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Corporate Culture Choices in Bertrand Competition: Customer Orientation versus Corporate Social Responsibility

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ABSTRACT:- This paper examines firms' endogenous choice between customer orientation (CO) and corporate social responsibility (CSR) in a Bertrand duopoly with differentiated products. In the first stage, each firm simultaneously and independently selects the optimal level of its corporate culture, specifically regarding CO and CSR; in the second stage, each firm simultaneously and independently sets its price to maximize its objective function. Using subgame-perfect equilibrium, we compare profits under CO, which values the surplus of a firm's own customers, and CSR, which values aggregate consumer surplus. We show that firms earn the same equilibrium profits for all feasible corporate culture levels. This result differs sharply from the corresponding Cournot result, in which firms prefer CO, and highlights how the mode of competition shapes corporate culture choices.

Keywords: Bertrand model; Customer orientation; Corporate social responsibility; Differentiated products; Subgame perfection

I. INTRODUCTION

A growing body of research has examined corporate social responsibility (CSR) and other stakeholder-oriented objectives in oligopolistic markets. Early contributions by Baron (2001, 2008) established theoretical foundations for CSR by analyzing the interaction between private politics, corporate strategy, managerial incentives, and socially responsible behavior. Besley and Ghatak (2007) further investigated the provision of public goods through CSR activities, emphasizing the role of firms as suppliers of social value beyond profit maximization.

Subsequent studies have incorporated CSR into various models of imperfect competition. Goering (2007, 2008) analyzed socially concerned firms in mixed duopoly settings and durable-goods markets. Kopel and Brand (2012) examined the endogenous choice of managerial incentives by socially responsible firms, while Kopel et al. (2014) studied evolutionary competition in markets containing socially concerned firms. Kopel (2015) compared price and quantity contracts in a mixed duopoly with a socially concerned firm. Other extensions include strategic privatization (Ouattara, 2017; Han, 2019), endogenous timing decisions (García et al., 2019), vertical product differentiation (Wang and Wang, 2022), and hospital competition involving both price and quality choices (Xu, 2014).

Another strand of the literature has explored CSR in environments characterized by network effects and market interactions. Fanti and Buccella (2016, 2018) investigated the relationship between network externalities and CSR, showing how CSR may affect firms' profitability and market performance in network industries. Lambertini and Tampieri (2012) analyzed the implications of CSR for collusion, demonstrating that socially responsible objectives can influence firms' ability to sustain cooperative behavior.

Several studies have also examined strategic commitments by socially concerned firms. Ohnishi (2021,

2022, 2023) investigated the strategic implications of lifetime employment and wage-related commitments in oligopolies involving socially concerned firms. These studies demonstrated that lifetime employment and wage-related commitments can significantly affect firms' strategic behavior and market outcomes when firms care for consumer welfare in addition to profits.

Related to CSR, another growing literature analyzes customer orientation (CO), under which firms care specifically for the surplus of their own customers rather than that of all consumers. Königstein and Müller (2001) first introduced this idea and showed that customer-oriented behavior can emerge as a rational business strategy.

A key distinction between CO and CSR was emphasized by Planer-Friedrich and Sahm (2018), who asked whether firms should care for all consumers (CSR) rather than only their own customers (CO). They demonstrated that CSR can arise endogenously and may be strategically preferable under certain market conditions. Ohnishi (2024) extended their analysis to markets with complementary goods. Planer-Friedrich and Sahm (2020) further showed that strategic CSR affects market concentration and competitive outcomes. Ohnishi (2026b) extends Planer-Friedrich and Sahm (2018) by analyzing a Bertrand duopoly with differentiated products and demonstrates that neither CSR nor CO increases profits under price competition. This result contrasts with Planer-Friedrich and Sahm (2018), where CSR may enhance profitability under quantity competition.

The analysis conducted by Ohnishi (2026a) compared CO and CSR strategies in a symmetric Cournot duopoly and found that firms endogenously choose customer orientation over social responsibility, suggesting that quantity-setting firms place greater weight on the welfare of their own customers than on that of all consumers. The present paper addresses this issue by extending Ohnishi (2026a) to a Bertrand duopoly with differentiated products. The timing of the game is as follows. In the first stage, each firm simultaneously and independently selects the optimal level of its corporate culture, specifically regarding CO and CSR. In the second stage, each firm simultaneously and independently sets its price to maximize its objective function. Subgame perfection is adopted as the equilibrium concept. We find that our result differs sharply from the Cournot outcome in Ohnishi (2026a).

The remainder of this paper proceeds as follows. In Section II, we describe the model. Section III characterizes the model's equilibrium. Finally, Section IV concludes the paper.

II. MODEL

We consider a duopoly consisting of two firms, firms 1 and 2, that produce differentiated products. Throughout the paper, subscripts 1 and 2 refer to firms 1 and 2, respectively. When i and j are used as firm indices, $i, j \in \{1, 2\}$ and $i \neq j$. Entry and exit are not possible. The inverse demand function is given by $p_i = 1 - q_i - \lambda q_j$, where $p_i \in [0, \infty)$ denotes the price of product i, $q_i \in [0, \infty)$ and $q_j \in [0, \infty)$ denote the outputs of firm i and firm j, respectively, and λ measures the degree of product differentiation. We assume that firms compete by setting prices, and accordingly, the demand function faced by firm i is $q_i = \frac{1}{1+\lambda} - \frac{1}{1-\lambda^2} p_i + \frac{\lambda}{1-\lambda^2} p_j$. We assume that $\lambda = 0.5$ for the sake of simplicity. The firms are assumed to have identical production technologies. Firm i's profit function is given by

$$\pi_i(p_i, p_j) = \left(p_i - m_i(q_i(p_i, p_j)) \right) q_i(p_i, \quad (1)$$

where $m_i = \frac{1}{2} q_i^2$ denotes the marginal cost of production.

We examine whether firms prefer CO or CSR. Under CO, firm i places weight on the surplus enjoyed by its own customers, denoted by C_i (see, e.g., Königstein and Müller, 2001; Planer-Friedrich and Sahm, 2018; Ohnishi, 2026b), where

$$C_i(p_i, p_j) = \frac{1}{2}\left[q_i(p_i, p_j)\right]^2$$

Under CSR, firm i places weight on aggregate consumer surplus, denoted by *CS* (see, e.g., Goering, 2007; Kopel and Brand, 2012; Kopel et al., 2014; Planer-Friedrich and Sahm, 2018; Ohnishi, 2026b), where

$$CS(p_i, p_j) = \frac{1}{2}\left[q_i(p_i, p_j) + q_j(p_j, p_i)\right]^2$$

Accordingly, firm i's objective function is given by

$$V_i(p_i, p_j) = \pi_i(p_i, p_j) + \theta\left[C_i(p_i, p_j) - \pi_i(p_i, p_j)\right] + (1-\theta)CS(p_i, p_j) \tag{2}$$

where $\theta \in [0,1]$ denotes the level of the firm's corporate culture.

We consider a two-stage game. In the first stage, each firm simultaneously and independently chooses its corporate culture level. In the second stage, each firm simultaneously and independently sets its price to maximize its objective function. Subgame perfection is adopted as the equilibrium concept. The next section derives the model's equilibrium.

III. EQUILIBRIUM

We solve the game using backward induction to derive the subgame-perfect equilibrium. In the second stage, firm *i* selects its price to maximize its objective function (2), given the rival's price. The first-order condition yields firm *i*'s best response:

$$p_i(p_j) = \frac{1 + (3 - 2\theta_i)p_j}{6 - 2\theta_i} \tag{3}$$

Substituting each reaction function into the other yields the equilibrium prices:

$$p_i = \frac{\left(9 - 2\left(\theta_i + \theta_j\right)\right)}{3\left(9 - 2\left(\theta_i + \theta_j\right)\right)} = \frac{1}{3}. \tag{4}$$

The resulting equilibrium quantity and profit are obtained as $q_i = \frac{4}{9}$ and $\pi_i = \frac{4}{81}$, respectively.

The equilibrium outcome of this model can be summarized as follows:

PROPOSITION 1: Each firm earns the same equilibrium profit under CO and CSR for all feasible values of θ.

Proposition 1 indicates that a firm's equilibrium profit is invariant to its corporate culture level. In particular, every feasible corporate culture level—including zero, which corresponds to CSR maximization, and one, which corresponds to CO maximization—yields the same equilibrium profit. Although the corporate culture level affects the firm's objective, it does not affect the profit the firm ultimately earns. Consequently, firms are indifferent among all feasible corporate culture levels in terms of equilibrium profitability.

IV. CONCLUSION

This paper has examined firms' endogenous choice between customer orientation (CO) and corporate social responsibility (CSR) in a Bertrand duopoly with differentiated products. In the first stage, each firm simultaneously chooses the optimal level of its corporate culture; in the second stage, the firms compete in prices. Solving the game by backward induction, we have shown that each firm earns the same equilibrium profit whether it adopts CO, which values the surplus of its own customers, or CSR, which values aggregate consumer surplus. Thus, firms are indifferent between the two corporate cultures in this price-setting environment.

This result differs sharply from the corresponding Cournot outcome, in which firms prefer CO to CSR. The comparison indicates that the strategic implications of corporate culture choices depend critically on the mode of market competition. In particular, changing the strategic variable from quantity to price can eliminate the profit advantage associated with favoring the welfare of a firm's own customers over that of all consumers. The analysis therefore contributes to the literature on endogenous corporate objectives by identifying market conduct as an important determinant of corporate culture choices.

Several extensions remain for future research. It would be useful to examine asymmetric costs or demand, alternative degrees of product differentiation, more than two firms, and endogenous entry.

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