pi_i/\partial d_i$ is zero.

The transition rates between a state of a good reputation and a state of a bad reputation (f_i) and the marginal impact of principles on these transition rates ($\partial f_i / \partial d_i$) will change if the influence of the NGOs and the role of the media increases, strengthening the transparency of the firm. A company's ethical lapse can now be flashed to news outlets and brokerage firms globally before a CEO can hurry back from lunch. This makes companies more cautious and more inclined to take care that their acts are in line with the expectations of the society.

An increase in the negative marginal impact of principles on the transition rates in the state of a good reputation ($-\partial f_g / \partial d_g$) or in the positive marginal impact of principles on the transition rate in the state of a bad reputation ($\partial f_b / \partial d_b$) raises the level of principles by enforcing the reputation effect and, hence, increasing the marginal returns from principles. The impact of the transition rate itself (f_i) is, however, negative, because it reduces the marginal impact of principles on the probability to be in a state with a bad (for $i=g$) respectively good reputation (for $i=b$). The impact of the transition rate in the other state (f_j) is also negative. For example, if f_b is relatively high because consumers have a short memory, it will be easy for a firm to restore its reputation anyway. For a firm in a state with a good reputation this makes it less attractive to reduce the probability of having a bad reputation by raising the level of principles.

The rate of time preference (ρ)

Another factor affecting the weight of future profits in long-term profits is the time of preference. If the rate of time preference increases, the firm will focus more on short-term profits whereas the weight of the change in future profits caused by a change in the reputation declines. In this respect, the growing dynamics of the economy as a result of, for example, the high speed of technological inventions, is worrying. It may induce a focus on short-term profits, because it is more difficult for economic agents to assess future developments in the market. Because of the high uncertainty, economic agents will be inclined to employ a higher rate of time preference. As a result of the associated shorter time horizons and increased 'short-term' thinking, the discounted benefits of maintaining a high reputation decline.

Difference in optimal level of principles in a state of a good and a bad reputation

Equation (11) can also be used to analyse in what direction the firm will adapt its level of principles if it changes from a state of a good reputation to a state of a bad reputation. For this purpose, we rewrite equation (11) by substituting equation (6). Dividing that for the good and bad state gives:

$$(13) \quad (c(d_g))^{-\eta} \partial c / \partial d_g / (c(d_b))^{-\eta} \partial c / \partial d_b = (- \partial f_g / \partial d_g / \partial f_b / \partial d_b) (\delta_b / \delta_g)$$

If it assumed that the marginal cost of principles rises with the level of principles (in particular, if $\partial^2 c_i / \partial d_i^2 > \eta (\partial c_i / \partial d_i)^2 / c_i$, see the appendix) , we can rewrite equation (13) as:

$$(14) \quad d_g / d_b = H((- \partial f_g / \partial d_g / \partial f_b / \partial d_b) (\delta_b / \delta_g))$$

where H symbolizes a function with $H' > 0$. Equation (14) implies three results. First, it shows that the relative level of principles in the state of a good reputation compared to a state of a bad reputation is independent of the difference in the profit levels of the two states, because the profit differential affects the expected future benefits of principles in the same way. Instead, and that is the second point, it does depend on the marginal impact of the principles on the transition rates. This implies that if the marginal impact of principles on the probability of regaining a good reputation is relatively high, the level of principles in a state of a bad reputation can be higher than in the state of a good reputation. Third, equation (14) shows that the relative level of principles is negatively related to the relative autonomous market share. Since the relative autonomous market share decreases the marginal impact of principles on profits, it exerts a negative impact on the relative level of principles.

Flow equilibrium

Once the optimal choices of firms in a state of a good respectively bad reputation are determined, we can derive the share of firms with a good reputation respectively bad reputation. In particular, in the flow equilibrium state the flow of firms from a state of a good reputation to a state of a bad reputation is equal to the flow of firms from a state of a bad reputation to a state of a good reputation, i.e.

$$(15) \quad f_g(d_g) n_g = f_b(d_b) (n - n_g)$$

where d_g (d_b) denotes the optimal level of principles of companies in a good (respectively bad) state, n_g the number of companies in a good state and n the total number of companies. Rewriting for the share of companies in a good state gives:

$$(16) \quad n_g / n = 1 / (f_g(d_g) / f_b(d_b) + 1)$$

Since it is assumed that both f_g and f_b are positive, the share of companies in a good state will always lie in between 0 and 1. Taking the total differentiation yields:

$$(17) \quad \dot{n}_g / n = -\chi(\partial f_g / \partial d_g) \dot{d}_g + \chi(f_g(d_g) / f_b(d_b)) (\partial f_b / \partial d_b) \dot{d}_b$$

with $\chi = 1 / [f_b(d_b)(f_g(d_g) / f_b(d_b) + 1)^2] > 0$. Equation (17) illustrates the evident finding that the share of firms operating in the state of a good reputation depends positively on the level of principles chosen by firms both in the state of a good reputation and in the state of a bad reputation.

Finally, it can easily be shown that the flow equilibrium state is stable, since:

$$(18) \quad \dot{n}_g = f_b n - (f_g + f_b) n_g$$

The root of equation (18) is negative, implying that the flow equilibrium state will restore after a temporary shock in n_g .

3 Intrinsic valuation of principles

In this section we also include ethical principles as an explicit argument in the goal function of the company and model the trade-off between this ethical concern against (long-term) profitability. Including ethical principles is interesting for two reasons. First, as argued by Van Luijk (2000), firms sometimes also intrinsically value principles. Treating principles as an explicit argument in the goal function therefore enables us to analyse the impact of this interest on the trade-off between profits and principles. Second, the introduction of principles as an goal variable also changes some of the findings in section 2. In particular, because of the intrinsic interest in principles, firms will chose some positive level of principles even if the profit in the state of a good reputation is lower than in a state of a bad reputation. As a result, some comparative statics change.

Unfortunately, the introducing of an intrinsic interest in principles considerably complicates the intertemporal analysis of section 2. The reasons for this complication is that the transition rates not only affect the long-term profits, but also the long-term level of principles (analogously defined as $(d_i + f_i (d_j - d_i)/h) / \rho$, see equation (9)). The optimal level of principles in the good state therefore becomes dependent on the optimal level of principles in the bad state (and vice versa). This generates unattractive mathematical expressions that do not allow easy analytical solutions. In order to simplify the presentation, we therefore use a static framework instead of a dynamic framework.

The static framework is similar to the dynamic framework derived in equation (9), but differs in two aspects. First, we introduce a utility function which relates utility (e) to both profits and principles. Second, like Quinn (1998), we assume that this level of principles impacts the probability of being in a state of a good reputation respectively bad reputation. This gives:

$$(13) \quad e = e(w, d) \quad \partial e / \partial w > 0 ; \partial^2 e / \partial w^2 < 0 ; \partial e / \partial d > 0 ; \partial^2 e / \partial d^2 < 0$$

$$(14) \quad w = \pi_g + g(d) (\pi_b - \pi_g) \quad 0 < g < 1 ; \partial g / \partial d < 0 ; \partial^2 g / \partial d^2 > 0$$

Note the similarity between equation (20) and equation (9). π_g and π_b are defined as in equation (6).

The first-order condition for maximum utility reads:

$$(15) \quad \partial w / \partial d + (\partial e / \partial d) / (\partial e / \partial w) = 0$$

Compared to equation (11), equation (21) adds the ratio between marginal utility of principles and the marginal utility of expected profits as additional variable. If the latter term is positive, the optimal level of principles will not maximize expected profits.

Combining equations (19) - (21), the total differentiation of equation (21) can be defined as:

$$(16) \quad p_0 \, d = p_1 \, g + p_2 \, \partial \pi_g / \partial d + p_3 \, \partial \pi_b / \partial d + p_4 \, (\pi_g - \pi_b) + p_5 \, \partial g / \partial d + p_6 \, \partial e / \partial w + \partial e / \partial d$$

with

$$p_0 = -(\partial e / \partial w) (\partial^2 w / \partial d^2) - \partial^2 e / \partial d^2$$

$$p_1 = -\partial e / \partial w (\partial \pi_g / \partial d - \partial \pi_b / \partial d)$$

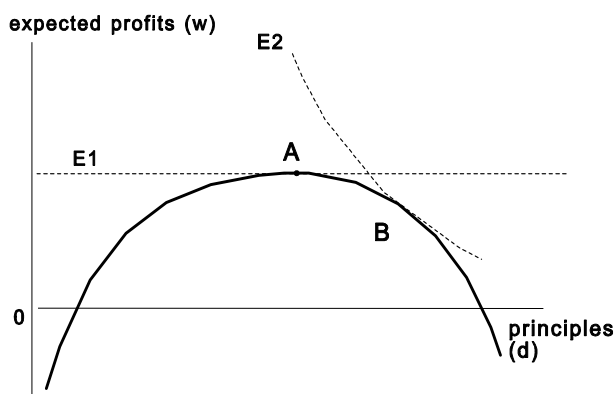
$$p_2 = (\partial e / \partial w) (1 - g) > 0$$

$$p_3 = (\partial e / \partial w) g > 0$$

$$p_4 = -(\partial e / \partial w) (\partial g / \partial d) > 0$$

$$p_5 = \partial e / \partial w (\pi_b - \pi_g)$$

$$p_6 = \partial w / \partial d$$



Equation (22) differs from equation (12) in three major aspects. First, it implies that the level of principles will rise if the firm attaches more intrinsic value to principles, i.e. if $\partial e / \partial d$ is higher. If the

public demand for corporate business responsibility rises, a concern with the business ethics will become part of an inevitable process of professionalization of managers (Chryssides and Kaler, 1993). A policy of corporate social responsibility is more credible if the managers of the firm intrinsically value principles (Graafland, 2001b). Firms will therefore be more inclined to appoint CEO's with a high intrinsic value of principles. Extrinsic motivations to raise the corporate social responsibility

may thus be internalised and turned into intrinsic motivations. This will raise the intrinsic value of principles in the utility function of the company. Graphically, the change in the intrinsic value of principles can be illustrated by Figure 3. A shift of the iso-utility curve from E1 (with no intrinsic value of principles) to E2 increases the optimal level of principles from point A to point B.

A second difference between equation (12) and equation (22) is that the second-order condition $p_0 > 0$ includes an additional term $-\partial^2 e / \partial d^2$. One of the consequences is that the hump shape of the PPR curve is not a necessary condition for a maximum anymore. Even if the PPR curve is unambiguously negatively sloped, an optimal solution can be obtained as long as $p_0 > 0$.

4 Other external restrictions

In some cases, the model presented in Sections 2 and 3 does not yield an optimal solution. In this section we extend the model by introducing two external restrictions to the choice-set of the company. First, we assume a minimum standard of principles that represents the power of the government to force a minimum level of principles. Next, we introduce a maximum level of principles by assuming a minimum level of profitability required to assure the financial continuity of the firm. We integrate these restrictions in the model and derive corner solutions. Next, we analyse the impact of changes in the minimum required levels of principles and profits on the trade-off between profits and principles.

Licence-to-operate restriction

If the second order condition for maximum utility does not hold (i.e. , if $(\partial e / \partial w)(\partial^2 w / \partial d^2) + \partial^2 e / \partial d^2 > 0$),¹¹ the utility of the company is maximized if principles are equal to minus infinite. In reality the set of profit-principle combinations for the company will be limited. In particular, several stakeholders may require a minimum level of principles. Statements in business reports indicate that this minimum value cannot be freely chosen by the firm.¹² Indeed, the government, may require that the company takes some minimum social responsibility in order to get a licence to operate. If the company does not meet this minimum standard, it will not obtain such a licence and profits will be zero. In some cases, this licence takes the form of a real licence. For example, Shell needs a licence from the Dutch government for its gas operations in the Dutch Waddenzee. In order to receive this licence, Shell must

¹¹ Or, in the case of section 2, if the PPR curve is unambiguously negatively sloped.

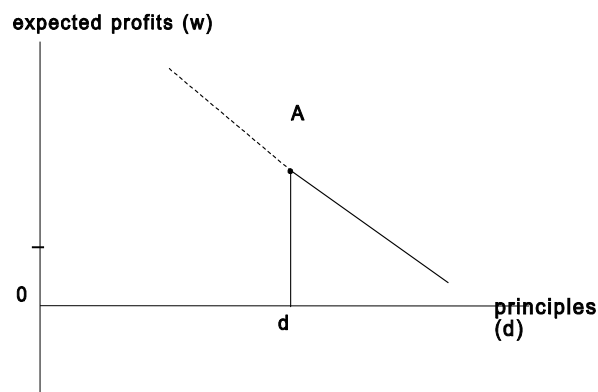
¹² Like, for example, in the Shell Report 1998 (page 18) 'To continue, it is essential to have endorsement from society - what some call a 'licence to operate'.

convince the politicians that its operations meet the environmental standard and that it will not harm the unique environment of the Waddenzee.

Ethical imperatives regarding the behaviour of individuals or organisations often enter economic analysis as constraints in the choice problem (Hurley, 2000). Figure 4 reflects the introduction of this licence-to-operate restriction. In this case, the intersection point A between the downward sloping PPR curve and the minimum level of principles required to obtain a licence to operate reflects the optimal choice of the company.

The minimum profit restriction

In some cases, companies may attach a high weight to principles. Indeed, companies like the ASN bank are well known for their high ethical standards and are intrinsically motivated to pursue these (Scott and Rothman, 1994). If $\partial e/\partial d / \partial e/\partial w$ is extremely large, the company may prefer a point with a very high level of principles and extremely low or negative level of profit. In such a case, the choice set of the company will be also limited. In particular, the capital market will demand that firms meet a certain minimum level of profitability. This happened, for example, with Consumer Unity Insurance Company. Founder Gibbons funded a local youth group in Washington D.C. and promised each of the children who joined that if they stayed drug-free, Consumer United would pay their way through college. Such largesse drew attention of insurance industry regulators. They were not convinced that

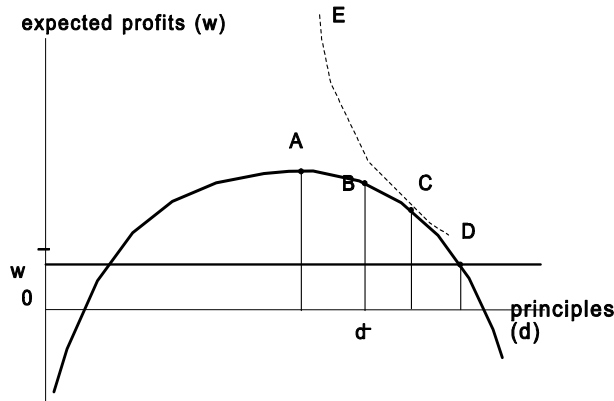


Gibbons' policy guaranteed enough future cash to pay claims and sought a court order declaring Consumers United insolvent. In 1993, the company was shut down (Daviss, 1999).

A general framework

Both the licence-to-operate restriction and the minimum profitability restriction limit the solution set of the company and give rise to corner solutions. Figure 5 provides an encompassing framework.¹³

¹³ Alternatively, these external restrictions can be interpreted as discontinuities in the PPR curve.



If the marginal impact of principles on expected profit is positive, any company will raise its principles up to the border of the win-win perspective in point A. There are three reasons why firms may choose a point further at the right than point A.¹⁴ First, the level of principles at point A may be insufficient to receive a licence to operate. Suppose, for example, that $d,-$ denotes

the minimum level of principles to attain such a licence. That means, only points at the right of point B belong to the part of the PPR curve that the firm can choose. If profit is the only goal of the firm, the firm will choose this corner solution. Second, if firms only strive at the maximization of principles, they will raise the level of principles to the point where the level of profitability is restricted by the minimum profitability ($w,-$) required to assure the financial continuity of the firm. In Figure 5 this is reflected by the corner solution point D. Third, if the company attaches an intrinsic value both to profits and to principles and is not limited by either the licence-to-operate restriction or the minimum profitability restriction, the optimal solution is at the point of tangency between the iso-utility curve and the PPR-curve in point C.

Taking the licence-to-operate restriction and the minimum profitability restriction into account requires a reformulation of the optimal level of principles by distinguishing three types of solutions:

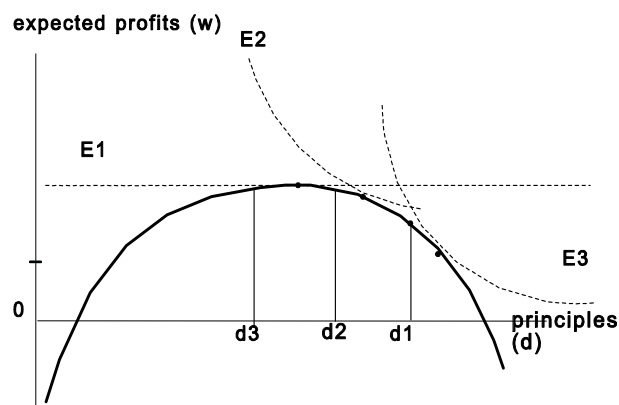
- (23a) $d = d^*$; $w = w^*$ if $d^* \geq d,-$ and $w^* \geq w,-$
- (23b) $d = d,-$; $w = w,\hat{}$ if $d^* < d,-$ and $w^* \geq w,-$
- (23c) $d = d,\hat{}$; $w = w,-$ if $d^* \geq d,-$ and $w^* < w,-$

where d^* and w^* denote the optimal level of principles respectively expected profits for the unrestricted firm derived in Section 3, $w,\hat{}$ the profit level if $d=d,-$ and $d,\hat{}$ the level of principles if $w=w,-$. $w,\hat{}$ and $d,\hat{}$ can both be derived from the profit-principles restriction equation (20) by substituting d respectively w by $d,-$ respectively $w,-$ and solving for w respectively d .

Change in the licence-to-operate restriction

¹⁴ For an illustration of these alternatives with statements from Shell reports, see Graafland (2001a, 2001c).

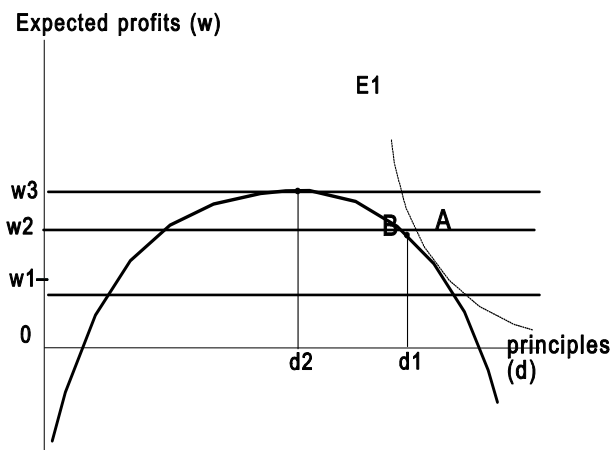
As described in the introduction, one of the causes of the increased interest in the social responsibility of firms is the diminished role of the government. The growing



dynamics in the economy because of the increasing speed of technological innovations reduce the effective power of the government to control the environmental and social effects of the production processes of corporations. Moreover, the internationalisation of the economy makes it easier for companies to allocate their activities to countries where government regulation is less stringent.

This trend may be interpreted as a reduction in the minimum level of principles required to receive a licence to operate. The way how firms respond to this change depends on the location of their iso-utility curve. This is illustrated by Figure 6. If the representative firm only strives to profit maximisation (E1) and the minimum required level of principles shifts from d_{-1} to d_{-2} , it will fully accommodate to the new lower minimum level of principles and chose the corner solution at the (new) minimum principle restriction. In case of a large shift from d_{-1} to d_{-3} the firm will deviate from the corner solution at the licence-to-operate restriction and prefer the level of principles that maximizes expected profits. At this point, a further reduction in the level of principles will decrease profits which is not in the interest of the firm. If the representative firm attaches an intrinsic value to principles (E2), it will find its optimal level of principles in between d_{-1} and d_{-2} and will not fully accommodate its level of principles to the new minimum. Whereas in the old situation the firm was forced to maintain the minimum level of principles set by external actors, this firm now voluntarily sets its principles higher than is minimally required in the new situation. That means: the firm becomes positively interested in corporate social responsibility. Not because the utility function of the firm changes, but rather because the point of tangency between the iso-utility curve and the PPR curve becomes relevant. If the representative firm has a high intrinsic value to principles (E3), it will not change its balance between profits and principles at all.

This analysis illustrates that the recent interest of companies in social responsibility is not necessarily good news from a social point of view. Indeed, insofar this interest is a response to the decreasing ability of the government to extort a certain level of principles, the rising interest of companies actually goes together with a reduction in the level of ethical standards itself. Hence, the causality between an increasing interest of companies in social responsibility and the social effects of these companies might be inverse. This may one of the explanations why,



for example,¹⁵ some empirical cross-section studies like Kohut and Corriher (1994) and Marnburg (2000) find no positive impact of the existence of ethical codes on the ethical standards of companies using these codes.¹⁶ Indeed, international companies operating in an environment with weak government controls might need ethical codes to protect themselves against too low levels of ethical standards, whereas

local firms subject to stringent government controls do not.

Change in the minimum profit restriction

Another implication of the increased globalization and transparency of the economy is an increased mobility of capital. This may also impact the balance between profits and principles. In particular, it might raise the minimum level of profitability required by the capital market. Firms with a relatively low expected profitability compared to their competitors will face more difficulties in attracting new capital to finance their investments and become an object for take over by more profitable firms if the capital market becomes more transparent and transaction costs decline.

The actual impact of changes in the minimum standard depends again on the location of the iso-utility curve of the representative firm (see Figure 7). If the representative firm attaches a relatively high intrinsic value to principles (as reflected by the iso-utility curve E1), a rise in the minimum required profitability from w_{-1} to w_{-2} will induce a shift from point A to B. As a result, the level of principles falls and the firm will shift from an unrestricted solution to a corner solution at the minimum profit restriction. If the minimum level of profitability will rise to w_{-3} , the company has no freedom at all to prefer a level of principles other than d_2 . Otherwise, it faces a risk that the financial basis of the company collapses.

Finally, we note that public corporations are more likely to be bound to the minimum profit restriction than closely held companies like family owned companies. As family companies are not directly subject to the market forces on the capital market, their minimum required profitability will generally be lower than that of public

¹⁵ For other explanations, see, for example, Kaptein and Wempe (1998).

¹⁶ It should be noted, however, that some other studies do find a positive relationship between codes of ethics and perceptions of ethical behaviour. See, for example, J.S. Adams et. al. (2001) and Vardi (2001).

corporations. Hence, there is more freedom for family owned firms to live up with their principles. This illustrates that there are several ethical aspects of turning a family company into a public corporation.

5 Summary and future research

The retreat of the government, the globalization and growing dynamics of the economy create a vacant responsibility for firms to consider the social and environment effects of their operations. Other trends, like a higher environmental and social concern of consumers and an increased role of NGOs and the media, create an incentive for firms to fill this vacant responsibility. This paper analyses how these trends affect the firms' choice between profits and principles.

For this purpose, section two develops a partial equilibrium model that describes the trade-off between short-term profits and long-term reputation effects. If the relationship between profits and principles is characterized by a hump shape, we can derive that the optimal balance between profits and principles shifts in favour of principles if the marginal impact of principles on the transition rate between a state of a good and bad reputation is higher; if the transition rates are lower; if the rate of time preference is lower; if the impact of principles on short-term profits is less negative; if the loss in profits after losing a good reputation is higher; or if the competitiveness on the goods market is weaker. The last finding suggests that there might also be negative welfare effects to an active antitrust policy of the government. Furthermore, we find that firms with a bad reputation may chose for a higher level of principles than firms with a good reputation if the marginal impact of principles on the probability of regaining a good reputation is relatively high.

Next, we assume that the firm can also attach an intrinsic value to principles. It is shown that a rise in the intrinsic value of principles increases the level of principles. Another interesting result is that the hump shape of the relationship between profits and principles is not a necessary condition for a maximum anymore because of the intrinsic value attached to principles.

Finally, in some cases the model does not yield an optimal solution, because the second order condition is not met. Indeed, if principles only create additional costs without generating any benefits, some firms may find it optimal to chose an infinitely low level of principles which will not be accepted by the society. For this reason, the model is extended by two external restrictions introducing discontinuities in the trade-off between profits and principles by assuming that the firm must meet some minimum levels for both profits and principles. It is shown that firms may react in a different way to changes in these external restrictions. For example, a reduction in the level of principles minimally required to obtain a licence to operate will be fully accommodated by a firm that only strives at profit maximisation, whereas firms

attaching an intrinsic value to both profits and principles may only partially adapt their level of principles. This analysis shows that the increased interest of companies in corporate social responsibility is not necessarily good news if it is provoked by a reduction in the ethical standards as a result of a weakening of government control.

The model leaves open some questions which should be dealt with in future research. For example, in the model the competitiveness on the goods market and the loss in market shares due to a loss of reputation are described by two independent parameters. However, in reality one would expect these parameters to be related. If different goods are highly substitutable, competitiveness will be strong, but so will be the consumer reactions to incidents showing unethical behaviour of the firm. If substitution is relatively easy because goods are highly homogenous and have an almost equal price (like, for example, in the case of petrol), punishing unethical behaviour of a particular firm by a consumer boycott is relatively cheap for consumers. Another interesting extension of the model is to endogenize the capital market operations of the firm by assuming a more continuous relationship between the profitability and the ability to attract financial means from the capital market and by taking into account that the ethical standard also affects this relationship. A final idea for future research is to consider principal agent problems. Managers may have their own preferences, which differ from those of the principals.

Appendix First and second-order effects of principles on profits

Principles and short-term profits

The marginal impact of principles on short-term profits equals:

$$(A1) \quad \partial\pi_i/\partial d_i = (1-\eta) \xi \delta_i c(d_i)^{-\eta} \partial c(d_i)/\partial d_i < 0$$

which depends negatively on the degree of competition (η), the autonomous market share (δ) and the marginal impact of principles on the cost per unit product $\partial c(d_i)/\partial d_i$.

The second-order impact of principles on short-term profits is equal to:

$$(A2) \quad \partial^2\pi_i/\partial d_i^2 = -\eta(1-\eta) \xi \delta_i c(d_i)^{-\eta-1} (\partial c(d_i)/\partial d_i)^2 + (1-\eta) \xi \delta_i c(d_i)^{-\eta} \partial^2 c(d_i)/\partial d_i^2$$

which is negative if $\partial^2 c_i/\partial d_i^2 > \eta (\partial c_i/\partial d_i)^2/c_i$. The difference in profit between a state of a good and a bad reputation is equal to:

$$(A3) \quad \pi_g - \pi_b = \xi c(d_g)^{-\eta} \{\delta_g - \delta_b (c(d_b)/c(d_g))^{-\eta}\}$$

If $d_g > d_b$, the profit differential is positive if $\delta_g / \delta_b > (c(d_g)/c(d_b))^{1/\eta}$ and depends positively on δ_g and negatively on δ_b . If the profit differential is positive, it depends negatively on η .

Principles and long-term profits

The second-order effect of principles on long-term profits equals:

$$(A4) \quad \partial^2 w_i / \partial d_i^2 = (1 - f_i/h) \{ \partial^2 \pi_i / \partial d_i^2 + (\partial^2 f_i / \partial d_i^2 - 2(\partial f_i / \partial d_i)^2 / h) (\pi_j - \pi_i) / h - 2 (\partial f_i / \partial d_i) (\partial \pi_i / \partial d_i) / h \}$$

As is shown by Box 2, the sign of $\partial^2 w_i / \partial d_i^2$ is ambiguous. For example, if the short-term costs rise degressive (progressively) with principles, the first term will be positive (negative). Similarly, if the profits in a state of a bad reputation exceeds the profits in a state of a good reputation, the second term might also be positive.

Box 2 Second order effects of principles on long-term profits

Reputation	$\partial^2 \pi_i / \partial d_i^2$	$\partial^2 f_i / \partial d_i^2 - 2(\partial f_i / \partial d_i)^2 / h$	$(\pi_j - \pi_i)$	$-2(\partial f_i / \partial d_i) \partial \pi_i / \partial d_i / h$
good	?	?	?	–

bad	?	–	?	+
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