

# **Competitive Accounting as A Strategic Management Accounting Approach: Empirical Evidence from Food Product Businesses in Thailand**

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## **ABSTRACT**

The objective of this study is to examine the influences of competitive accounting on marketing performance of food product businesses in Thailand. Competitive accounting includes product-centered accounting, customer-oriented accounting, competitor-focused accounting, and market-concentrated accounting. In addition, this study investigates the mediating influences of marketing advantage and the moderating influences of technology capability on the research relationships. In this study, 456 food product businesses in Thailand are the samples of the study. Both structural equation model and multiple regression analysis are implemented to test the direct and indirect influences. The findings suggest that all dimensions of competitive accounting significantly influence marketing advantage, but only competitor-focused accounting has an important influence on marketing performance. In addition, marketing advantage is a key determinant of marketing performance and it also plays a critical mediating role in driving the research relationships. Next, technology capability is a moderator of the relationships. In summary, competitive accounting is an important valuable strategic tool in promoting firms to obtain sustainable business competitiveness and achieve outstanding organizational performance in future and long-term aspect. Therefore, firms need to learn, understand, invest, and utilize a competitive accounting concept in order to enhance their growth, survival and sustainability.

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*Keywords: competitive accounting; marketing advantage; technology capability; marketing performance*

## I. INTRODUCTION

Nowadays, the intensity, strength, and vigor of competitive markets and environments have created fast-changing business operations, activities, and practices which have influenced all firms. Firms have realized the need and want to explore, exploit, mobilize, and deploy valuable strategies and techniques in order to stay competitive in the changing business markets and environments (Quaye and Mensah, 2019). Successful, valuable strategies and techniques can help them achieve outstanding business performance and obtain organizational sustainability in future and long-term aspect. Accordingly, firms need to create effective strategic tools in order to develop new products and services, respond to customer requirements and expectations, overcome competitor capabilities and competencies, and understand competitive markets and environments. To successfully apply the effective strategic tools in business operations, firms need to comprehend and integrate learning, knowledge and experience of accounting-marketing synergy and interface in order to enhance sustainable competitiveness and encourage long-term profitability and sustainability (Opute and Madichie, 2017). The accounting-marketing synergy and interface becomes an important source of competitive advantage and performance. It is a key driver of firms' success, growth, survival, and sustainability, and its concept is called "competitive accounting."

Competitive accounting is an application of accounting knowledge and capability in creating firms' competitive advantage and potentiality which enhance their business performance in the future and long-term operations. It plays a significant role in driving, determining, and explaining their competitive advantage and performance in a rigorous, complex business market and environment. In addition, competitive accounting is one of firms' internal processes that can assist to succeed, survival, and sustain in turbulent markets and environments. It is defined as a kind of strategic management accounting system that can support firms to access and use necessary accounting information to achieve their objectives and consequently improve their performance (Ghasemi et al., 2015). It can increase their quality of information to improve their decision-making and productivity, and create their valuable strategies and techniques to achieve potential competitive advantage and competitiveness and obtain outstanding performance and success in future and long-term operations (Mia and Winata, 2014). Firms can respond to these challenges by rearranging their work processes. They can formulate new strategies that are strongly product-centered, customer-oriented, competitor-focused, and market-concentrated. Accordingly, competitive accounting can drive their sustainable competitive advantage and long-term profitability, and success. It has firms move toward effectiveness, control, market analysis, quality assessment, customer satisfaction, and competitive status management (Abdel-Maksoud et al., 2012). Therefore, firms can determine the design of competitive accounting in an organization and can also lead to firms' needs to re-evaluate their current organizational designs, strategies, and techniques to cope with the uncertainty in the competitive environment.

Currently, marketing advantage is a critical result of competitive accounting implementation. It is defined as a set of processes, activities, or practices that seek to discover the desires of customers and develop a range of products or services that satisfy their desires and achieve profits for a firm within a reasonable period (Shahbaz et al., 2022). It encloses a superior marketplace position in which the provision of customer value and the achievement of lower relative costs are superior to the competition.

Therefore, effective marketing advantage is a major result of competitive accounting, and it also plays a significant role in driving and determining firms' marketing performance, success, survival, and sustainability. In addition, marketing performance is a valuable consequence of competitive accounting application. It refers to the effectiveness, efficiency, and productivity of marketing operations, activities, and practices with regard to market-related objectives and goals (Paolone et al., 2022). Accordingly, marketing performance is a success of competitive accounting implementation, and it is also a critical outcome of potential marketing advantage usefulness.

To strengthen the research relationships, technology capability is an ability of firms to design and develop new processes, products, and upgrade knowledge and skills about the physical environment in a unique way. It transforms the knowledge into instructions and designs for efficient creation of desired performance (Salisu and Bakar, 2020). It is a competency to be effective in using technology during the transformation process as compared to their competitors. Next, technology capability is a combination of skills, knowledge, experiences, machines, equipment, systems, and procedures that generate a special advantage for a firm to perform technical functions, develop new products and processes, and effectively facilitate the operation of a firm (Al-Mamary et al., 2020). It enables firms to identify, acquire, and apply new external knowledge to develop operational abilities, competencies, and capabilities, which lead to the attainment of superior performance. Therefore, technology capability is hypothesized to strongly promote these relationships.

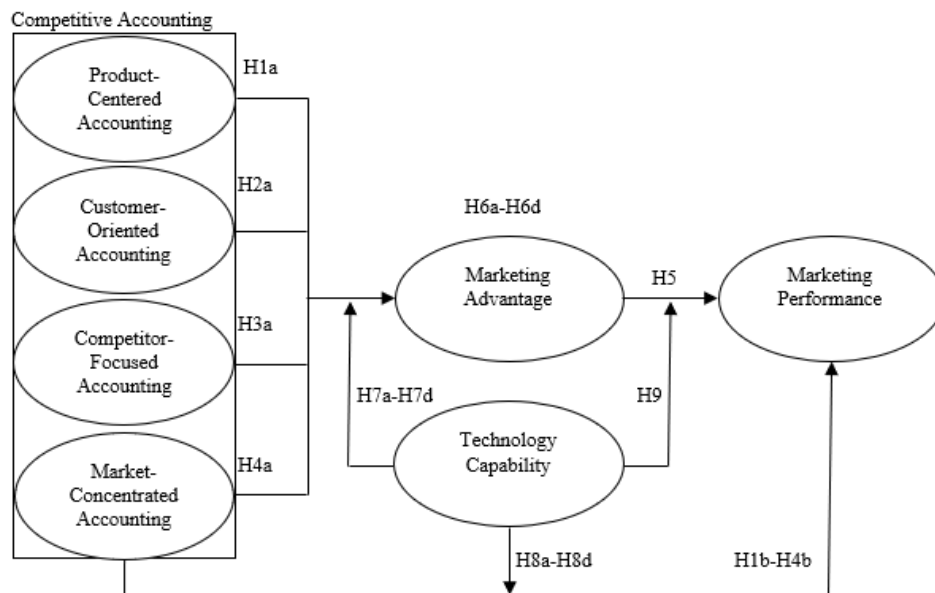
This study aims to investigate the influences of competitive accounting on the marketing performance of food product businesses in Thailand. The key research question is how competitive accounting influences marketing performance. The specific research questions are: (1) How competitive accounting influences marketing advantage, (2) How marketing advantage influences marketing performance, (3) How marketing advantage mediates the competitive accounting-marketing performance relationships, and (4) How technology capability moderates all relationships. In addition, this study collected data from food product businesses in Thailand. They are one of the major industries in a country. Thailand has long been called "the kitchen of the world" with its abundant natural resources, highly-skilled workforce, and strength in research. Next, Thailand enjoys numerous competitive advantages in the food and agricultural industries with abundant natural resources, a year-round growing season, relatively low labor costs, and a skilled workforce. Therefore, Thailand is a top-ten global producer of some important agricultural products, including rice, cassava, sugarcane, palm oil, coconut, pineapple, and natural rubber, and it is the main producer and exporter of several processed foods, including canned tuna, frozen seafood, shrimp, and chicken. Accordingly, food product businesses in Thailand are the appropriate samples for the study

## II. LITERATURE REVIEW

Profit maximization is a process of business firms that undergoes to ensure the best output and price levels are achieved in order to maximize its returns. Influential factors such as sale price, production cost, and output levels are adjusted by the firms as a way to achieve their profit goals. Accordingly, profit maximization theory is employed to verify and clarify the influences of competitive accounting on marketing performance. It

is the principle that every firm should use to make a profit (Lynch, 2000). Profitable firms can achieve this by selling more, charging higher prices for their goods or services, and reducing production costs. In this study, competitive accounting is a valuable strategic tool that helps firms achieve marketing advantage and performance and obtain profit maximization in business operations. Next, marketing advantage, technology capability, and marketing performance are mediating, moderating, and dependent variables of the study, respectively. Figure 1 shows the research model of the research relationships.

**Figure 1**  
A Research Model of the Competitive Accounting-Marketing Performance Relationships



### A. Product-Centered Accounting

Product-centered accounting is defined as management accounting information that is an effective control tool of new product development through a critical sub-process of innovation, encapsulating all of the activities associated with developing a new product (Feeney and Pierce, 2018). It incorporates a management accounting information system in which all of the activities necessary to complete a new product project from idea to launch are marked by clear decision-making requirements. Both formal and informal uses of product-centered accounting can help firms provide an appropriate balance of firmness and flexibility required to govern the new product development process. In addition, product-centered accounting is an accounting tool for decisions on the future survival of product development and innovation projects to meet firms' targets (Lind, 2017). Firms can apply product-centered accounting to guide their choices for the courses of action in the product innovation process and mobilize internal and external support and resources through guiding a search for new product solutions. Next, product-centered accounting is a process by which firms ensure that resources are obtained and used effectively and

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efficiently in an accomplishment of firms' new product development objectives (Barros and Ferreira, 2019). It focuses on planning, monitoring and measuring all production activities through budgeting control analysis and financially oriented decision analysis. It can enhance product innovation during a planning phase to a further phase to reduce variation and deviation of developed rules (Latifah et al., 2021). Then, product-centered accounting can provide accounting information which is served as part of management control, that is a central part of internal decision-making and firms' strategic measures in their product innovation process. Firms can provide and achieve accounting information that links to an adoption of a new idea or behavior in implementing new product development projects in an organization (Fagerlin and Löfstål, 2020). Best product-centered accounting can respond to customer needs, beat major competitors competencies, and compete business markets. Accordingly, product-centered accounting is positively to influence both marketing advantage and marketing performance. Therefore,

*H1: Product-centered accounting positively influences (a) marketing advantage and (b) marketing performance.*

## **B. Customer-Oriented Accounting**

Customer-oriented accounting refers to all accounting practices directed towards appraising profit, sales, or present value of earnings relating to a customer or group of customers (Ng and Wood, 2018). It comprises a collection of techniques that identify, measure, communicate, and report information related to individual customers or customer groups, namely (1) customer profitability analysis, (2) customer segment profitability analysis, (3) lifetime customer profitability analysis, and (4) customer valuation analysis. Next, customer-oriented accounting is a process of identifying, measuring, communicating, and reporting economic information relating to a customer or customer group (McManus, 2013). It is designed to create transparency regarding the revenues and costs involved in handling customer relationships across customer-related functions. It can facilitate resource allocation decisions regarding which customers to target and how to differentiate activities, such as direct marketing investments, credit terms, sales force activities, customer service activities, and delivery terms across customer relationships. It is a strategically-oriented management technique linked with competitive advantage by focusing on the financial measurement of customers (Oyewo et al., 2020). In addition, customer-oriented accounting is a source of firms' competitive advantage that delivers superior financial returns, which are sustainable over the long term (Holm et al., 2016). Firms can help increase market share, customer loyalty, customer retention, and customer satisfaction. They can improve sustainable competitiveness and competitive advantage, leading to achieve profitability, shareholder value creation, market share, and customer patronage in the long run. Accordingly, customer-oriented accounting is hypothesized to positively influence marketing advantage and marketing performance. Therefore,

*H2: Customer-oriented accounting positively influences (a) marketing advantage and (b) marketing performance.*

### C. Competitor-Focused Accounting

Competitor-focused accounting is defined as the analysis of information from accounting issues related to competitors, to gain detailed insight into their present cost and financial position, to determine one's own competitive position, and to predict the future strategic behavior of the competitors (Usman and Bello, 2019). It is directed towards understanding the behaviors of the competition while giving information about the most important competitors and their aims, main advantages and disadvantages, and business results (Sinisa and Nikolina, 2017). It is a strategic process of recording, analyzing, and presenting formal competitors' financial and non-financial information and assessing the amount and the structure of cost of competitors, observation of their market position as well as analyzing the competition based their financial reports. In addition, competitor-focused accounting provides detailed insight into a competitor's present cost and financial situation, determining one's own competitive position and predicting future competitive strategic behaviors (Chiekezie et al., 2014). It comprises (1) competitor position monitoring, (2) competitor cost assessment, and (3) competitor financial statement performance appraisal (Ojra et al., 2021). It creates a relevant and accurate information base for making the right strategic decision and achieving performance. Firms can provide management planning and control, with detailed attention paid to each competitor's resources, objectives, and competitive stance according to its competitive position, cost structure, and performance result (Oyewo, 2021). They can identify their competitors' strengths and weaknesses, making them more able to counter their competitors to their competitive advantage and performance. Accordingly, competitor-focused accounting is likely to have a positive influence on marketing advantage and performance. Therefore,

*H3: Competitor-focused accounting positively influences (a) marketing advantage and (b) marketing performance.*

### D. Market-Concentrated Accounting

Market-concentrated accounting is defined as a system that generates management accounting information for internal users, which is used for analyzing, learning and utilizing market environments and conditions and adapting the businesses according to observed changes (Nguyen, 2018). It is a mechanism for understanding market and competitive environments and establishing a repository of strategy-attribute information, which is enveloped in the process of generated decision making information for achieving competitive advantage and performance. It is designed to enhance the effectiveness of the decision-making process and the achievement of organizational goals (Ngo, 2021). In addition, market-concentrated accounting is the provision and analysis of management accounting data about a business environment and a market condition, for use in developing and monitoring business strategy. It involves the evaluation of external information regarding marketplace conditions, government regulations and legal policies, industry changes, technology growths, and other environmental factors affecting the market, current trends in prices, share and costs (Özer et al., 2006). It is a key ingredient for effective reaction that can help compete the market environments, conditions and situations and achieve competitive advantage and performance. Firms can

provide effective market environment information gathering and fast reactions to demands to gain valuable marketing competitiveness and receive superior marketing results. They can have more competencies and capabilities in order to compete with these environments and enhance great business results. Accordingly, market-concentrated accounting is hypothesized to positively influence both marketing advantage and marketing performance. Therefore,

*H4: Market-concentrated accounting positively influences (a) marketing advantage and (b) marketing performance.*

### **E. Marketing Advantage**

Marketing advantage is a set of processes, activities, or practices that seek to discover the desires of customers and develop a range of products or services that satisfy their desires and achieve profits for a firm within a reasonable period (Shahbaz et al., 2022). It is the extent of the competitiveness of the operating environment in which a firm operates. It encloses a superior marketplace position in which the provision of customer value and the achievement of lower relative costs are superior to the competition. It is a consequence of better product positioning, promotion, and allocation. Firms can deal with the requirements and demands of customers, regulations, and opportunities (Jain et al., 2020). They can respond to customer needs and wants, compete with competitor competencies and capabilities, and overcome market conditions and competitive environments. Moreover, firms tend to have an edge over competitors in the marketplace by having a superior product, as well as promoting it and distributing it more effectively. By creating products which offer superior gratification, they can gain a competitive edge that may be a result of correctly recognizing customer needs and wants and effectively overcoming competitors' competencies and capabilities. In addition, marketing advantage focuses on the superiority of marketing activities, promotion, marketing mix, marketing strategies, marketing processes, market reach, perception of brand, and other strengths connected to this functional strategy of the corporation (D'Souza and Taghian, 2018). A higher marketing advantage can increase the effectiveness of firms' marketing activities and better enhance their long-term marketing performance and success. Accordingly, marketing advantage is hypothesized to play a significant role in determining marketing performance. To investigate the mediating effects, marketing advantage is a go-between for competitive accounting and marketing performance. In a mediation relationship, firms can apply competitive accounting that links to marketing advantage through utilizing marketing advantage to achieve marketing performance. Then, marketing advantage is also hypothesized to be a moderator of the competitive accounting-marketing performance relationships. Therefore,

*H5: Marketing advantage positively influences marketing performance.*

*H6: Marketing advantage mediates:*

- (a) the product-centered accounting-marketing performance relationships,*
- (b) the customer-oriented accounting-marketing performance relationships,*
- (c) the competitor-focused accounting-marketing performance relationships, and*
- (d) the market-concentrated accounting-marketing performance relationships.*

## F. Technology Capability

Technology capability is the ability of firms to design and develop new processes, products, and upgrade knowledge and skills about the physical environment in a unique way. It transforms the knowledge into instructions and designs for efficient creation of desired performance (Salisu and Bakar, 2020). It includes (1) acquiring new technology through formal or informal channels, (2) operating the technology for use and sustaining production and equipment and facilities, (3) improving products and processes depending on an organization's own strength, (4) adjusting the current product and process parameters according to changing market demands, and (5) upgrading their technology to meet changing market demands. Next, technology capability is defined as a combination of skills, knowledge, experiences, machines, equipment, systems, and procedures that generate a special advantage for a firm to perform technical functions, develop new products and processes, and effectively facilitate the operation of a firm (Al-Mamary et al., 2020). It enables firms to identify, acquire, and apply new external knowledge to develop operational abilities, competencies, and capabilities, which leads to the attainment of superior performance. Firms can develop, assimilate, and apply technological knowledge and competencies to increase their competitiveness, create their long-term competitive advantage, and enhance their performance growth and development (Aydin 2021). In addition, technology capability uses various technologies to perform any relevant technical function or volume activity within their organizations including the ability to acquire, utilize knowledge, and create new knowledge, which underpins core concepts to offer new products (Liao et al., 2020). It contributes to the process of generating and managing technological change, guiding firms to conduct constant improvements in processes, projects, and products, and leading them to compete in the international market (Tello-Gamarra and Fitz-Oliveira, 2021). It can influence their motivation to explore the knowledge and resources, which in turn will make them more outward-looking to search the external technological opportunities and reduce the resistance towards the external resources acquisition process in order to create customer value based on innovativeness. Accordingly, technology capability is hypothesized to affect the strength of the previously mentioned research relationships. Therefore,

*H7: Technology capability moderates*

- (a) the product-centered accounting-marketing advantage relationships,*
- (b) the customer-oriented accounting-marketing advantage relationships,*
- (c) the competitor-focused accounting-marketing advantage relationships,*
- (d) the market-concentrated accounting-marketing advantage relationships.*

*H8: Technology capability moderates*

- (a) the product-centered accounting-marketing performance relationships,*
- (b) the customer-oriented accounting-marketing performance relationships,*
- (c) the competitor-focused accounting-marketing performance relationships,*
- (d) the market-concentrated accounting-marketing performance relationships.*

*H9: Technology capability moderates the marketing advantage-marketing performance relationships.*



### **G. Marketing Performance**

Marketing performance is the effectiveness, efficiency, and productivity of marketing operations, activities, and practices with regard to market-related objectives and goals (Paolone et al., 2022). It includes revenues, growth, market share, sales value, and customers' and channel partners' satisfaction and retention. In addition, marketing performance is a success of firms' marketing operations, activities, and practices (Hamid et al., 2021). It measures the achievement of their marketing objectives and goals through the means according to the surrounding circumstances. In addition, marketing performance is an indicator of success for a profit-oriented organization (Mulyana et al., 2020). It can be improved through meeting customers' needs and desires and increasing market segmentation that links to the way to increase firm profits. Firms can retain customers, attract new customers, increase customer satisfaction, increase sales growth, and increase income. Therefore, marketing performance is a measure of the success of firms' marketing operations, activities, and practices (Hiong et al., 2020). In this study, marketing performance is measured using six variables that assess the extent to which firms realize their marketing-related objectives and goals in terms of increased sales profits, sales growth, an increase in market share, an increase in customer loyalty, an increase in customer satisfaction, and enhanced corporate image and reputation

## **III. RESEARCH METHODOLOGY**

### **A. Data Collection Procedure and Sample Section**

A questionnaire with dichotomous scales was utilized as a key instrument for collecting data. A total of 1,913 key participants from food product businesses in Thailand were contacted (Thailand Food Business Directory, n.d.). The key participants were accounting executives, namely the chief accounting officer, the accounting director, accounting manager, or other accounting executives. They prepared and reviewed appropriate ledger entries and reconciliations, maintained the general ledger system, prepared monthly, quarterly, and annual financial statements as assisting with regulatory reporting as applicable, researched accounting issues for compliance, coordinated the budget process, and hired, trained, and supervised accounting staff. The mailed questionnaire was distributed to these participants. They were requested to complete the questionnaire and return it to the researchers. With regard to the questionnaire distribution, 471 responses were received. Based on the questionnaire, which was completed and returned, 456 were usable. The effective response rate was approximately 23.84%. The response rate for a mailed survey as being greater than 20 was considered acceptable, with an appropriate follow-up procedure suggested by Aaker et al. (2001). Next, verifying potential non-response bias as recommended by Armstrong and Overton (1977), comparison of the first and the second wave data was considered. This study had no response bias problems for testing the research relationships because there were no statistically significant differences between the first and the second groups at a 95% confidence level as a number of year in a business existence ( $t = 0.21$ ,  $p > .05$ ), a number of employee in a firm ( $t = 0.17$ ,  $p > .05$ ) and an amount of invested capital in a business ( $t = 0.23$ ,  $p > .05$ ).

## B. Measurements

Measurements of all constructs (product-centered accounting, customer-oriented accounting, competitor-focused accounting, market-concentrated accounting, marketing advantage, technology capability, and marketing performance) using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) are self-developed from existing literature. A source of measurements is presented in Table 1. Measurements of these constructs are self-developed from existing literature, as shown in Appendix A. In addition, control variables were also investigated. Operational period (OPP) was measured by the number of years a firm has been in existence (Zahra et al., 2000) using a dummy variable as less than 10 years = 0 and equal to or greater than 10 years = 1. Next, employee amount (EMM) was measured by the number of employees in a firm (Arora and Fosfuri, 2000) using a dummy variable, as less than 200 employees = 0 and equal to or greater than 200 employees = 1. Lastly, capital investment (CAI) was measured by the amount of money a firm has invested in doing business (Ussahawanitchakit, 2007) using a dummy variable, as less than 250 million baht = 0 and equal to or greater than 250 million baht = 1.

**Table 1**  
A Summary of Measurements of All Variables

Variables	Items	References
Product-centered accounting (PCA)	5	Barros and da Costa Ferreira (2019); Feeney and Pierce (2018)
Customer-oriented accounting (COA)	5	McManus (2013); Ng and Wood (2018)
Competitor-focused accounting (CFA)	6	Chiekezie et al. (2014); Usman and Bello (2019)
Market-concentrated accounting (MCA)	5	Ngo (2021); Nguyen (2018)
Marketing advantage (MKA)	7	D'Souza and Taghian (2018); Shahbaz et al. (2022)
Technology capability (TNC)	6	Al-Mamary et al. (2020); Salisu and Bakar (2020)
Marketing performance (MKP)	6	Mulyana et al. (2020); Paolone et al. (2022)

## C. Tests of Instrument Quality

To prove factorability, validity, and reliability of the model, factor loadings, Cronbach alpha coefficients, and item-total correlations were examined (Hair et al., 2010). The factor loadings of all items are greater than 0.60. Next, item-total correlations were greater than 0.30, indicating the achievement of the convergent validity. Finally, Cronbach's alpha coefficients as well as the composite reliability were achieved with a score greater than 0.07. In this study, all the indices could be accepted. Table 2 presents the validity and reliability results for multiple-item scales used in this study.

## D. Measurement Model Analysis

According to Awang (2014), the comparative fit index (CFI), the goodness of fit index (GFI), the incremental fit index (IFI), and root mean square error of approximation [https://doi.org/10.55802/IJB.029\(4\).004](https://doi.org/10.55802/IJB.029(4).004)

(RMSEA) as the most important indices of the maximum likelihood estimation, were used to assess the model fit. The measurement model analysis was performed with all constructs included. The model for indices was achieved (CFI = 0.91, GFI = 0.93, IFI = 0.95, and RMSEA = 0.05). Based on the aforementioned important indices, this study could continue further when at least three of the indices meet the threshold requirement (Hair et al., 2010). Accordingly, the initial test of the measurement model results in a good fit to the data.

**Table 2**  
A Summary of Measurements of All Variables

Items	Factor Loadings	Item Total Correlation	Cronbach Alpha
Product-centered accounting (PCA)	0.81-0.84	0.75-0.82	0.76
Customer-oriented accounting (COA)	0.77-0.83	0.80-0.81	0.72
Competitor-focused accounting (CFA)	0.91-0.97	0.91-0.97	0.94
Market-concentrated accounting (MCA)	0.91-0.92	0.91-0.92	0.90
Marketing advantage (MKA)	0.82-0.88	0.79-0.89	0.76
Technology capability (TNC)	0.81-0.91	0.81-0.91	0.90
Marketing performance (MKP)	0.81-0.91	0.82-0.90	0.84

#### E. Statistical Methods of Hypothesis Testing

In this study, the influences of competitive accounting on marketing performance were empirically investigated. Product-centered accounting, customer-oriented accounting, competitor-focused accounting, and market-concentrated accounting were the independent variables of the study. In addition, marketing advantage, technology capability, and marketing performance were the mediating variable, moderating variable, and dependent variable of the study. Thus, a structural equation model was employed to investigate both direct and mediating hypotheses, while multiple regression analysis was applied to test the moderating hypotheses. The results of this study are presented in the next section.

### IV. RESULTS AND DISCUSSION

**Table 3**  
Descriptive Statistics and Correlation Matrix

Variables	PCA	COA	CFA	MCA	MKA	TNC	MKP
Mean	4.18	4.17	4.09	3.94	4.04	4.06	4.05
s.d.	0.60	0.40	0.65	0.65	0.56	0.59	0.59
PCA							
COA	0.43***						
CFA	0.43***	0.66***					
MCA	0.41***	0.45***	0.41***				
MKA	0.45***	0.34***	0.35***	0.73***			
TNC	0.59***	0.50***	0.58***	0.47***	0.47***		
MKP	0.51***	0.42***	0.49***	0.72***	0.75***	0.52***	

Note: \*\*\*  $p < .01$

Table 3 presents the descriptive statistics and correlation matrix for all variables. According to Hair et al. (2010), multicollinearity might occur when intercorrelation in each predictor variable is more than 0.80, which suggests a strong relationship. The correlations range from 0.34 to 0.75 at the  $p < 0.05$  level, which suggests that the possible relationships of the variables in the conceptual model could be tested. Thus, there are no substantial multicollinearity problems encountered in this study.

**Table 4**  
Results of Path Coefficients and Hypotheses Testing

Hypotheses	Relationships	Coefficients	T-value	Results
H1a	PCA→MKA	0.22***	2.63	Supported
H1b	PCA→MKP	0.10	0.19	Not Supported
H2a	COA→MKA	0.44***	3.56	Supported
H2b	COA→MKP	0.05	0.17	Not supported
H3a	CFA→MKA	0.18***	1.71	Supported
H3b	CFA→MKP	0.20***	2.54	Supported
H4a	MCA→MKA	0.68***	6.57	Supported
H4b	MCA→MKP	0.07	0.18	Not Supported
H5	MKA→MKP	0.89***	7.55	Supported
H6a	PCA→MKA→MKP	0.56***	5.09	Supported
H6b	COA→MKA→MKP	0.67***	5.56	Supported
H6c	CFA→MKA→MKP	0.54***	5.05	Supported
H6d	MCA→MKA→MKP	0.79***	7.06	Supported

Notes: \*\*\* $p < 0.01$ ; CFI = 0.91; GFI = 0.93; IFI = 0.95; RMSEA = 0.05

In Table 4, the results of path coefficients and hypotheses testing of the direct and mediating hypotheses are presented. Firstly, product-centered accounting has a significant positive influence on marketing advantage ( $b = 0.22$ ,  $p < 0.01$ ). In existing literature, product-centered accounting is an effective control tool of new product development through a critical sub-process of innovation encapsulating all of the activities associated with developing a new product (Feeney and Pierce, 2018). It includes all information of the steps and activities necessary to complete a new product project marked by clear decision-making requirements. It helps provide an appropriate balance of firmness and flexibility required to govern the new product development process in order to respond to customer needs, beat competitor competencies and compete target markets. Accordingly, firms with great product-centered accounting implementation can enhance more sustainable marketing advantage. *Therefore, Hypothesis 1a is supported.* Surprisingly, product-centered accounting does not influence marketing performance ( $b = 0.10$ ,  $p < 0.17$ ). Firms can provide and achieve accounting information through implementing product-centered accounting that links to an adoption of a new idea or behavior in implementing new product development projects in an organization (Fagerlin and Löfstål, 2020). They can achieve outstanding marketing performance. In this study, product-centered accounting does not directly lead to marketing performance, but it may have a mediator that helps connect to marketing performance. This mediator is a go-between product-centered accounting and marketing performance. Thus, product-centered accounting has no influence on marketing performance. *Therefore, Hypothesis 1b is not supported.*

Secondly, customer-oriented accounting positively influences marketing advantage ( $b = 0.44$ ,  $p < 0.01$ ). It is an accounting practice directed towards appraising

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profit, sales, or the present value of earnings relating to a customer or group of customers (Ng and Wood, 2018). It includes a collection of techniques that identify, measure, communicate, and report information related to individual customers or customer groups. It is a strategically-oriented management technique linked with competitive advantage (Oyewo et al., 2020). Firms with customer-oriented accounting can increase market share, customer loyalty, customer retention, and customer satisfaction. They can improve sustainable competitiveness and competitive advantage in the long run. Accordingly, customer-oriented accounting helps promote more marketing advantages. *Therefore, Hypothesis 2a is supported.* In contrast, customer-oriented accounting is not an influencer of marketing performance ( $b = 0.05, p < 0.33$ ). It is a process of identifying, measuring, communicating, and reporting economic information relating to a customer or customer group (McManus, 2013). It facilitates resource allocation decisions regarding which customers to target and how to differentiate activities, such as direct marketing investments, credit terms, sales force activities, customer service activities, and delivery terms across customer relationships. It delivers superior financial returns that are sustainable over the long term. Firms with customer-oriented accounting can achieve profitability, shareholder value creation, market share, and customer patronage. However, customer-oriented accounting does not influence marketing performance in this study because it could not link to marketing performance. Moreover, it may need a critical connector between customer-oriented accounting and marketing performance as being similar to product-centered accounting. *Therefore, Hypothesis 2b is not supported.*

Thirdly, competitor-focused accounting has a positive influence on both marketing advantage ( $b = 0.18, p < 0.01$ ) and marketing performance ( $b = 0.20, p < 0.01$ ). It is the analysis of information from accounting issues related to competitors, to gain detailed insight into their present cost and financial position, to determine one's own competitive position, and to predict the future strategic behavior of the competitors (Usman and Bello, 2019). It provides detailed insight into a competitor's present cost and financial situation, determines one's own competitive position, and predicts future competitive strategic behaviors (Chiekezie et al., 2014). It creates relevant and accurate information base for making the right strategic decision and pursuing firms' competitive advantage and performance. Firms with great competitor-focused accounting implementation would pay more attention to each competitor's resources, objectives and competitive stance according to their competitive position, cost structure and performance result. Accordingly, they can promote more marketing advantage and achieve sustainable marketing performance. Thus, competitor-focused accounting positively influences both marketing advantage and marketing performance. *Therefore, Hypotheses 3a-3b are supported.*

Lastly, market-concentrated accounting has a significant positive influence on marketing advantage ( $b = 0.68, p < 0.01$ ), but it does not influence marketing performance ( $b = 0.07, p < 0.29$ ). In existing literature, market-concentrated accounting is a system that generates management accounting information for internal users, which is used for analyzing, learning, and utilizing market environments and conditions and adapting the businesses according to observed changes (Nguyen, 2018). It is a mechanism for developing an understanding of market and competitive environments and an establishing of a repository of strategy-attribute information, which is enveloped in the process of generated decision-making information for achieving competitive advantage. Firms with successful market-concentrated accounting implementation can

provide and analyze management accounting data about a business environment and a market condition, for use in developing and monitoring business strategy. They can achieve and gain a sustainable marketing advantage in the marketplace. Accordingly, market-concentrated accounting positively influences marketing advantage. *Therefore, Hypothesis 4a is supported.* While market-concentrated accounting is an important influencer of marketing advantage, it does not influence marketing performance. Similar to both product-centered accounting and customer-oriented accounting, market-concentrated accounting may influence marketing performance through a mediator of the relationships. Thus, the market-concentrated accounting-marketing performance relationships are not verified. *Therefore, Hypothesis 4b is not supported.*

In addition, marketing advantage plays a significant role in influencing marketing performance ( $b = 0.89, p < 0.01$ ). It helps discover the desires of customers and develops a range of products or services that satisfy their desires and achieve profits for a firm within a reasonable period (Shahbaz et al., 2022). It encloses a superior marketplace position in which the provision of customer value and the achievement of lower relative costs are superior to the competition. It helps firms to successfully deal with the requirements and demands of customers, regulations, and opportunities (Jain et al., 2020). Firms with a marketing advantage can have an edge over competitors in the marketplace by having a superior product, as well as promoting it and distributing it more effectively. They can increase the effectiveness of firms' marketing activities and better promote and enhance their long-term marketing performance and success. Accordingly, marketing advantage has a significant positive influence on marketing performance. A better marketing advantage is positively related to more marketing performance. *Therefore, Hypothesis 5 is supported.* Moreover, marketing advantage is a go-between for all dimensions of competitive accounting and marketing performance. All these dimensions can influence marketing performance through the mediator of marketing advantage. In the mediation relationship, this study can draw an arrow from all dimensions of competitive accounting to marketing advantage and then from marketing advantage to marketing performance. Thus, marketing advantage is a mediator of the research relationships. *Therefore, Hypotheses 6a-6d are supported.*

Table 5 presents the moderating influences of technology capability on the aforementioned relationships. Technology capability positively moderates the competitor-focused accounting-marketing advantage relationships ( $b = 0.18, p < 0.05$ ), the market-concentrated accounting-marketing advantage relationships ( $b = 0.25, p < 0.04$ ) and the competitor-focused accounting-marketing performance relationships ( $b = 0.19, p < 0.10$ ), but it does not moderate the product-centered accounting-marketing advantage relationships ( $b = 0.09, p < 0.33$ ), the customer-oriented accounting-marketing advantage relationships ( $b = 0.01, p < 0.98$ ), the product-centered accounting-marketing performance relationships ( $b = 0.14, p < 0.12$ ), the customer-oriented accounting-marketing performance relationships ( $b = 0.08, p < 0.56$ ), the market-concentrated accounting-marketing performance relationships ( $b = 0.12, p < 0.31$ ), and the marketing advantage-marketing performance relationships ( $b = 0.09, p < 0.33$ ). In existing literature, technology capability refers to the ability of firms to design and develop new processes and products. It helps upgrade knowledge and skills about the physical environment in a unique way. It also transforms the knowledge into instructions and designs for efficient creation of desired performance (Salisu and Bakar, 2020). It is a combination of skills, knowledge, experiences, machines, equipment, systems, and

procedures that generate special advantage for a firm to perform technical functions, develop new products and processes, and effectively operate firm facilities (Al-Mamary et al., 2020). It enables firms to identify, acquire, and apply new external knowledge to develop operational abilities, competencies, and capabilities, which leads to the attainment of superior performance. Accordingly, technology capability can strengthen the research relationships. *Therefore, Hypotheses 7c, 7d, and 8c are supported.* In contrast, the remainder of the research relationships are not moderated by technology capability. Utilization of technology capability does not help increase the strengths of these research relationships. *Therefore, Hypotheses 7a, 7b, 8a, 8b, 8d, and 9 are not supported.*

**Table 5**  
Results of Multiple Regression Analysis and Hypotheses Testing

Independent Variables	Dependent Variables		
	MKA	MKP	MKP
PCA	0.24** (0.14)	0.34** (0.15)	
COA	0.25** (0.15)	0.14 (0.16)	
CFA	0.09 (0.15)	0.21* (0.15)	
MCA	0.75*** (0.11)	0.51*** (0.11)	
MKA			0.65*** (0.09)
TNC	0.74*** (0.49)	0.47*** (0.38)	0.23** (0.09)
PCA*TNC	0.09 (0.09)	0.14 (0.09)	
COA*TNC	0.01 (0.14)	0.08 (0.14)	
CFA*TNC	0.18** (0.20)	0.19* (0.21)	
MCA*TNC	0.25** (0.11)	0.12 (0.12)	
MKA*TNC			0.09 (0.09)
OPP	0.12 (0.14)	-0.01 (0.15)	-0.12 (0.12)
EMM	-0.04 (0.09)	-0.13 (0.10)	-0.13 (0.08)
CAI	-0.03 (0.09)	0.12 (0.09)	0.14 (0.08)
Adjusted R <sup>2</sup>	0.61	0.58	0.62

Notes: \* $p < .10$ , \*\* $p < .05$ , \*\*\* $p < .01$ , <sup>a</sup>Beta coefficient with standard errors in parentheses.

## V. IMPLICATIONS AND DIRECTIONS FOR FUTURE RESEARCH

### **A. Theoretical Implication and Directions for Future Research**

According to the verification of profit maximization theory, competitive accounting is a process of business firms that undergo to ensure the best output, which price levels that are also achieved to maximize its returns. It is a key source of competitive advantage and performance. To expand the current research relationships, future research may need to review existing literature on the influences of competitive accounting on marketing performance because some dimensions of competitive accounting do not influence marketing performance. In addition, technology capability is proposed as the moderator of the research relationships, but a few relationships are confirmed. Future research may need to reexamine the moderating influences of technology capability. It may need to search for new, valuable moderators that are included in the conceptual model. Next, future research may consider using a comparative study to collect data from different groups or larger groups in order to prove the generalizability of the study. It may need to collect data from different industries, such as merchandising, manufacturing, and service industries, multinational and small- and medium-sized enterprises, and others. Moreover, market-concentrated accounting as one dimension of competitive accounting may be integrated to examine its concepts, consequences, and antecedents because this seems to be a paucity in previous studies. With these recommendations, future research would have more opportunities to expand the understanding of the market-concentrated accounting concepts.

### **B. Managerial Implication**

Competitive accounting is a new concept of integrated accounting and marketing disciplines. It is a key strategic tool and a valuable technique that helps enhance firms' outstanding marketing position, sustainable competitiveness and competitive advantage, long-term profitability, performance and success, and excellent growth, survival and sustainability. Accordingly, firms need to learn and understand the concept of competitive accounting, including factors and outcomes of its implementation. They need to invest capital, human resources, time, and other resources and assets in order to improve a competitive accounting system, as it can be used as a valuable strategic tool to respond to customer needs, wants, expectations, and requirements. In addition, it helps firms compete with their major competitors' abilities, capabilities, and competencies. Firms can cope with the rigorous and uncertain competitive markets and environments. Moreover, firms need to support good teamwork, collaboration, and participation from executives and employees. Greater teamwork, collaboration, and participation become a basic requirement for the successful implementation of competitive accounting in an organization. In summary, firms need to determine competitive accounting as a valuable business strategy and technique that helps enhance their sustainable competitiveness, long-term outstanding performance, and success in the volatile business markets and environments.

## **VI. CONCLUSION**

Competitive accounting is an internal process that can help firms succeed, survive and sustain in turbulent markets and environments, and it is a kind of strategic management



accounting system that can support firms to access necessary accounting information to achieve their objectives and consequently improve their performance. It can increase the quality of information and improve their decision-making and productivity. This study aims to investigate the influences of competitive accounting on marketing performance of food product businesses in Thailand through the mediating influences of marketing advantage and the moderating influences of technology capability. Competitive accounting includes product-centered accounting, customer-oriented accounting, competitor-focused accounting, and market-concentrated accounting. The samples of the study are 456 food product businesses in Thailand. The structural equation model is utilized to examine the direct and mediating influences, and multiple regression analysis is also applied to test the moderating influences. The results of the study suggest that competitive accounting (product-centered accounting, customer-oriented accounting, competitor-focused accounting, and market-concentrated accounting) has a significant positive influence on marketing advantage, and only competitor-focused accounting positively influences marketing performance. Next, marketing advantage is a key influencer of marketing performance, and it is also a mediator of the research relationships. Next, technology capability is a moderator of these relationships, including the competitor-focused accounting-marketing advantage relationships, the market-concentrated accounting-marketing advantage relationships, and the competitor-focused accounting-marketing performance relationships. In summary, competitive accounting is an important and valuable strategy that helps firms obtain sustainable business competitiveness and competitive advantage and achieve superior, outstanding organizational performance and success in the future and long-term aspects. In addition, future researchers need to review existing literature on the influences of competitive accounting on marketing performance and to reinvestigate the moderating influences of technology capability. They may also search for new valuable moderators, collect data from different groups or larger groups, examine market-concentrated accounting concepts, consequences, and antecedents, and expand the understanding of its concepts

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## Appendix

**Exhibit 1.** Measurement of all variables

Items
<i>Product-centered accounting (PCA)</i>
PCA1: We emphasize the provision and analysis of accounting information about developing and introducing new products and services
PCA2: We utilize the benefits and advantages of budgeting and variance analysis, cost accounting, and performance measurement in all stages of product innovation activities.
PCA3: We provide financial information relevant to cost management, target costing and budgets for the new products and services.
PCA4: We measure our costs and benefits linked to the new products and services.
PCA5: We provide costing practices from new product and service design to distribution through efficiency and economy of activity linkages from suppliers to customers.
<i>Customer-oriented accounting (COA)</i>
COA1: We calculate profit earned from a specific customer based on costs and sales that can be traced to a particular customer
COA2: We provide the objective profit measurement of a group or segment of customers
COA3: We extend the time horizon for customer profitability analysis to include future years
COA4: We calculate and measure the value of customers to a firm
COA5: We facilitate resource allocation decisions regarding which customers to target and how to differentiate activities
<i>Competitor-focused accounting (CFA)</i>
CFA1: We analyze competitors' positions within the industry by assessing and monitoring trends in their sales, market shares, volume, unit costs, and return on sales.
CFA2: We provide regularly updated estimates of competitors' cost structures.
CFA3: We analyze a number of a competitors' published statements as part of an assessment of a competitor's key sources of competitive advantage.
CFA4: We provide management planning and control, with detailed attention paid to each competitor's resources, objectives, and competitive stance.
CFA5: We analyze information from accounting issues related to competitors to predict the future strategic behavior of the competitors.
CFA6: We create a relevant and accurate information base for making the right strategic competitor decision and achieving performance.
<i>Market-concentrated accounting (MCA)</i>
MCA1: We generate management accounting information for internal users, which is used for analyzing, learning, and utilizing market environments and conditions and adapting the businesses according to observed changes.
MCA2: We provide management accounting data about government regulations for use in developing and monitoring business strategy.
MCA3: We develop an understanding of changing conditions industry-wide and an establishment of a repository of strategy-attribute information, which is enveloped in the process of generating decision-making information for achieving competitive advantage and performance.
MCA4: We provide technology change and growth information gathering, and fast reactions to demands to gain valuable marketing competitiveness and receive superior marketing results.
MCA5: We have abilities, competencies, and capabilities to create useful information in order to deal with and compete with market environments and enhance great business results.
<i>Marketing advantage (MKA)</i>
MKA1: We can seek to discover the desires of customers and develop a range of products or services that satisfy their desires and achieve profits for a firm within a reasonable period.

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MKA2: We can enclose a superior marketplace position in which the provision of customer value and the achievement of lower relative costs are superior to the competition.

MKA3: We can have a better ability to respond to customer wants and needs, compete with competitor competencies and capabilities, and overcome market conditions and competitive environments.

MKA4: We can have an edge over competitors in the marketplace by having a superior product, as well as promoting it and distributing it more effectively.

MKA5: By creating products that offer superior gratification, we can gain a competitive edge that may be a result of correctly recognizing customer needs and wants.

MKA6: We can present a powerful strategy for competitive markets through providing customers with high-quality products and services and launching new features of products to customers and markets.

*Marketing advantage (MKA)*

MKA7: We can achieve a long-term benefit resulting from unique and value creation processes asynchronously with potential competitors and dynamic rivals that cannot be easily copied or imitated

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*Technology capability (TNC)*

TNC1: We acquire a substantial technological background and use it in the development of new products.

TNC2: We apply the latest technology for introducing new products, besides improving existing products and services through encouraging and supporting innovative ideas.

TNC3: We introduce and utilize new technologies, products, and innovations in our business operations.

TNC4: We acquire and update the new and advanced technologies and use sophisticated technologies in the development of our new products and services.

TNC5: We can achieve long-term success and customer value that is best created through new technological solutions, processes, products, and services under technology-oriented operations.

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