

善因行銷策略效果之分析：以雙占零售 商為例

Analysis of Cause-Related Marketing Effects: The Case of Duopoly Retailing Store

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摘要：有越來越多的零售通路商希望能藉由善因行銷策略來刺激產品銷售。然而，過去研究中對善因行銷策略效果的結論相當分歧。為瞭解善因行銷之策略效果是否因捐贈基礎之不同而有差異，本文應用 Salop's 圓形區位模型(circle market model) 以二階段賽局來分析零售商間的競爭行為。再者，為探討善因行銷能否扭轉「零售品牌」競爭情勢，進一步針對統一與全家超商進行實證分析，以比較消費者對非交易型善因行銷 (NTCRM) 與交易型善因行銷 (TCRM) 兩種策略之評價以及策略效果之異同。本文之研究結果發現：(1) 不論是 NTCRM 或是 TCRM 策略，均可擴大產品差異化，使零售商得以提高其產品售價，形成與對手零售商之價差。(2) NTCRM 與 TCRM 的策略效果不盡相同，其中，消費者對於企業執行 NTCRM 策略有較高的評價。(3) 其他情況不變下，從事 NTCRM 之零售商，可因此增加銷售量，並降低對手零售商之銷售量及利潤。若不斷提高其捐贈金額，將使消費者轉向購買該企業產品的意願更為強烈，且不會造成前述效果之反轉。(4) 其他情況不變下，當零售商 TCRM 策略的單位捐贈，尚未達到最適單位捐贈金額時，TCRM 將可提高其銷售量，降低對手零售商之銷售量，並達到利潤移轉之效果。(5) 企業

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提高 TCRM 的單位捐贈金額，不必然可以增加消費者購買該企業產品之意願，其他情況不變下，當零售商 TCRM 的單位捐贈，超過了最適單位捐贈金額時，若繼續提高單位捐贈，則即使產品因 TCRM 而售價上漲之幅度小於單位捐贈之增幅，消費者購買 TCRM 產品之意願仍將減弱，寧願轉向購買沒有 TCRM 的較低價產品，形成反向的利潤移轉效果。

關鍵詞：善因行銷；雙占；非營利組織；圖形區位模型

Abstract: More recently, many retailing stores employ cause-related marketing strategy to enhance their sales. However, previous studies on the effects of cause-related marketing strategy remain rather inconclusive. This paper analyzes the impacts of cause-related marketing strategies by using Salop's Circle Model and two-stage game to analyze the competition between two main retailing stores, namely, 7-11 and Family Mart. With two types of cause-related marketing activities (i.e., transaction-based support cause-related marketing; TCRM and Non-transaction-based support cause-related marketing; NTCRM), the proposed model found that: (1) both NTCRM and TCRM strategies implemented by the retailing store could make product distinctly different from its opponent and result in a higher retailing price. (2) The effects of TCRM and NTCRM are different: consumers have tendency to accept the NTCRM activity. (3) All other things being equal, the retailing store who implements the NTCRM strategy could increase its sales and reduce the competitor's sales and profits. If the retailing store continues to increase its charitable or environmental-conscious donation, consumers' purchase intention would even be stronger. (4) The retailing store who implements the TCRM strategy with the donation amount per sales below the optimal level could increase its sales and as a result reduce the sale of its opponent, *ceteris paribus*. In addition, the profit-shifting effect has been identified. (5) If the retailing store increases its donation amount per sales, the purchase intention of consumers remains ambiguous. When the donation amount per sales is greater than the optimal level, it could decrease its sales and profit and increase the sales and profit of its opponent. In other words, the reverse effect exists.

Keywords: Cause-related marketing; Duopoly; Non-Profit Organizations; Circle market model

1. Introduction

Since the mid of 1980s, cause-related marketing (CRM) and its related issues have been received wide attentions (Barone *et al.*, 2000; Business in the Community, 2004; Cui *et al.*, 2003; Ellen *et al.*, 2000; Endacott, 2004; Hamlin and Wilson, 2004; Ross III *et al.*, 1992; Varadarajan and Menon, 1988; Webb and Mohr, 1998). By using cause-related marketing tool companies could connect their brand name with the Non-Profit Organizations (NPOs) constituting a win-win strategy for both parties (Varadarajan and Menon, 1988; Nan and Heo, 2007; Trimble and Rifon, 2006). In accordance with the definition of cause related marketing, previous studies have defined it from views of corporation aspect, nonprofit aspect, and consumer aspect, etc. For example, Keller(2008) suggested that in terms of corporation aspect, CRM is a permanent strategy that corporations could use to promote their brand image and to increase their profit. On the other hand, NPOs could use the donation from corporation to implement the cause activities and tasks. From the aspect of consumers, CRM could increase consumers' trust on the company (Yechiam *et al.*, 2003; Lafferty *et al.*, 2004) and in turn on the purchase intention (Berger *et al.*, 1999; Chaney and Dolli, 2001; Hajjat, 2003).

The famous example of CRM is the American Express donated the Statue of Liberty-Ellis Island Foundation in 1983 (Barnes and Fitzgibbons, 1991; Barone *et al.*, 2000; Hamlin and Wilson, 2004; Webb and Mohr, 1998). In 1982, American Express announced that they would donate one dollar per new card issued to the Liberty-Ellis Island Foundation. Moreover, every time a credit card was used, American Express donated one penny for the rebuild of Statue of Liberty. This resulted the use of American Express credit card to increase by 28% compared with the previous season and not surprisingly, the number of new cards issued increased by 45% (Varadarajan and Menon, 1988). Recently, in Taiwan, there are some companies that use CRM strategies to improve their brand image. For example, in 2010, Family Mart convenience store promoted the 'Paper Windmill' event to sponsor Children's Art work in Taiwan. As consumers buy goods marked 'paper windmill', Family Mart will donate money for children art

activities. McDonald's and NCF initiated donation activities after the 921 earthquake. Every time McDonald's sold a box of Happy Meal, it donated 10 NT dollars to the NCF to rebuild the Puli Christian Hospital. Talim dry cleaning chain store donated 0.8% of its revenue to the Eden Social Welfare Foundation to assist the refugees in Macedonia.

Previous studies found that CRM could increase consumers' positive attitude toward the company (Nan and Heo, 2007; Webb and Mohr, 1998). For example, CRM could increase consumers' brand attitude, brand awareness (Lafferty and Goldsmith, 2005), brand preference, brand loyalty and purchase intention (Smith and Alcorn, 1991). However, not all the CRM is successful. There exist some unstable elements (García, Gibaja, and Mujika, 2003). Some literature found that CRM strategies has no effect on consumers' brand attitude (Nan and Heo, 2007), product evaluation, purchase intention (Hamlin and Wilson, 2004) and purchase decision (Murphy, 1997). Some Studies found that consumers may doubt about motives of the enterprise engaging in cause-related marketing. Consumers may suspect that the business is really concerned about the social issues, or is concerned to increase sales, improve profits and enhance goodwill and other purposes, and thus they form a negative perception on cause-related marketing activities (Smith and Stodghill, 1994; Webb and Mohr 1998). Therefore, there are some literature focus on analyzing the fitness between images of the business and the NPOs. This stream of studies suggest that the higher the compatibility of CRM and business is , the more successful the donation will be (Drumwright, 1996; McDaniel, 1999). Till and Nowak (2000) pointed out that consumers' positive attitude toward the CRM is highly related to the fitness between the business and the NPOs (Trimble and Rifon, 2006). Therefore the first motive of this study is to explore the acceptance of CRM in Taiwan. Could CRM increase the purchase intention of Taiwanese consumers? In other words, is CRM an effective marketing tool?

Moreover, there are many factors that will affect the success of the CRM strategies. Among them, 'price' and product 'quality' will influence the effectiveness of the CRM (Murphy, 1997). For example, Barone *et al.* (2000) proposed that when the quality of the products is the same, 78% of consumers

will choose the product with CRM activities. However, if the price of the product with CRM is slightly higher, then 50% of consumers will buy the product. But if the price difference enlarges, only 17% of the consumers are willing to buy product with CRM, and the rest of the consumers would prefer cheaper but no incidental product.

In addition to price and physic product characteristics, CRM's type will also affect companies' sales. In general, CRM strategies could be divided into transaction-based support (TCRM) and non-transaction-based support (NTCRM) (Cui *et al.*, 2003). TCRM indicates that the donation of manufacturers is according to a certain percentage of the sales; NTCRM represents a certain amount of the donation. For example Pearle Vision Center donated U.S. \$45000 to Children's Miracle Network. Typhoon Morakot in southern Taiwan in 2009, Taiwan companies such as the Evergreen Group, Delta Electronics Enterprises donated money and materials more than NT \$ 500 million. These donations were not related to its sales and therefore are a NTCRM type.

To facilitate the comparison the TCRM and the NTCRM strategy, Cui *et al.* (2003) found that Y generations of U.S. students have more positive valuation on NTCRM. On the other hand, for TCRM-based marketing strategies, because it is related to sales volume or amount,, consumers have tendency to question the manufacturers the motive of cause- related marketing. Ellen *et al.* (2000) proposed that if consumers regard that manufacturers have the self-interested intention, then the effect of CRM will be limited. Consequently the second motive of this study is to compare the effectiveness of NTCRM and TCRM in order to understand if the 'type' of cause-related marketing (transaction versus non-transaction-based) will have different effects.

On the other hand, as the retailers gradually focus on brand image, more and more of them use CRM strategies to enhance their brand impression or brand image (Barone *et al.*, 2007). In the United States, grocery stores usually donate a certain proportion of the profits or sales to the local food banks to fund hunger or poverty at Christmas time (Varadarajan and Menon, 1988). The CVS company donated 25 cents for every \$35 revenue received to the United Nations Children's Fund (UNICEF). By doing so its sales increased 11% (Barone *et al.*, 2007). In

addition, since 2001, Blockbuster Entertainment cooperated with the UNICEF (Starlight Children's Foundation) for CRM alliance resulting in a success of its brand image and revenue (Business in the Community, 2004). However, the previous literature in comparing between NTCRM and TCRM strategies seldom focused on the issue that the CRM could reverse the competitive situation of the retailing store. As a result, the third motive of this study focuses on the brand competition with CRM strategies.

Prior studies on CRM were mostly on empirical study or experimental design. This article employs game theory to establish a duopoly model to analyze the CRM on firm's competitive equilibrium. This paper adopts the circle market model by Salop (1979), Reitzes (1992) and Clemenz (2010) to describe retailing market and uses two-stage sequential games to analyze the price competition of the duopoly² firms and the strategic interaction. Through comparative static analysis of the theoretical model and results of empirical research, we can compare the effects of NTCRM and TCRM strategy. This is also the fourth motive of this study.

This paper is divided into five sections, Section I presents the introduction, Section II constructs a duopoly of Bertrand competition retailer with CRM model. The third section is to conduct NTCRM TCRM comparative static analysis; Section IV conducts a survey. Section 5 contains the conclusion and recommendations.

2. Model of Retail Duopoly with CRM Strategy

As mentioned previously, there are two types of CRM that retailers can adopt. One is transaction-based CRM, or TCRM. The other is non-transaction-based CRM, or NTCRM. In this section, we construct a model

² If the price of products could not be changed easily, firms are likely to compete in Bertrand competition. For example, when the prices of firms are printed in catalogs or they announce prices by heavy advertisement, they are likely to behave in Bertrand price competition due to the huge cost of changing price (Pal, 1998). It is very costly to alter price and price choices are typically made prior to quantity decisions in the retail industry. Therefore, we adopt Bertrand competition to construct our model.

with two-stage game based on TCRM and NTCRM strategies in order to compare the price, sales, and profit effects between the TCRM and NTCRM strategies.

We followed Salop (1979) using a circle market with unit circumference to construct the spatial model. The Salop's model is a straightforward generalization of the linear Hotelling model (Clemenz, 2010). This model is used to examine a zonal band at a given latitude or a circle market. For example, the temperate zone around the northern part of the globe (Yu and Lai, 2003).

There were many studies using Salop's circle model to study issues of various industries by assuming that all firms located at equal distances from each other. In the literature of retail market, Balasubramanian (1998) and Cheng and Nault (2007) assumed that retailers were located at equal distances from each other on the circumference to discuss the issues of Internet channel. The former examined the competition between direct sellers and conventional retailers, while the latter analyzed a retailer's strategic game between existing retailer and a new entrant. Bakos (1997) analyzed the role of search costs in an electronic market featured with product differentiation. Martinez-Giralt and Neven (1988) expended their duopoly model to multi-outlets.

Regarding the literature of empirical study for the retail market, Clemenz and Gugler (2006) examined the locational choice and price competition for the Austrian retail gasoline market based on Salop's spatial competition model. Stewart and Davis (2005) applied Salop's model to estimate the accessibility and pricing among fast-food restaurants.³

Following the formulation by Salop (1979), Reitzes (1992) and Clemenz (2010), two retailers, X and Y, are located along a circle of unit circumference and

³ Regarding the literature of specific industry, Hyytinen and Takalo (2002), Niu (2008) and Toolsema (2004) applied Salop's model to study the competition of banks. These studies all assumed that banks were located at equal distances from each other on the circumference. Hyytinen and Toivanen (2003) assumed that venture capitalists were located symmetrically on a circle and a unit mass of entrepreneurs is distributed uniformly along the circle to analyze the issue of asymmetric information in the venture capital industry. Recently, Clemenz (2010) applied his model to study the impact of eco-labels on the abatement of emissions in a market with horizontal product differentiation. In the literature of international trade, Reitzes (1992) used Salop's model to discuss the issues of quality competition between home and foreign firms. More recently, Anderson and de Palma (2000) investigated the issue of globalization.

separated by the maximum possible distance 1/2. Each consumer purchases a single unit of a homogeneous good that can be obtained from either of the two retailers. Nevertheless, the retailers can differentiate product from their competitor via CRM, thus behaving as price makers.

2.1. Consumer Utility

Assuming the utility function is additively separable, and each consumer receives u^x units of utility from consuming the product of retailer X. For consumer z , the net utility from purchasing the product of retailer X is:

$$u^x(w^x, R^x) - td(z), \quad (1)$$

For the same consumer, the utility from consuming the product of retailer Y is:

$$u^y(w^y, R^y) - t\left[\frac{1}{2} - d(z)\right], \quad (2)$$

Where, w^x (w^y) is the donation amount of NTCRM by retailers X (Y), R^x (R^y) is the donation amount of TCRM per quantity of sales by retailers X (Y). Thereinafter, we will discuss the effects of NTCRM and TCRM strategies separately. Take retailer X for example, we let $R^x = 0$ when retailer X sponsors NTCRM and thus $u^x = u^x(w^x)$ due to utility function u^x is additively separable. In a similar way, we let $w^x = 0$ and $u^x = u^x(R^x)$ when retailer X sponsors TCRM.⁴ As mentioned above, past studies have shown that consumers' attitudes toward companies sponsoring CRM are positive. In addition, brand awareness is also positively influenced by the company's CRM activities (Lafferty and Goldsmith, 2005; Nan and Heo, 2007; Smith and Alcorn, 1991; Webb and Mohr, 1998). Therefore, we assume that the marginal utility of NTCRM and CRM are positive, that is, $u_w^x = du/dw > 0$ and $u_R^x = du/dR > 0$. The disutility of consumer z from consuming the product of retailer X is $td(z)$ depending on the distance between the consumer and the retailer, where $d(z)$ is

⁴ Accordingly, $R^y = 0$ and $u^y = u^y(w^y)$ when retailer Y sponsors NTCRM. $w^y = 0$ and $u^y = u^y(R^y)$ when retailer Y sponsors TCRM.

the shortest arc distance between consumer z and retailer X and t is unit transport cost. That is, the farther from retailer indicates the lower utility.

2.2. The Demand Functions

Denote the price of retailer X and Y are P^x and P^y . For maximum utility, each consumer will purchase one unit of retailer X 's product rather than purchasing Y 's product if net utility⁵ from consuming product of retailer X is larger than consuming that of Y , contrariwise.

Let d^* represent the marginal consumers who are indifferent between the two varieties.⁶ Based on Salop's model, retailer X and Y are located along a circle of unit circumference and separated by the maximum possible distance $1/2$. Therefore, the farther consumers are from the retailer, the less net utility they have from consuming the retailer's product. Thus there are two marginal consumers. There are x consumers counted from the left side of the retailer X 's location, who all buy one unit of retailer X 's product, that is, $x = d^*$. At the same time, there are x consumers counted from the right side of the retailer X 's location, who all buy one unit of retailer X 's product as well. Therefore, the total sales of retailer X will be $2x$:

$$2x = \frac{1}{t} \left[u^x(w^x, R^x) - u^y(w^y, R^y) - (P^x - P^y) \right] + \frac{1}{2}. \quad (3)$$

Equation (3) is the demand function of retailer X 's product.

Accordingly, there are y consumers counted separately from both the left side and right side of the retailer Y 's location, who all buy one unit of retailer Y 's product. As a result, the total sales of retailer X will be $2y$:

⁵ The net utility of consumer z consuming the product of retailer X is equal to the utility from consuming the X 's product minus transportation cost of z and price of X 's product, that is, $u^x(w^x, R^x) - P^x - td(z)$. Accordingly, the net utility of consumer z who consumes the product of retailer Y is $u^y(w^y, R^y) - P^y - t[1/2 - d(z)]$.

⁶ We can get d^* from solving the following equation:
 $u^x(w^x, R^x) - P^x - td = u^y(w^y, R^y) - P^y - t(1/2 - d)$.

$$2y = -\frac{1}{t} \left[u^x(w^x, R^x) - u^y(w^y, R^y) - (P^x - P^y) \right] + \frac{1}{2}. \quad (4)$$

Equation (4) is the demand function of retailer Y's product.

2.3. The Profit Functions of Retailer X and Y

We use two-stage sequential game to structure the competitive behavior in the circle duopoly market by assuming that only retailer X engages in NTCRM or TCRM. Thereinafter, we will discuss the profit function of each retailer.⁷

2.3.1. The Profit Functions in the Case of NTCRM

Owing to engaging in NTCRM, the profit function of retailer X equals his revenue of sales minus cost of sales and cost of NTCRM:

$$\Pi^x = 2 \left[P^x - C(x) \right] x - w^x, \quad (5)$$

where $C(x)$ is the sales cost function of retailer X, x is the market demand of retailer X's product (see equation (3), and $R^x = R^y = 0$). Assume that the marginal cost of sales is increasing, that is, $C'(x) > 0$ and $C''(x) > 0$.

The retailer Y does not engage in NTCRM, therefore, his profit function equals sales revenue minus sales cost:

$$\Pi^y = 2 \left[P^y - C(y) \right] y, \quad (6)$$

where $C(y)$ is the sales cost function of retailer Y, y is the market demand of retailer Y's product (see equation (4), and $R^x = R^y = 0$). Assume that $C'(y) > 0$ and $C''(y) > 0$.

2.3.2. The Profit Functions in the Case of TCRM

In a similar way, the profit functions of retailer X and Y are as follows under the situation that only retailer X engages in TCRM:

$$\Pi^x = 2 \left[P^x - R^x - C(x) \right] x, \quad (7)$$

⁷ The conclusions would not be changed even both retailer X and Y engage in NTCRM (or TCRM) at the same time, for the retailers are symmetric.

$$\Pi^y = 2[P^y - C(y)]y, \tag{8}$$

where $w^x = w^y = 0$.

2.4. The Optimal Strategies of Retailers in the Case of NTCRM

We start with investigating the effect of NTCRM strategy. Assume that only retailer X engages in NTCRM ($R^x = R^y = w^y = 0$) and the NTCRM decisions are made prior to pricing choices. We construct the competitive behavior of the retailers by setting a sequential game of complete and perfect information, and therefore we apply the backward induction approach to find the subgame-perfect Nash equilibrium of the game.

According to backward induction, we start at the second stage in which retailers X and Y choose their pricing simultaneously. After that, we turn to first stage to decide the optimal NTCRM strategies of the retailers.

2.4.1. The Second Stage: The Optimal Pricing of Retailers

The objects of retailer X and Y are to decide their pricing P^x and P^y in order to maximize their profit (see equations (5) and (6)) separately. With the corresponding demand functions as equations (3) and (4), the first order conditions (F. O. C.) for the second stage are as below:

$$2x - \frac{1}{t}[P^x - C(x) - C'(x)x] = 0, \tag{9}$$

$$2y - \frac{1}{t}[P^y - C(y) - C'(y)y] = 0, \tag{10}$$

We assume that the second order conditions (S. O. C.) and the stability conditions are satisfied to ensure getting interior solution.⁸ The Nash equilibrium of Bertrand competition indicates the optimal pricing of retailer X and Y.⁹

⁸ The S. O. C. ($\Pi_{P^x P^x}^x = d^2\Pi^x/dP^{x^2} = -(2 + \bar{X})/t < 0$ and $\Pi_{P^y P^y}^y = d^2\Pi^y/dP^{y^2} = -(2 + \bar{Y})/t < 0$) and the stability conditions for equilibrium of Bertrand competition ($\Pi_{P^x P^x}^x \Pi_{P^y P^y}^y - \Pi_{P^x P^y}^x \Pi_{P^y P^x}^y = (3 + \bar{X} + \bar{Y})/t^2 > 0$) are all satisfied, where $\bar{X} = [C'(x) + C''(x)x/2]/t$, $\bar{Y} = [C'(y) + C''(y)y/2]/t$.

⁹ Substituting equation (3) into equations (9) and (4) into (10), we can find the optimal pricing of retailer X and Y by the simultaneous solution of equations (9) and (10).

Furthermore, we will discuss the price, sales and profit effects of NTCRM strategy with comparative static analysis in the section 3.

2.4.2. The First Stage: The Optimal NTCRM Strategies of Retailer

Turning to first stage of the sequential game, we determine the optimal donation amount of NTCRM of retailer X. The object of retailer X is to decide his donation amount of NTCRM w^x in order to maximize his profit (see equation (5)) given the corresponding demand functions of equation (3) and (4) and the optimal pricing rule of retailer X and Y in the second stage (see equation (9) and (10)). The F. O. C. for the retailer X is:¹⁰

$$\frac{2x(2 + \bar{X})u_{w^x}}{3 + \bar{X} + \bar{Y}} = 1, \quad (11)$$

Equation (11) states that the optimal donation amount of NTCRM must satisfy the condition as follows: The marginal increase in the profit of retailer X made by the increase in consumers' utility due to NTCRM strategy just equals the marginal increase in the cost of sponsoring NTCRM. We assume that the marginal utility of NTCRM is decreasing ($u_{w^x w^x} = d^2 u^x / dw^{x2} < 0$) to satisfy the S. O. C. of first stage of the sequential game.^{11,12}

2.5. The Optimal Strategies of Retailers in the Case of TCRM

Thereinafter, in a similar way, we investigate the decisions of retailers X and Y in the case that X sponsors TCRM ($w^x = w^y = R^y = 0$).

¹⁰ The F. O. C. of first stage is: $[2tx(1 + \bar{X}) + P^x - C(x) - C'(x)x]u_{w^x} / [t(3 + \bar{X} + \bar{Y})] - 1 = 0$. Substituting the F. O. C. of second stage (equation (9) and equation (10)) into the F. O. C. of the first stage, we can obtain the equation (11).

¹¹ The S. O. C. of first stage for maximizing profit of retailer X is: $\Pi_{w^x w^x}^x = d^2 \Pi^x / dw^{x2} < 0$, where $\Pi_{w^x w^x}^x = 2x(2 + \bar{X})u_{w^x w^x} / (3 + \bar{X} + \bar{Y}) + \{(2 + \bar{X})[2t(3 + \bar{X} + \bar{Y}) + x\bar{Y}] + x(1 + \bar{Y})\bar{X}\} \{u_{w^x}\}^2 / [2t^2(3 + \bar{X} + \bar{Y})^3]$, $\bar{X} = 3C''(x) + C'''(x)x$ and $\bar{Y} = 3C''(y) + C'''(y)y$. If $u_{w^x w^x} > 0$ then $\Pi_{w^x w^x}^x > 0$, as a result, the S. O. C. of first stage for maximizing profit is not satisfied.

¹² When the marginal cost of sales are both constant for retailer X and Y and the utility function of consuming X's product is sufficiently convex, the S. O. C. of first stage for maximizing X's profit could be satisfied. That is, when $C''(x) = C''(y) = C'''(x) = C'''(y) = 0$ and $-u_{w^x w^x} / u_{w^x} > 1 / \{4x^2 [2t + C'(x)]\}$, we can ensure $\Pi_{w^x w^x}^x < 0$.

2.5.1. The Second Stage: The Optimal Pricing of Retailers

The objects of retailers are to determine their pricing P^x and P^y in order to maximize their profit (see equations (7) and (8)) separately in the second stage. With the corresponding demand functions of equations (3) and (4), the F. O. C. are:

$$2x - \frac{1}{t} [P^x - R^x - C(x) - C'(x)x] = 0, \quad (12)$$

$$2y - \frac{1}{t} [P^y - C(y) - C'(y)y] = 0, \quad (13)$$

Similarly, the S. O. C. and the stability conditions for the equilibrium of Bertrand competition are satisfied.

2.5.2. The First Stage: The Optimal NTCRM Strategies of Retailer

Returning to first stage of the sequential game, we determine the optimal donation amount of TCRM per quantity of sales by retailer X. The object of retailer X is to decide his donation amount of TCRM per quantity of sales w^x in order to maximize his profit (see equation (7)) given the corresponding demand functions as equations (3) and (4) and the optimal pricing rule of retailer X and Y in the second stage (see equation (12) and (13)). The F. O. C. for retailer X is:¹³

$$\frac{2x(2 + \bar{X})(u_{R^x} - 1)}{3 + \bar{X} + \bar{Y}} = 0. \quad (14)$$

We assume that the marginal utility of TCRM is decreasing ($u_{R^x R^x} = d^2 u^x / dR^{x^2} < 0$) to satisfy the S. O. C. of first stage of the sequential game.¹⁴ Equation (14) indicates that the optimal donation amount of TCRM must satisfy the condition as follows: The marginal increase in consumers' utility due to

¹³ The F. O. C. of first stage is: $[P^x - R^x - C(x) - C'(x)x + 2tx(1 + \bar{X})(u_{R^x} - 1)] / (t(3 + \bar{X} + \bar{Y})) = 0$. Substituting the F. O. C. of the second stage (equation (12) and equation (13)) into the F. O. C. of the first stage, we can obtain the equation (14).

¹⁴ The S. O. C. of first stage for maximizing retailer X's profit is: $\Pi_{R^x R^x}^x = d^2 \Pi^x / dR^{x^2} < 0$. Substituting the F. O. C. of the first and second stages into the S. O. C. of the first stage, we can obtain $\Pi_{R^x R^x}^x = 2x(2 + \bar{X})u_{R^x R^x} / (3 + \bar{X} + \bar{Y})$. If $u_{R^x R^x} > 0$ then $\Pi_{R^x R^x}^x > 0$, as a result, the S. O. C. of first stage for maximizing profit is not satisfied.

TCRM strategy just equals the marginal increase in the donation amount of TCRM per quantity of sales, that is, the marginal utility of consuming the TCRM product just equals 1 ($u_{R^x} = 1$). By engaging in TCRM, retailer X can raise the marginal utility of his consumers; nevertheless, he increases the cost of his own as well. For maximizing profit, retailer X will choose the donation amount of TCRM to satisfy the condition: the marginal cost equals the marginal utility owing to the donation.

3. Comparative Static Analysis

3.1. Comparative Static Analysis of NTCRM

We apply comparative static analysis to discuss the price, sales and profit effects of NTCRM strategy. The result of comparative static analysis of retailers' optimal decision is shown as Table 1. From the second column of Table 1, we found (1) in the aspect of "price": by using NTCRM strategy, X retailer can raise price and make the opponent lower price, which is emanated by the CRM's differentiating the product and raising consumers' utility. Meanwhile the price effect is larger when the marginal utility of NTCRM is higher.

(2) In the aspect of "sales": although retailer X's NTCRM strategy brings higher optimal price for retailer X than retailer Y, the sales of retailer X still increases and causes the sales of retailer Y to decrease. The larger the marginal utility of NTCRM is, the more the effect of sales will be.

And, (3) in the aspect of profit effect: retailer X who engages in NTCRM strategy will increase or decrease its profit either way, while retailer Y's profit always decreases. The larger the marginal utility of NTCRM is, the less the profit of retailer Y will get.

Based on results above, we state the proposition 1 as below:

Proposition 1: Other things being equal, a retailer who engages in NTCRM will be able to raise the price and sales of his product, and lower the opponent retailer's price, and further cause the opponent retailer's sales and

profit to decrease; however, the effect on his profit is ambiguous. The higher the marginal utility of NTCRM is, the more likely the profit of the retailer sponsoring NTCRM will increase.

Table 1
The Comparative Static Results of NTCRM Strategy

Endogenous Variables f	NTCRM Strategy (df/dw^x)
Price of retailer X: P^x	$\frac{(1 + \bar{X})u_{w^x}}{(3 + \bar{X} + \bar{Y})} > 0$
Price of retailer Y: P^y	$-\frac{(1 + \bar{Y})u_{w^x}}{3 + \bar{X} + \bar{Y}} < 0$
Difference between the price of retailers X and Y: $P^x - P^y$	$\frac{(2 + \bar{X} + \bar{Y})u_{w^x}}{3 + \bar{X} + \bar{Y}} > 0$
Sales of Retailer X: x	$\frac{1}{2t} \frac{u_{w^x}}{3 + \bar{X} + \bar{Y}} > 0$
Sales of retailer Y: y	$-\frac{1}{2t} \frac{u_{w^x}}{3 + \bar{X} + \bar{Y}} < 0$
Profit of retailer X: Π^x	$\frac{2(2x + \bar{X})u_{w^x}}{3 + \bar{X} + \bar{Y}} - 1$
Profit of retailer Y: Π^y	$-\frac{2(2y + \bar{Y})u_{w^x}}{3 + \bar{X} + \bar{Y}} < 0$

Generally speaking, duopoly firms' price competition is featured with strategic complementarity, meaning that when one firm raises price due to cost increase, the other firm will simultaneously raise his price. However, the proposition 1 concludes that retailers' price competition violates the feature of strategic complementarity when one retailer engages in NTCRM unilaterally. The reason is that, when compared to other products, the product connected with NTCRM will bring more utility for consumers (see equations (1) and (2)) and

renders the relative utility for the product not connected to NTCRM lower, so consumers are willing to pay more for NTCRM connected product. As a result, a retailer can differentiate its products by NTCRM and further facilitates consumers' willingness to pay and intention to purchase.

Moreover, there are two parts of profit effects when retailer X engages in NTCRM: the price, sales and profit of retailer X will increase, on the contrary, his cost will increase and thus less profit will be earned. Therefore, whether the profit of retailer X can rise or not depends on relative effects of the two conditions mentioned previously, that is, if $u_{w^x} \begin{matrix} \geq \\ < \end{matrix} (3 + \bar{X} + \bar{Y})/[2(2x + \bar{X})]$, then $d\pi^x/dw^x|_{p^x, p^y} \begin{matrix} \geq \\ < \end{matrix} 0$ (see table 1 line 6).

Based on that when the retailer's donation is not related to sales, other things being equal, the larger the NTCRM's marginal utility is, the more positive brand evaluation and awareness of consumers will be brought by donation of the retailer. Therefore, the optimal price of the retailer (see Table 1 lines 1 and 4) as well as the price difference between the opponent retailer (see Table 1 lines 1 and 3) will be higher. Also, the retailer sponsoring NTCRM can gain more profit (see Table 1 line 6). Meanwhile, while buying the products with NTCRM will bring more utility, consumers' relative utility of buying the products without NTCRM will decrease, which encourages them to buy the products with NTCRM. Furthermore, the higher the marginal utility of NTCRM is, the more likely the profit of the retailer sponsoring NTCRM will increase (see Table 1 line 6). In conclusion, the larger the NTCRM's marginal utility is, the lower price, sales and profit of the retailer not sponsoring NTCRM will be.

3.2. Comparative Static Analysis of TCRM

Thereinafter, we apply comparative static analysis to discuss the effect of TCRM strategy. From the second column of Table 2, we found (1) in the aspect of "price": X retailer can raise his price by differentiating his product via TCRM. The TCRM strategy can increase the price difference between retailers X and Y, meanwhile the price difference effect is larger when the marginal utility of TCRM is higher.

(2) In the aspect of “sales”: the effects on retailers X and Y’s sales by sponsoring TCRM are ambiguous depending on the marginal utility of TCRM.

Finally (3) in the aspect of profit effect: the effects on retailers X and Y’s profit by sponsoring TCRM is ambiguous depending on the marginal utility of TCRM.

Table 2
The Comparative Static Results of TCRM Strategy

Endogenous Variables f	TCRM Strategy (df/dR^x)
Price of retailer X: P^x	$\frac{(1 + \bar{X})u_{R^x} + (2 + \bar{Y})}{(3 + \bar{X} + \bar{Y})} > 0$
Price of retailer Y: P^y	$-\frac{(1 + \bar{Y})(u_{R^x} - 1)}{3 + \bar{X} + \bar{Y}}$
Difference between the price of retailers X and Y: $P^x - P^y$	$\frac{1 + (2 + \bar{X} + \bar{Y})u_{R^x}}{3 + \bar{X} + \bar{Y}} > 0$
Sales of retailer X: x	$\frac{1}{2t} \frac{u_{R^x} - 1}{3 + \bar{X} + \bar{Y}}$
Sales of retailer Y: y	$-\frac{1}{2t} \frac{u_{R^x} - 1}{3 + \bar{X} + \bar{Y}}$
Profit of retailer X: Π^x	$\frac{2x(2 + \bar{X})(u_{R^x} - 1)}{3 + \bar{X} + \bar{Y}}$
Profit of retailer Y: Π^y	$-\frac{2y(2 + \bar{Y})(u_{R^x} - 1)}{3 + \bar{X} + \bar{Y}}$

Based on results above, we state the proposition 2 as below:

Proposition 2: Other things being equal, a retailer who engages in TCRM will be able to raise the price of his product; however, the effects on sales and profit of himself and the effects on price, sales and profit of opponent are ambiguous depending on the marginal utility of TCRM. As retailer’s donation is included in basis of sales, the cost per sales of the retailer sponsoring TCRM will increase, and the optimal price of the retailer with and without TCRM will both

rise due to the feature of strategic complimentary. On the other hand, TCRM will bring positive brand evaluation and awareness for consumers and as a result their willingness to pay for and intention to purchase the products of the retailer with TCRM will increase, On the other hand, the products of the retailer without TCRM will decrease. Besides, according to the substitution effect, the price increase of the retailer who sponsors TCRM will lead to sales increase of the product without TCRM and sales decrease of the product with TCRM.

As a result, the retailer can differentiate products by TCRM and further raise his optimal price (see Table 2 line 1) and increase the price difference with respect to opponent (see Table 2 line 3). However, the effects on the opponent's price and the sales of the firm and opponent are ambiguous depending on the relative effects of the marginal cost and utility of TCRM (see Table 2 line 2, 4 and 5). Due to the ambiguities of the sales effects, the profit effects of retailers are also ambiguous, depending on the marginal cost and utility of TCRM (see Table 2 line 6 and 7).

3.3. The Comparison between TCRM and NTCRM

In this section, we discuss whether the TCRM and NTCRM cause the reverse effect or not. First, in the case of NTCRM: the direction of the effects on the price and sales is coincident. That is, NTCRM does not cause the reverse effect. According to the results of comparative static (see Table 1), the price and sales of the retailer sponsoring NTCRM always rise while the price, sales and profit of the retailer without NTCRM always decrease, regardless of the retailer's sponsorship equals to the optimal donation amount (the amount that just satisfies equation (11)) or not. NTCRM strategy always has the purchase-switch effect that some consumers switch their purchases from the product without NTCRM to the product with NTCRM even when the retailer's sponsorship does not equal to the optimal donation amount.

Second, in the case of TCRM: the price and sales effects of TCRM are depended on the donation amount per sales. The critical point of the reverse effect is the optimal donation amount per sales (the amount that just satisfies equation (14)). We discuss the reverse effect of TCRM as follows.

According to the F. O. C. of retailer X in the first stage of the sequential game, the optimal donation amount per sales of retailer X must satisfy the condition of $u_{R^x} = 1$, that is, the marginal increase in the optimal donation amount per sales just equals the marginal increase in the consumers' utility. Substituting the condition above to the results of comparative static in Table 2, we can obtain: $dP^x/dR^x = 1$, $dP^y/dR^x = 0$, $dP^x/dR^x - dP^y/dR^x = 1$, $dx/dR^x = 0$, $dy/dR^x = 0$. That is, a slight increase in the donation amount per sales of retailer X will further lead to an increase in his price that just equals the amount of the former when his sponsorship equals to the optimal donation amount per sales.

Due to the assumption of diminishing marginal utility $u_{R^x R^x} < 0$, the marginal utility derived from TCRM is larger than that of optimal donation amount per sales when the retailer's sponsorship is lower than the optimal donation ($u_{R^x} > 1$). Substituting the inequality above to the results of comparative static in Table 2, we can obtain: $dP^x/dR^x > 1$, $dP^y/dR^x < 0$, $dP^x/dR^x - dP^y/dR^x > 1$, $dx/dR^x > 0$, $dy/dR^x < 0$, $d\Pi^x/dR^x > 0$ and $d\Pi^y/dR^x < 0$. That is, an increase in donation amount per sales of retailer X will lead to a higher increase in his price compared with the former as his sponsorship is lower than the optimal donation amount per sales. Furthermore, the sales and profit of retailer X will increase and the price, sales and profit of retailer Y will decrease simultaneously. Consequently, the TCRM strategy still has the purchase-switch and profit-shifting effects when the sponsorship of retailer X is lower than the optimal donation amount per sales. Based on results above, we state the following proposition:

Proposition 3: Other things being equal, a TCRM strategy will lead to a larger increase in the retailer's price compared with the increase in donation amount per sales, and creates the purchase-switch and profit-shifting effects when the sponsorship is lower than the optimal donation amount per sales.

Similarly, the marginal utility derived from TCRM will be lower than that of optimal donation when the retailer's sponsorship is larger than the optimal donation amount per sales ($u_{R^x} < 1$). Substituting the inequality above to Table 2, we can obtain: $dP^x/dR^x < 1$, $dP^y/dR^x > 0$, $dP^x/dR^x - dP^y/dR^x < 1$,

$dx/dR^x < 0$, $dy/dR^x > 0$, $d\Pi^x/dR^x < 0$ and $d\Pi^y/dR^x > 0$. That is, an increase in donation amount per sales of retailer X will lead to an increase in his price; however, the latter is smaller than the former when the sponsorship is larger than the optimal donation amount per sales. In addition, the sales of retailer X will decrease and the price, sales and profit of retailer Y will go up simultaneously. Hence, TCRM strategy will have the reverse purchase-switch and reverse profit-shifting effects when the sponsorship of retailer X is larger than the optimal donation amount per sales. Some consumers will transfer their purchases from the product with TCRM to the product without TCRM. Some profit of the retailer engaging in TCRM will be shifted to the retailer not engaging in TCRM. Hence we put forth the proposition as shown below:

Proposition 4: Other things being equal, a TCRM strategy will lead to a lower increase in retailer's price compared with the increase in donation amount per sales, and creates the reverse purchase-switch and reverse profit-shifting effects when the sponsorship is higher than the optimal donation amount per sales.

As mentioned above, the retailer who engages in TCRM will be able to raise the price of his product; however, the effect on sales of the firm and the effects on price, sales of opponent are ambiguous depends on the relative size of the marginal cost and marginal utility of TCRM. The marginal utility derived from TCRM will be larger than the marginal cost when the sponsorship is lower than the optimal donation amount per sales. Therefore, the TRCRM strategy will increase consumers' willingness to pay and intention to purchase due to its increase in utility. However, it also induces decrease in consumers' willingness to pay and intention to purchase caused by its price increase. Nevertheless, the latter is less obvious than the former and thus we concluded that a TCRM strategy will lead to an increase in retailer's sales, price and profit, contrariwise.

Besides, based on the feature of strategic complementarity on the price competition of duopoly, the increase in the cost of the retailer by engaging in TCRM will lead to an increase in the opponent's price. On the other side, the TCRM strategy will cut down the relative utility and consumers' willingness to

pay for the product without TCRM. As a result, the marginal utility derived from TCRM is larger than the donation amount per sales when the sponsorship cost is larger than the optimal donation amount per sales. In this situation, the decrease in the relative utility of the product without TCRM will be larger than the effect of strategic complementarity on price, and thus cuts down the price, sales and profit of the retailer not engaging in TCRM, contrariwise.

Table 3
The Strategy Effects of NTCRM and TCRM for Retailers

	Increase in the Donation Amount of NTCRM w		Increase in the Donation Amount of TCRM Per Sale R	
	Case 1 ^a	Case 2 ^b	Case 1 ^a	Case 2 ^b
Price of retailer with CRM	increase	increase	increase; marginal increase is larger than that of R	increase; marginal increase is smaller than that of R
Price of retailer without CRM	decrease	decrease	decrease	increase
Price of retailer with CRM compare to that without CRM	higher	higher	higher; larger than marginal increase of R	higher; smaller than marginal increase of R
Sales of retailer with CRM	increase	increase	increase	decrease
Sales of retailer without CRM	decrease	decrease	decrease	increase
Profit of retailer with CRM	increase	decrease	increase	decrease
Profit of retailer without CRM	decrease	decrease	decrease	increase

Note a: Case 1 represents the situation in which the donation amount (donation amount per sales) of the retailer sponsoring NTCRM (TCRM) is smaller than his optimal donation amount (donation amount per sales).

Note b: Case 2 represents the situation in which the donation amount (donation amount per sales) of the retailer sponsoring NTCRM (TCRM) is larger than his optimal donation amount (donation amount per sales).

Finally, the strategic effects on NTCRM and TCRM are summarized in Table 3. We use optimal donation as critical point and demonstrate the followings: (1) both NTCRM and TCRM strategies can differentiate products and result in a higher retailing price. (2) NTCRM does not create the reverse effect on price and sales, while it always brings the purchase-switch effect regardless of the equality of retailer's sponsorship to the optimal donation amount. (3) We find that TCRM has the reverse effect on the price and sales by using the optimal donation as a critical point. To sum up, according to the results of the sequential game, we can now respond to the first motive of this study and conclude that the CRM is still an effective marketing tool as long as the donation amount is not too high. By comparing (2) with (3), the effects of TCRM and NTCRM are different; that is, the strategic effects of CRM by transaction-based support and non-transaction-based support have different outcomes. According to the different effects of NTCRM and TCRM, we can now respond to the second motive of this study as well.

4. Empirical Study

This section deals with the empirical study that sheds light on real world in Taiwan.

4.1. Sampling and question design

The study uses convenient sampling to collect the data: 7-11 and Family Mart are our target companies. The sampling design is shown in Table 4. There are four sampling cells, and in each cell we collect 60 samples. The sample's basic data are shown in Appendixes A and B.

4.2. Manipulation Check

This study uses two manipulation checks. First, we check if the product quality of two retailing stores is similar? According to Table 5 (line 3), the average scores (both TCRM and NTCRM) are higher than 4, which indicates that the

respondents regards the product quality of the two retailer are the same. Next, this study asks the respondents "Do 7-11 and Family Mart are two biggest retailing stores in Taiwan?" The average scores are higher than 5, which indicates that the respondents agree that 7-11 and family Mart are the top two retailing stores in Taiwan. Therefore, the manipulation succeeds.

Table 4
Sampling Distribution and Valid Respondent Rate

	NTCRM		TCRM	
	Family Mart	7-11	Family Mart	7-11
Samples (respondent rate)	41 (68.3%)	45 (75.0%)	47 (78.3%)	51 (85%)

Table 5
Manipulation Check

Item	NTCRM			TCRM		
	Family Mart	7-11	Significance	Family Mart	7-11	Significance
Same quality	5.05	4.58	0.142	5.13	5.08	0.863
Top two retailing stores	6.03	5.38	0.062	6.26	5.9	0.181

Note: the study uses Likert 7-point scales.

4.3. Preliminary Analyses

Table 6 shows the means of measurement for the motives of the two retailing stores. Webb and Mohr (1998) also use CRM strategies to realize how consumers regard the CRM strategies taken by a company. As can be seen in Table 6, most of the respondents agree that the 7-11 and Family Mart use CRM tool for assisting the disadvantaged. They also think that the two stores have another motive to implement the CRM strategies (e.g., increase sales and profits).

When the respondents are asked if they would likely to buy product with CRM? They tend to agree. This result is consistent with the first motive of the study. That is, consumers agree the company will implement CRM to help the disadvantaged and the consumers will buy the product with CRM.

Moreover, when comparing NTCRM with TCRM strategies, the respondents agree that the retailing store may use TCRM (vs. NTCRM) to increase its sales (4.87 vs. 4.81) and profit (4.41 vs. 4.29). On the other hand, respondents think the corporate implementing NTCRM strategies are "to help the disadvantaged," the average score is also higher than TCRM. In sum, respondents have higher assessment on NTCRM strategies. The result is consistent with Cui *et al.* (2003) and our second motive.

Table 6
The Motives of the CRM: Consumer Aspect

Items	NTCRM Mean			TCRM Mean		
	Family Mart	7-11	All Samples	Family Mart	7-11	All Samples
CRM is for assisting the disadvantaged	5.34	5.00	5.16	4.79	5.00	4.90
Increase sales	4.60	5.00	4.81	4.94	4.80	4.87
Increase profits	3.92	4.62	4.29	4.55	4.27	4.41
Consumer will buy product with CRM	4.15	4.57	4.36	4.04	4.08	4.06

Note: the study uses Likert 7-point scales.

4.4. Policy Effect Analyses

In this study, we consider the consumer's law of demand (see Equations (1) to (4)) to determine the optimal decision of the retailers. In other words, retailers' sales depend on consumers' purchase intention and purchase behavior. Next, this study conducts an empirical study to verify the propositions proposed in the study.

Table 7
Strategy Effect of NTCRM^{a,b}

Items	Donation					
	Amount: High ^c			Amount: Low ^d		
	Family Mart	7-11	All Samples	Family Mart	7-11	All Samples
◇ Retailer with CRM increases product price by 1%; non CRM retailer reduces product price by 1%.	4.71	4.67	4.69	4.68	4.09	4.37
◇ Retailer with CRM increases product price by 3%; non CRM retailer reduces product price by 3%.	4.00	4.04	4.02	3.95	3.49	3.71
◇ Retailer with CRM increases product price 5%; non CRM retailer reduces product price by 5%.	3.05	2.59	2.82	3.20	2.71	2.94
◇ Retailer with CRM increases product price by 10%; non CRM retailer reduces product price by 10%.	2.41	2.02	2.21	2.73	2.24	2.48
◇ Retailer with CRM increases product price by 15%; non CRM retailer reduces product price by 15%.	2.07	1.68	1.88	2.37	1.93	2.14

Note a: Likert 7-point scales. Note b: Average score. Note c: donate 100 million dollars. Note d: donate 50 million dollars.

4.4.1. Verification of Proposition 1

First, this study assumes the amount of donation is divided into two types: high (NT\$ 100 million) and low (NT\$ 50 million). As can be seen in Table 7 that (1) when the retailer implements NTCRM and low donation, even he raises its prices by 1% and the opponent retailer has 1% price cuts, consumers are still willing to purchase the product with NTCRM (average is 4.37); (2) when the

retailer implement high NTCRM donation, even he raises its prices by 1% and the opponent retailer has 1% price cuts, more consumers turn to buy the product with NTCRM (average is 4.69); Even when the retailer raise its price by 3% and the opponent retailer has 3% price cuts, there still are some consumers who would like to buy the product with NTCRM (average is 4.02). Consequently, according to Table 7, if the retail store deals with NTCRM then he can raise his product price and the consumers would still like to buy his product, therefore the proposition 1 has been verified.

Table 8
Strategy Effect of TCRM

Items	Family Mart	7-11	All Samples
Donate NT\$ 0.9 (retailer increases by \$1, the rival reduces by \$1)	3.66	4.71	4.20
Donate NT\$ 2.9 (retailer increases by \$3, the rival reduces by \$2)	3.11	4.08	3.61
Donate NT\$ 8 (retailer increases by \$8, the rival reduces by \$1)	3.17	3.96	3.58
Donate NT\$ 13.5 (retailer increases by \$13, the rival reduces by \$0)	2.94	3.82	3.40

4.4.2. Verifications of Propositions 2, 3, 4

Next, we discuss the effects of TCRM strategy. As can be seen in Table 8, when the retailer implements TCRM and donates 0.9/per unit, then if the retailer raises its price by NT \$1 dollar and the rival retailer reduces by NT \$1 dollar, the consumer would like to buy product with TCRM (average 4.20). It indicates that when a retailer implements TCRM strategy, even the margin of price increase is larger than the margin of donation, consumers still tend to buy product with TCRM. Therefore, proposition 3 is now verified.

However, if the retailer with TCRM continues to increase his donation/per unit, even the margin of price increase is smaller than the margin of donation

increase, the transfer purchase can still decline. Table 8 shows that the average score is only 3.61, lower than median number 4.

If the retailer with TCRM further increases his donation/per unit, even the margin of price increase is lower than the margin of donation increase, and the rival retailer also slightly increase his price, the consumers still turn to buy rivals retailer's product. As can be seen in Table 8, when the retailer with TCRM increases his donation by \$ 13.5/per unit, the price increases is \$13 (lower than the increase of donation) and the rival retailer increases by \$2, consumer would be unlikely to buy the product of the retailer with TCRM (average is 3.40). Therefore, proposition 4 is verified.

In sum, retailers implement NTCRM or TCRM strategies could increase the product price. Under the NTCRM strategy, the purchase-switch effect exists. However, Under TCRM strategy, when the donation/per unit is too high, the purchase-switch effect does not exist. These results are also in agreement with the third motive; that is, retailer could use CRM strategies to change the competition situation with the rivals.

5. Conclusions and Managerial Implications

This study employs a key concept by Salop (1979), Reitzes (1992), and Clemenz (2010): circle market with unit circumference to construct the spatial model. After the theoretic model development and empirical study, this study obtains several useful conclusions: First, consumers tend to buy products with CRM because the companies support the disadvantaged.

Second, other things being equal, retailer implementing NTCRM strategy could raise the price of his product and increase his sales; the rival retailer will reduce the price and sales, and profit will decrease. However, the profit of the retailer may increase or decrease. This result is consistent with previous studies (Smith and Alcorn, 1991; Barone *et al.*, 2007; Varadarajan and Menon, 1988).

Third, other things being equal, retailer implements TCRM could raise his product price. However, the effects of his sale, profit, rival retailer's price, profit, and sales depend on the marginal utility of TCRM strategies. As suggested by

Barone *et al.* (2000), if the price of the product with TCRM is higher, then the advantage of TCRM will be offset by the disadvantage of price increase.

Forth, in general, the retailer could increase his product price no matter he implements NTCRM or TCRM strategies. Moreover, the purchase-switch effect does exist with the NTCRM strategies but has ambiguous effect under TCRM strategies.

The managerial implications of this study are: first, retailer could use CRM strategies to differentiate his product to increase the product price. Therefore, CRM could be regarded as the useful marketing promotion tool.

Second, as NTCRM strategies could increase his own product price and let rivals to reduce their prices, and the purchase-switch effect is expected to exist. Therefore, the company could select NTCRM as the marketing promotion strategies.

Third, as the TCRM strategies may not give rise to the purchase-switch and profit-shifting effects. The purchase-switch exists only when the TCRM is lower than the optimal donation per sales. Therefore, in order to carry out the strategy, the company implementing TCRM strategy should consider the unit amount of the donation and the price increments, so as not to cause the reverse effect.

This study has shortcomings in research design, which may limit the generalization of the findings. The shortcomings include (1) a limited number of store types examined; (2) the method of survey uses convenient sampling; (3) the CRM-related issue could center on the negative perception of the CRM to consumers which in turn may damage company's brand equity.

Appendix A
Basic Data of NTCRM Case

Variables	Level	Number	(%)	Variables	Level	Number	(%)	
Sex	Male	20	24.7		non	5	6.0	
	Female	61	75.3		Students	14	16.7	
	Total	81	100		Representative of the people, the chief executives and managers	5	6.0	
Age	Below 19	1	1.2	Occupation	Professionals	16	19.0	
	20~24	15	17.4		staff	20	23.8	
	25~29	10	11.6		Service staff and sales clerks	7	8.3	
	30~34	19	22.1		Agriculture, forestry and fisher staff		1.2	
	35~39	8	9.3		Technical workers and related workers	1	1.2	
	40~44	10	11.6		Others	15	17.9	
	45~49	2	2.3		Total	86	100	
	50~54	10	11.6			Below 15,000	19	23.5
	55~59	8	9.3			15,001~25,000	7	8.6
	Over 60	3	3.5			25,001~35,000	15	18.5
Total	86	100		35,001~45,000	9	11.1		
Education	Higher school	2	2.4	Income/ per month	45,001~55,000	14	17.3	
	Senior high school	8	9.4		55,001~65,000	4	4.9	
	College and university	37	43.5		Above 65,001	13	16	
	Master	38	44.7		Total	81	100	
	Total	85	100			Every day	30	35.3
Location	The northern region	75	90.4	Frequency	2-3 days	24	28.2	
	The central region	2	2.4		4-7 days	16	18.8	
	The south region	4	4.8		Every two weeks	5	5.9	
	Other region	2	2.4		Monthly	9	10.6	
	Total	83	100		Never	1	1.2	
						Total	85	100

Appendix B

Basic Data of TCRM Case

Variables	Level	Number	(%)	Variables	Level	Number	(%)
Sex	Male	44	46.3	Occupation	non	4	4.2
	Female	51	53.7		Students	4	4.2
	Total	95	100		Representative of the people, the chief executives and managers	4	4.2
Age	Below 19	1	1.0		Professionals	23	24.0
	20~24	2	2.1		staff	5	5.2
	25~29	25	26.0		Service staff and sales	12	12.5
	30~34	34	35.4		Agriculture, forestry and fisher staff	22	22.9
	35~39	17	17.7		Technical workers and related workers	1	1.0
	40~44	7	7.3		Others	21	21.9
	45~49	5	5.2		Total	96	100.0
	50~54	4	4.2		non	12	12.5
	55~59	1	1.0		Students	2	2.1
	Over 60	96	100.0	25,001~35,000	33	34.4	
Education	Higher school	1	1.0	Income/per month	35,001~45,000	26	27.1
	Senior high school	12	12.4	45,001~55,000	4	4.2	
	College and university	44	45.4	55,001~65,000	6	6.3	
	Master	40	41.2	Above 65,001	13	13.5	
	Total	97	100	Total	96	100.0	
	Location	The northern region	92	97.9	Frequency	Every day	34
The central region		1	1.1	2-3 days		42	43.8
The south region		1	1.1	4-7 days		17	17.7
Other regions		94	100	Every two weeks		3	3.1
				Monthly		96	100

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