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Full Length Research Paper

Is enlarging the market share the best strategy for maximizing profits?

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This paper determines the best market strategy that can enable a firm to maximize its profit. An advanced panel threshold regression model is employed to investigate the panel threshold effect of market share on firm profits among publicly traded Taiwan firms. The results confirm that the double threshold effect does exist between market share and profit. Some important policy implications emerge from the findings.

Key words: Market share, profit, panel threshold regression model.

INTRODUCTION

The purpose of this paper is to explore the answer to the question on what best strategy a firm should undertake to enlarge its market share. In this study, a panel threshold model was used to investigate the relationship between market share and profit in Taiwan’s industry. The profit impact of marketing strategy (PIMS) research found that firms with a larger market share increase the amount of profit that the firms earn (Buzzell and Gale, 1987). The leading firm can set the price in the industry, and followers have little chance of taking over the lead (Chu et al., 2007), thus allowing the leading firm to continue to control the market. Firms with a large market share have various advantages, including economies of scale, market power, and quality of management (Buzzel et al., 1975; MacMillan et al., 1982; Smirlock, 1985; Oustapassids et al., 2000). These advantages urge firms to expand their market share and maintain their profits constantly.

However, some researchers have argued that the positive relationship between market share and profit does not always hold. Woo (1981) and Woo and Cooper (1981, 1982) indicate that firms with a low market share have higher profits. Newton (1983) and Hergert (1984) and Shanklin (1988) find that there is no significant relationship between market share and profit. Jacobson (1988) and Schwalbach (1991) note that market share does not have a relationship with profit.

The study, delves into the relationship between market share and profit. The study employed the advanced panel threshold regression model pioneered by Hansen (1999), which has the capability of not only testing the relationship between market share and profit but also calculating the threshold value of the market share. According to the market share threshold, the study empirically tests the different relationships between market share and profit. Firms can use the results to adopt different strategies in creating maximum profits. This empirical study makes some important contributions to this line of research. First, the study expands upon the understanding of the relationship between market share and profit by resolving the methodological problems inherent in previous research. In previous correlation analyses, certain predictable factors have been ignored. Although multiple regression models have been employed to solve these problems, previous studies have not considered the time factors, which not only gave rise to the problem of low power in the testing process but also resulted in biased parameter estimates. To increase power in the testing, the study use an advanced panel threshold regression model that enables us to determine the threshold effect of the market share and identify the three “regimes” demarcating the positive and negative profit rewards. Second, several valuable and practical policy implications also emerge from the results. Managers can benefit considerably by understanding the relationship between market share and profit of their firms. Furthermore, managers can take different strategies according to the relationships derived from these models. This model can be applied at

Table 1. Summary statistics of variables from 1998 – 2008.

Variable	Mean	Std. dev.	Max.	Min	J-B
Operating profit margin	4.009	10.722	51.850	-87.820	7216.92***
Market share	0.095	0.110	0.70	0.0003	2286.33***
Marketing intensity	0.067	0.080	2.111	0.000	2144075***
Management intensity	0.035	0.027	0.506	0.000	170665***
R&D intensity	0.024	0.040	0.911	0.000	2168427***

J-B denotes the Jarque-Bera Test for Normality. ***, ** and * indicate significance at the 0.01, 0.05 and 0.1 level, respectively.

the firm level as firms are able to compute their own threshold value of the market share using internal data from all businesses in their company.

LITERATURE REVIEW

Previous studies have found that there are four kinds of relationships between market share and profit: Positive, negative, nonlinear, and no relationship. Most researchers view market share as a guarantee of profit; thus, increasing the market share is the best policy. Studies of PIMS indicate that the reasons that influence a significant positive relationship include economies of scale, market power, and quality of management (Shepherd, 1972; Shoefflern and Heany, 1974; Buzzell et al., 1975; Rumelt and Wensley, 1981; MacMillan et al., 1982; Smirlock, 1985).

On the contrary, some researchers have different opinions. They point out the insignificant relationship (Newton, 1983; Herhert, 1984; Shanklin, 1988) or spurious relationship (Bourantas and Mandes, 1987) between market share and profit. Jacobson (1988) and Schwalbach (1991) consider that there is no relationship between market share and profit. Gale (1972) and Shepherd (1972) state that the relationship between market share and profit is nonlinear. Gale (1972) indicates that the relationship is convex U-shape curve, whereas Shepherd (1972) believes that the relationship is a weak convex U-shape curve. Gale and Buzzell (1987) use 2800 firms from the PIMS database and find that the relationship between ROI and market share is a flat concave curve from the origin point. Previous studies always use cross section data that ignore the time factor; hence, to increase power in the testing, the study used an advanced panel threshold regression model that enables us to determine the threshold effect of market share and identify the two “regimes” demarcating the placement of positive and negative market share rewards.

DATA

The study employs the advanced panel threshold regression model pioneered by Hansen (1999). This model has the capability of not only testing the relationship between market share and profit but also of calculating the threshold value of the market share.

The source of the data is the Taiwan Economics Journal (TEJ). Data from TEJ are classified by different industries. This study includes 19 industries: motherboard, notebook, printed circuit, scanner, semiconductor, IC packing turnkey provider, plastics, spin and weave, monitor, clothes, food, chemistry, medical treatment, glass, paper, steel, rubber, and motor vehicle industries. The study used quarterly data of the total sales in the period of 1998 – 2008 to compute the market share, firm profit, R&D intensity, marketing intensity, and management intensity. Market share is defined as the Total Salesi,t/Total Sales in the industry (MSi,t). To fit the accepted standard of balanced panel data, the study uses 101 companies in the dataset.

The study adopted operating profit margin as the proxy to measure firm performance, market share as the explanatory variable, and R&D intensity (RandD expenditure/sales revenue), marketing intensity (sales expenditure/sales revenue), and management intensity (management expenditure/sales revenue) as the three variables to analyze the relationship between profit and market share. Control variables can isolate the effects of other factors with a predictable influence on firm profit.

Table 1 provides the descriptive statistics of all the variables in the model. The Jarque-Bera test results indicate that the datasets for all variables are approximately non-normal.

METHODOLOGY

Hansen’s (1999) advanced panel threshold regression model is an extension of the traditional least squared estimation method. To avoid the spurious regression problem, all variables considered in the model must be stationary. Therefore, before using the panel threshold regression model, the study proceeds with the unit root tests. If the null hypothesis of a unit root is mostly rejected, the findings from these stationary tests will enable us to go further and estimate the panel threshold regression model.

In estimating the panel threshold regression model, the study first tests whether there is a threshold. If the study cannot reject the null hypothesis, the threshold effect does not exist. However, the existence of the nuisance problem would mean that the testing statistics follows a non-standard distribution frequently referred to as the Davies’ problem (Davies, 1977, 1987). Hansen (1999) suggests a bootstrap method that utilizes simulations to calculate the asymptotic distribution of testing statistics and tests the significance of the threshold effect. When the null hypothesis does not hold, it means that the threshold effect does exist. Chan (1993) and Hansen (2000) demonstrate that the ordinary least squares (OLS) estimation of the threshold is super-consistent and derives an asymptotic distribution.

However, the non-standard characteristic caused by the nuisance problem means that the asymptotic distribution cannot be used in the statistical inference. Hansen (1999) suggests using a simulation likelihood ratio test to derive the asymptotic distribution of the testing statistics for the threshold and a two-stage OLS method to estimate the panel threshold model.

In the first stage, for any given threshold (γ), the sum of the squared errors (SSE) is computed separately. In the second stage, using the figures calculated in the first stage, the estimation of $(\hat{\gamma})$ is obtained by minimizing the sum of the squares. In the final stage, the estimated threshold value is used to estimate the coefficients of each regime.

Model

The studies construct the single threshold model as follows:

$$p_{it} = \begin{cases} \mu_i + \theta' h_{it} + \beta_1 d_{it} + \varepsilon_{it} & if \quad d_{it} \le \gamma \\ \mu_i + \theta' h_{it} + \beta_2 d_{it} + \varepsilon_{it} & if \quad d_{it} > \gamma \end{cases}, \quad (1)$$

$$\theta = (\theta_1, \theta_2, \theta_3)', \; h_{it} = (m_{it}, s_{it}, c_{it})'$$

where p_{it} represents the proxy variables of the performance of the firm, that is ROA, ROE, and net profit growth rate; d_{it} or the R&D intensity is the explanatory variable and threshold variable; and γ is the specific estimated threshold value. To isolate the effects of other factors with predictable influences on firm performance, the study incorporate the three control variables (h_{it}): m_{it}, marketing intensity; s_{it}, firm size; and c_{it}, capital structure. μ_i is the fixed effect and represents the heterogeneity of firms under different R&D intensities.

The error term ε_{it} is assumed to be independent and distributed identically with mean zero and finite variance σ^2 ($\varepsilon_{it} \sim iid(0, \; \sigma^2)$); i represents different firms; and t represents different periods.

The advanced threshold regression model (1) can be rewritten as follows:

$$p_{it} = \mu_i + \theta' h_{it} + \beta_1 d_{it} I(d_{it} \le \gamma) + \beta_2 d_{it} I(d_{it} > \gamma) + \varepsilon_{it}, \quad (2)$$

where I(•) represents the indicator function. Equation (2) can also be written as

$$p_{it} = u_i + \theta' h_{it} + \beta' d_{it}(\gamma) + \varepsilon_{it}, \; \beta = (\beta_1, \beta_2)'$$

$$p_{it} = \mu_i + [\theta', \beta'] \begin{bmatrix} h_{it} \\ d_{it}(\gamma) \end{bmatrix} + \varepsilon_{it}$$

$$p_{it} = \mu_i + \omega' d_{it}(\gamma) + \varepsilon_{it}, \quad (3)$$

$$d_{it}(\gamma) = \begin{bmatrix} d_{it} I(d_{it} \le \gamma) \\ d_{it} I(d_{it} > \gamma) \end{bmatrix}$$

where $\omega = (\theta', \beta')'$ and $d_{it} = (h_{it}', d_{it}'(\gamma))'$.

The observations are divided into two regimes depending on whether the threshold variable d_{it} is smaller or greater than the threshold value (γ). The regimes are distinguished by different regression slopes, β_1 and β_2. The study use the known p_{it} and d_{it} to estimate the parameters (γ, β, θ and σ^2).

Estimations

The study takes the average of Equation (3) over the time index (t) to derive the following:

$$\bar{p}_i = u_i + \beta' \bar{d}_i(\gamma) + \bar{\varepsilon}_i, \quad (4)$$

where $\bar{p}_i = \frac{1}{T}\sum_{t=1}^{T} \bar{p}_{it}$; $\bar{d}_i(\gamma) = \frac{1}{T}\sum_{t=1}^{T} d_{it}(\gamma)$; and $\bar{\varepsilon}_i = \frac{1}{T}\sum_{t=1}^{T} \varepsilon_{it}$.

The difference between Equations (3) and (4) yields

$$p_{it}^* = \beta' d_{it}^*(\gamma) + \varepsilon_{it}^*, \quad (5)$$

where $p_{it}^* = p_{it} - \bar{p}_i$; ss; and $\varepsilon_{it}^* = \varepsilon_{it} - \bar{\varepsilon}_i$.

Let

$$p_i^* = \begin{bmatrix} p_{i2}^* \\ \vdots \\ p_{iT}^* \end{bmatrix}; \; d_i^*(\gamma) = \begin{bmatrix} d_{i2}^*(\gamma)' \\ \vdots \\ d_{iT}^*(\gamma)' \end{bmatrix}; \text{and } \varepsilon_i^* = \begin{bmatrix} \varepsilon_{i2}^* \\ \vdots \\ \varepsilon_{iT}^* \end{bmatrix}.$$

Then, let $G^*, D^*(\gamma)$, and e^* denote the data stacked over all individual firms.

$$G^* = \begin{bmatrix} y_1^* \\ \vdots \\ y_i^* \\ \vdots \\ y_n^* \end{bmatrix}; \; D^*(\gamma) = \begin{bmatrix} x_1^*(\gamma) \\ \vdots \\ x_i^*(\gamma) \\ \vdots \\ x_n^*(\gamma) \end{bmatrix}; \text{and } e^* = \begin{bmatrix} \varepsilon_1^* \\ \vdots \\ \varepsilon_i^* \\ \vdots \\ \varepsilon_n^* \end{bmatrix}.$$

The study use this notation, and thus Equation (5) is equivalent to

$$G^* = D^*(\gamma)\beta' + e^*. \quad (6)$$

Equation (6) is the major estimation model for the threshold effect.

For any given γ, the slope coefficient β can be estimated from the ordinary least squares (OLS). That is,

$$\hat{\beta}(\gamma) = \left(D^*(\gamma)' D^*(\gamma)\right)^{-1} D^*(\gamma)' G^* . \quad (7)$$

The vector of the regression residuals is

$$\hat{e}^*(\gamma) = G^* - D^*(\gamma)\hat{\beta}(\gamma) . \quad (8)$$

The SSE is

$$SSE_1(\gamma) = \hat{e}^*(\gamma)' \hat{e}^*(\gamma) = G^{*'}\left(I - D^*(\gamma)'\left(D^*(\gamma)' D^*(\gamma)\right)^{-1} D^*(\gamma)'\right) G^* \quad (9)$$

Chan (1993) and Hansen (1999) suggest using the least squares to estimate γ. The study minimizes the concentrated sum of the squared errors Equation (9). Hence, the least squares estimator of γ is

$$\hat{\gamma} = \arg\min_{\gamma} SSE_1(\gamma). \quad (10)$$

Once the study obtain $\hat{\gamma}$, the slope coefficient estimate is $\hat{\beta} = \hat{\beta}(\hat{\gamma})$. The residual vector is $\hat{e}^* = \hat{e}^*(\hat{\gamma})$, and the estimator of the residual variance is

$$\hat{\sigma}^2 = \hat{\sigma}^2(\hat{\gamma}) = \frac{1}{n(T-1)} \hat{e}^{*'}(\hat{\gamma}) \hat{e}^*(\hat{\gamma}) = \frac{1}{n(T-1)} SSE_1(\hat{\gamma}), \quad (11)$$

where n is the number of firms in the sample, and T denotes the sample period.

Testing for a threshold

The study, hypothesize that there is a threshold effect between RandD intensity and firm performance. When R&D intensity is less than the threshold value, the firm performance improves with increasing R&D investment. However, once R&D intensity is over the threshold value, further increasing R&D expenditure does not reap positive rewards. Of course, determining whether the threshold effect is statistically significant is important. The null and alternative hypotheses can be represented as follows:

$$\begin{cases} H_0 : \beta_1 = \beta_2 \\ H_1 : \beta_1 \neq \beta_2 \end{cases} .$$

When the null hypothesis holds, the coefficient $\beta_1 = \beta_2$ means the threshold effect between R&D intensity and firm performance does not exist. However, when the alternative hypothesis holds, the coefficient $\beta_1 \neq \beta_2$ means that the threshold effect does exist.

Under the null hypothesis of no threshold, the model is

$$p_{it} = u_i + \theta' h_{it} + \beta' d_{it}(\gamma) + \varepsilon_{it} . \quad (12)$$

After performing the fixed-effect transformation, the study obtains the following:

$$p_{it}^{\ *} = \beta_1' d_{it}^{\ *}(\gamma) + \varepsilon_{it}^{\ *} . \quad (13)$$

The study then uses the OLS to estimate the regression parameters and obtain the estimated $\tilde{\beta}_1$, estimated residuals $\tilde{\varepsilon}_{it}^{\ *}$, and the sum of the squared errors $SSE_0 = \tilde{\varepsilon}^{*'} \tilde{\varepsilon}^*$.

Hansen (1999) proposes using the F-test to test the existence of the threshold effect and using the sup-Wald statistic to test the null hypothesis. Thus,

$$F = \sup F(\gamma), \quad (14)$$

and

$$F(\gamma) = \frac{(SSE_0 - SSE_1(\hat{\gamma}))/1}{SSE_1(\hat{\gamma})/n(T-1)} = \frac{SSE_0 - SSE_1(\hat{\gamma})}{\hat{\sigma}^2} . \quad (15)$$

Under the null hypothesis, some coefficients (for example the pre-specified threshold value γ) do not exist; therefore, the nuisance problem exists. Davies (1977, 1987) argue that the Davies' Problem causes the F-statistic to have a non-standard distribution. Hansen (1996) recommends a bootstrap procedure to obtain the first-order asymptotic distribution. Thus, the study computes the p-value of the F-test to determine if the null hypothesis must be rejected or not. Using the bootstrap sample, the study estimates the model under the null (Equation 13) and alternative (Equation 5) hypotheses and calculates the bootstrap value of the likelihood ratio statistic $F(\gamma)$ (Equation 15). The studies repeat this procedure several times and calculate the percentage of draws where the simulated statistic exceeds the actual statistic. Hence,

$$P = P\left(\tilde{F}(\gamma) > F(\gamma) \middle| \zeta\right), \quad (16)$$

where ζ is the conditional mean of $\tilde{F}(\gamma) > F(\gamma)$.

This is the bootstrap estimate of the asymptotic p-value for $F(\gamma)$ under H_0. The null hypothesis of no threshold effect is rejected if the p-value is smaller than the desired critical value.

Asymptotic distribution of the threshold estimate

Chan (1993) and Hansen (1999) show that when the threshold effect exists, that is when $\beta_1 \neq \beta_2$, then $\hat{\gamma}$ is consistent for γ_0. Hansen (1999) suggests that the best way to formulate confidence intervals for γ is to form the "no-rejection region" using the likelihood ratio statistic for tests on γ. According to Hansen (1999), when $LR_1(\gamma_0)$ is large enough, and the p-value is beyond the confidence interval, the null hypothesis is rejected. To test the hypothesis,

$$\begin{cases} H_0 : \gamma = \gamma_0 \\ H_1 : \gamma \neq \gamma_0 \end{cases} ,$$

the likelihood ratio statistic for the test is

$$LR_1(\gamma) = \frac{SSE_1(\gamma) - SSE_1(\hat{\gamma})}{\hat{\sigma}^2} . \quad (17)$$

Table 2. Panel unit root test results.

Variable	Levin, Lin and Chu	Im, Pesaran and Shin W-stat
Operating profit margin	-14.772***	-16.176***
Market share	-7.507***	-4.494***
Marketing intensity	-9.721***	-13.340***
Management intensity	-13.243***	-13.804***
R&D intensity	-7.678***	-9.488***

Standard denotes standard deviation and J-B denotes the Jarque-Bera Test for Normality. ***, ** and * indicate significance at the 0.01, 0.05 and 0.1 level, respectively.

According to Hansen (1999), when the null hypothesis $H_0 : \gamma = \gamma_0$ cannot be rejected and some specific assumptions are fit, then

$$LR_1(\gamma) = d\zeta , \tag{18}$$

and ζ is a random variable with a distribution function, and when $n \to \infty$, then

$$P(\zeta \le x) = \left(1 - \exp\left(-x/2\right)\right)^2 . \tag{19}$$

The studies compute the likelihood ratio and estimate the asymptotic p-value. The distribution function (18) can be rewritten as follows:

$$c(\alpha) = -2\log\left(1 - \sqrt{1-\alpha}\right) , \tag{20}$$

Making it is easy to calculate the critical values. For a given asymptotic level α, the null hypothesis $\gamma = \gamma_0$ is rejected if $LR_1(\gamma)$ exceeds $c(\alpha)$.

Multiple threshold model

In empirical studies, there are some cases where there is more than one threshold. If there are double thresholds, the model is modified as

$$p_{it} = u_i + \theta_i' h_{it} + \beta_1' d_{it} I(d_{it} \le \gamma_1) + \beta_2' d_{it} I(\gamma_1 < d_{it} \le \gamma_2) + \beta_3' d_{it} I(d_{it} > \gamma_2) + \varepsilon_{it} \tag{21}$$

Equation (21) can be represented as:

$$p_{it} = \begin{cases} u_i + \theta_i' h_{it} + \beta_1' d_{it} + \varepsilon_{it} & \text{if} \quad d_{it} \le \gamma_1 \\ u_i + \theta_i' h_{it} + \beta_2' d_{it} + \varepsilon_{it} & \text{if} \quad \gamma_1 < d_{it} \le \gamma_2 \\ u_i + \theta_i' h_{it} + \beta_3' d_{it} + \varepsilon_{it} & \text{if} \quad \gamma_2 < d_{it} \end{cases} , \tag{22}$$

Where the threshold value, $\gamma_1 < \gamma_2$. This can be extended to the multiple threshold model ($\gamma_1, \gamma_2, \gamma_3, \cdots \gamma_n$).

EMPIRICAL RESULTS

This research employs Hansen's (1999) advanced panel threshold model to analyze the threshold effect between market share and profit as well as to examine the possible asymmetric non-linear relationship between them fully. Before the study used the panel data in the statistical analysis, it tests whether the datasets are stationary. If this condition is not met, a spurious regression problem may arise, and the estimated parameters can become biased. The study, employ two different panel-based unit root tests, namely, the Levin-Lin-Chu ADF (Levin et al., 2002) and the IPS ADF (Im et al., 2003), to examine the null of a unit root of all the variables chosen in the models for the sample of 101 firms in Taiwan. The results of both unit root tests are reported in Table 2. There is no doubt that all the variables are stationary, that is I(0). Thus, the studies proceed with the full analysis.

The study follows the bootstrap method to obtain the approximations of the F-statistics and calculate the p-values. Table 3 presents the empirical results of both the single and double threshold tests. After repeating the bootstrap procedures 200 times for each of the two panel threshold tests, the study find that the p-values of the profit are significant with both the single and double threshold models. The empirical results confirm that market share has a significant double threshold on profit. Clearly, the mystery surrounding the unlimited expansion in market share is solved: firms can choose their best policy on market share. Table 4 presents the estimated coefficients between profit and market share. The coefficients of market share are -0.0371 when the market share is less than the threshold value 0.254, whereas profit is negative when the market share is larger. The threshold serves as the turning point demarcating the three contrasting effects of market share on profit. The estimated model from the above empirical findings can be expressed as follows:

Table 3. Tests for the threshold effects between market share and profit.

	F	p-value
Single Threshold Effect Test	38.094***	0.000
Threshold value (10%, 5%, 1%)	(21.021, 22.157, 24.013)	
Double Threshold Effect Test	1279.68 ***	0.000
Threshold value (10%, 5%,1%)	(160.932, 174.308, 219.926)	

F-Statistics and P-values are from repeating the bootstrap procedures 200 times for each of the two bootstrap tests. ***, ** and * indicate significance at the 1, 5 and 10% level, respectively.

Table 4. Estimated coefficients of the control variables.

	Estimated value	95% Confidence Intervals			
Threshold value γ_1	0.670	[0.561, 2.500]			
Threshold value γ_2	0.254	[0.093, 0.254]			
	Estimated Value	OLS se	t_{OLS}	White se	t_{White}
Coefficients β_1	-0.0371	0.0251	-1.4782	0.0053	-6.9175***
Coefficients β_2	9.689	0.2731	35.472***	0.6201	15.624***
Coefficients β_3	-0.0255	0.0135	-1.8888	0.0032	-7.968***

***, ** and * indicate significance at the 1, 5 and 10% level, respectively.

$$g_{it} = \mu_i - \underset{(0.0135)}{0.0255} d_{it} I(q_{it} \le \hat{\gamma}_1) + \underset{(0.2731)}{0.689} d_{it} (\hat{\gamma}_1 < q_{it} \le \hat{\gamma}_2) - \underset{(0.0251)}{0.0371} d_{it} I(\hat{\gamma}_2 < q_{it} \le \hat{\gamma}_3) + \theta' h_{it} + \varepsilon_{it} \tag{23}$$

Equation (23) can be represented as

$$g_{it} = \begin{cases} \mu_i + \theta' h_{it} + \beta_1 d_{it} + \varepsilon_{it} & if \quad q_{it} \le 0.254 \\ \mu_i + \theta' h_{it} + \beta_2 d_{it} + \varepsilon_{it} & if \quad 0.254 < q_{it} \le 0.670 \\ \mu_i + \theta' h_{it} + \beta_3 d_{it} + \varepsilon_{it} & if \quad 0.670 < q_{it} \end{cases}$$

The study uses three control variables to capture the potential impact of firm size, marketing intensity, management intensity, and R&D intensity of the firm. Table 5 shows that marketing intensity has a significantly negative effect on firm profit.

Conclusions

This paper employs the advanced panel threshold regression model to investigate the panel threshold effect of market share on firm profit among publicly traded firms in Taiwan. The study uses market share as the threshold variable and marketing intensity, management intensity, and R&D intensity as the control variables. The results indicate a double threshold effect among publicly traded firms in Taiwan. The coefficient is negative when the market share is less than the threshold value 0.254, indicating that enlarging the market share does not enhance profit. Firm's market share in this area needs to adopt differentiation strategy and avoids price competition. The coefficient is positive when the market share is above the threshold value of 0.254 and less than the threshold value of 0.670, signifying that, in that regime, expanding the market share will allow firms to obtain more profit. The coefficient is negative when the market share is more than the threshold value of 0.670, indicating that a sufficiently large market share cannot enhance profit. By and large, market share should not

Table 5. Estimated coefficients of the control variables.

	Estimated value	OLS se	t_{OLS}	White se	t_{White}
Coefficients θ_1	-0.02304	0.01195	-1.92803	0.00311	-7.4083***
Coefficients θ_2	-0.00701	0.01194	-0.58710	0.00844	-0.8305
Coefficients θ_3	0.00052	0.01139	0.04565	0.00330	0.1575

$\hat{\theta}_1$、$\hat{\theta}_2$、$\hat{\theta}_3$及represent the estimated coefficients: marketing intensity, management intensity and R&D intensity. ***, ** and * indicate significance at the 1, 5 and 10% level, respectively.

expand unlimitedly, which means that firms need to have a position strategy when their market shares are less than threshold value of 0.245 and more than threshold value of 0.670. On the contrary, firms can increase their market share and obtain positive rewards when the market share value is between 0.254 and 0.670.

There are valuable practical policy implications that emerge from the results of the study that managers can considerably benefit from. With the market share threshold values, managers can determine the optimal market share strategy based on different market shares by calculating the threshold values using the models developed here. Simply put, the model provides a concrete foundation on which managers can base their decisions when they allocate market share resources in diversified development opportunities.

To this end, the study offer some suggestions for further research on the relationship between market share and firm profit. Firms should depend on their resource conditions when taking the best market share strategy instead of enlarging their market share without considering other factors (Bourantas and Mandes, 1987). Shanklin (1988) considers market share to be related closely to profit. For this reason, firms need to deliberate on their resource and industry features when creating their market share strategies. The strategy of "the bigger the better" in terms of facing the competition will reduce profit.

In this research, the relationship between market share and profit is both positive and negative due to different market share threshold values. When the market shares of firms are less that the first threshold value, the relationship between market share and profit is negative; thus, firms looking to expand their market share cannot gain more profits if they do not consider their differentiation strategy. Firms can use their unique and core capability to create added value (Hamermesh et al., 1978; Woo, 1981; Woo and Cooper, 1981, 1982). When the market shares of firms are more than the first threshold value and less than the second threshold value, the market share of the firms become large enough to have economies of scale, market power, and quality of management effect, indicating that the relationship between market share and profit is significantly positive (Shepherd, 1972; Shoefflern and Heany, 1974; Buzzell et al., 1975; Rumelt and Wensley, 1981; MacMillan et al., 1982; Smirlock, 1985). The more market share firms have, the more profits they earn. Therefore, the best strategy for firms is to expand their market share. "The bigger the better" is the best strategy for those firms. However, when the market shares are too big for the economies of scale effect, the relationship between market share and profit becomes negative, and expanding the market share of the firm would be a wasted strategy.

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