

Strategic Management Accounting on Competitive Advantage

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ABSTRACT

This study investigates the effect of business strategy on strategic management accounting (SMA) and its indirect effect on the competitive advantage of the rice export business in Thailand. A total of 215 major rice export businesses in Thailand in 2022 are chosen as the sample population, and data are collected. The results of the structural equation model (SEM) of the analysis model are found using an index that examines the absolute quality-of-fit measure. Additionally, the results of ordinary least squares (OLS) regression analysis, path coefficients, and hypothesis testing show that business strategy positively affects SMA. In addition, SMA plays a positive and significant role in competitive advantage. As for the theoretical contribution, conceptual SMA is explained by a resource-based view that focuses on resources influence on sustainable performance through competitive advantage. It is hoped that the present study will contribute significantly to the managerial contribution of rice export businesses, as SMA could support organizations in creating a competitive advantage.

KEYWORDS

Big Data Analytics, Business Strategy, Competitive Advantage, Strategic Management Accounting

1. INTRODUCTION

Thailand has been a renowned agricultural country for a long time. More than half of the country's population is employed in agriculture. Consequently, Thailand's agricultural industry is critical to the economy and society, as it is a major source of national revenue. Rice is not only a staple diet for Thai people but also an important export crop for Thailand, which is now the world's fastest-growing rice producer and the epicenter of rice research (Thai Rice Exporters Association, 2022). Thailand exported abundant rice in one year, earning hundreds of billions of baht in revenue. Thai rice exports include paddy, jasmine, non-glutinous rice, and sticky rice. During 2019–2021, Thai rice production expanded slightly because of attractive prices, causing farmers to expand their planted area and add more planting cycles, even under drought conditions that could reduce production in 2019. Export volumes were likely to decline at the end of this period. The trading partners demand that the discharge of old rice in the government's stockpile should be accelerated while the export price is still reasonable because of the high quality of exported Thai rice. However, global rice stocks

DOI: 10.4018/IJABIM.321193

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continue to increase because of export price support. Overall, the rice export value is expected to increase (Sowcharoensuk, 2019). However, from January to June 2020, compared to the previous year (January–June 2019), rice exports totaled 2,885,536 tons, a decrease of -33.78% from 2019, or US\$1,963.05 million, a decrease of -14.10% from 2019. Thailand's main competitors in rice exports are Vietnam, the United States, and Australia (Ministry of Commerce, 2021).

Thailand's agricultural sector is highly competitive, and the manufacturing sector mainly drives its economy for exports. Therefore, exports play an important role in generating income. However, the political, economic, and business management mechanisms related to the rice trade in Thailand are complicated. Thai rice exports also face natural disasters such as frequent droughts and increasing global rice production, with competing countries developing better rice varieties. This causes Thailand to lose more share in the world rice market, while its main competitors, Vietnam and India, can still maintain or increase their export market share. In 2020, Thailand's rice exports dropped by 25% compared to the previous year, whereas Vietnam's rice exports decreased by only 2%. Despite banning rice exports from maintaining the domestic rice supply during the COVID-19 pandemic, India increased its exports by more than 40% owing to higher yields. This reduced the competitiveness of Thai rice in the world market; Thai rice exports fell from No. 1 to No. 3. Wangvanichpan et al. (2016) discussed the major problem of Thai rice losing market share due to low productivity and high costs, making it unable to compete on price. In addition, exporters focus on short-term price competition. However, competitors have improved rice quality and production, causing Thailand's advantages to decline.

Putthasiri's (2015) determinants of paddy rice prices in Thailand examine the factors affecting the price of rice. The study found that variables such as the consumer price index, rice export volume, and rice yield correlated in the same direction as with prices of jasmine rice in Thailand, and independent variables such as gross domestic product (GDP), the exchange rate of dong per US dollar, the exchange rate of baht against the US dollar, interest rates, money market rates, and the amount of money in the economy correlated with the price of paddy rice in the opposite direction. In addition, Jinfeng and Chamboon (2017) studied the factors affecting the quantity of Thai rice exported to China during 2007–2017. It was found that the factors affecting the quantity of Thai rice exports to China were population, rice export prices of Thailand and competitor countries (Vietnam), and the marketing strategies of Thai entrepreneurs exporting Thai Hom Mali Rice to Hong Kong. Paosoong and Polsarum's (2018) results showed that price strategy was crucial in driving Hong Kong's importers' decision to import Thai Hom Mali Rice. The pricing strategy is flexible and can be determined in various ways, including pricing revenue, sales volume, and image. However, for Thai rice exports to compete in the long term and stand up as a market leader, the "rice export" business must create a long-term competitive advantage through accounting strategies in addition to the factors mentioned above and marketing strategies.

Strategic management accounting uses management accounting information to analyze business and competition to develop and monitor business strategies. Strategic Management Accounting assists in the management of accounting, which defines the strategic direction of an organization to be used as input for decision-making and control and is critical to business operations. As businesses face an increasingly competitive environment, it is imperative to obtain useful, appropriate, and timely internal and external information for management decision-making (Guinding et al., 2012). The management process of strategic theories executives is important in being used as a tool to create competitive advantages. The study of strategic management accounting is critical because, in today's world, a decisive approach is increasingly being added to the classic view of management accounting as a technical method for calculating expenses (Duçi, 2021). Strategic management accounting approaches are both outward- and forward-looking. They usually span numerous periods and are involved in all stages of strategic decision-making (Cencon, 2019). This study focuses on strategic management accounting (SMA) in creating both financial and non-financial information for executives of Thai rice-exporting companies to use in planning, controlling, decision-making, policy-making, assessment,

analysis, and investment management, including asset control and business administration, including cost and expense control. This gives rice exports a sustainable competitive advantage. Accounting information is one of the factors that enables a business to operate efficiently. Quality management accounting information can provide useful information for planning, utilizing past information to plan the future. It is also a medium for linking information and analysis to select the best course of action (Ditkaew, 2015).

For the abovementioned reasons, this study attempts to fill and expand the previous research gap in managerial accounting. Then, a study of SMA to generate competitive advantages for rice exporters will be used by executives, entrepreneurs, and agencies. The findings provide guidelines for using and focusing on management accounting data to develop strategies based on innovative business accounting, leading to long-term competitive advantages. This study makes the following contributions: In terms of expected theoretical contributions, the resource-based view (RBV) of the firm can be tested to determine whether it can be used to explain (1) the factors that influence rice exporters' SMA and (2) the impact of SMA on economic advantages and long-term competition. In addition, this study can expand the knowledge of the SMA in Thailand as a developing country as well as in developed countries. Regarding practical contributions, Thai rice exports can use SMA to develop and improve their performance and competitive advantage at national and international levels.

2. LITERATURE REVIEW

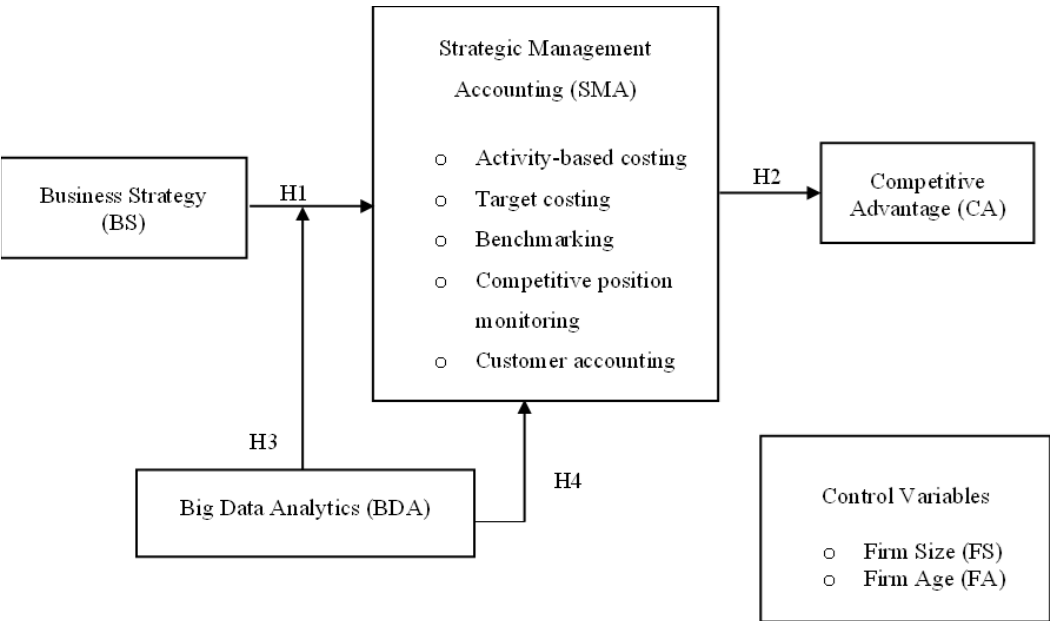
2.1 Resource-Based View of the Firm

In the RBV of the firm, the focus is on internal resources. Barney (1991) argued that the RBV describes the characteristics of organizational capacity and resources that are important drivers. To create a competitive advantage, the RBV must have an important factor in the capacity and resources of the organization, such as uniqueness, unity, assets that are hard to find, self-worth, and difficult-to-imitate or substitute. In particular, resources united within an organization can create a sustainable competitive advantage in the long term (Barney, 1991). The RBV theory has changed attitudes toward competitive strategies. By modifying the original perspective considering the results, let us analyze the source of competitive advantage: resources (Forsman, 2004) and the organization's internal factors. Internal factors can explain the differences in each organization's performance. Past research has shown the importance of resources available to organizations, both visually and personally, as critical for building a good organizational structure (Kamyabi and Devi, 2011). Subsequently, the organization's human resources are classified into two types—tangible and intangible (Hafeez and Essmail, 2007). However, several past accounting studies still use RBV theory as a guideline, linking research frameworks using causality. In accounting research, organizational resources include knowledge, work skills, and concentration of accounting data (Jayabalan et al., 2009) through accounting (Rahman and Ramli, 2014). In addition, organizational learning and management knowledge involve management processes that create a sustainable and strong competitive advantage (Zollo and Winter, 2002). In this study, the firm (RBV) describes the conceptual research framework. This section describes the role of strategic management in accounting, including the resources and capabilities of the rice exporter's organization. These include an organization with useful information to create management innovations as an important tool in business competition, increasing the ability to serve customers and build relationships both inside and outside the organization, and using data for work planning as the basis for business growth, thus enhancing the speed of operations and decision-making. The result is a sustainable competitive advantage, as shown in the conceptual framework in Figure 1.

2.2 Strategic Management Accounting

The SMA uses management accounting information to analyze business and competition in developing and monitoring business strategies (Simmonds, 1981). Management Accounting is the accounting

Figure 1.
 Conceptual model



process. It starts by taking notes, classifying and categorizing both monetary and non-monetary items, and summarizing the results as past financial information or financial information derived from projections or forecasts. The nature of information depends on the management's needs. Flexibility according to user needs, including presentation forms that are easy to understand in the form of graphs or charts. The goal is to help executives and employees plan, direct, control, and make accurate and timely decisions to achieve the organization's highest objectives (Ditkaew, 2019). Based on their literature review of SMA, Bromwich (1990) and Roslender and Hart (2003) concluded that SMA is a management and analysis of a company's financial data in the product market competitor's cost competitor's ability cost structure; therefore, it is concerned with using accounting information within the organization as a management tool for decision-making, planning, and control. Therefore, the SMA provides in-depth information. This is more than what appears in confidential financial statements related to departments at different levels of the organization; only management and department heads receive such information designed to encourage executive engagement, which is not disclosed to outsiders or the public. This involves management and decision-making to adjust strategies and solve issues in a timely manner.

Moreover, this study synthesizes past research on SMA related to SMA practices and organizational performance. Noordin et al. (2015) investigates the performance outcomes of SMA information usage in Malaysia. The results indicate that the extent of SMA information usage is significantly related to certain aspects of company performance. The current research has revealed some notable developments in the SMA. Our results imply that the SMA has made extensive progress in Malaysia, something not reported empirically by fellow researchers. Nonetheless, more work must be conducted to establish the important elements of SMA. Additionally, Amanollah et al. (2017) investigated the effect of chief executive officer (CEO) characteristics and involvement in networks on SMA and, in turn, the indirect effect of SMA on company performance. The results indicate significant and positive relationships between CEO education and the application of SMA, as well as between involvement in networks and SMA. Moreover, SMA indirectly affects the relationship

between CEO education, involvement in networks, and company performance. Notwithstanding the various perspectives on SMA, this study contributes to the literature from a structural perspective. It also attempts to enrich the current knowledge of information elements portraying SMA. Specifically, this study develops an SMA conceptualization of strategic information requirements in the quest for an organization's sustainable competitiveness.

However, an outstanding feature of this research is that it supports changing technology and the big data era for business. Thus, using big data analytics (BDA) as a moderator variable that affects SMA, it states that management accounting is an accounting process that begins with recording, classifying, and categorizing both monetary and non-monetary items and summarizes the results to produce past or estimated future financial data. The nature of the information depends on management needs, which require flexibility, including using a form of presentation that is easy to understand, in the form of graphs or charts. The goal is to provide useful information for executives and employees to use in planning, directing, controlling, and decision-making that is accurate, timely, and able to achieve the organization's highest objectives. Data analytics, even as basic as helping coordinate different departments, cost data, or volume and profit information, will help strategic planning for executive decision-making and investment decisions regarding new product releases in project performance appraisals. Additionally, predictive analytics can be applied to budgeting for optimal planning and control.

2.3 Business Strategy – SMA

Miles and Snow (1978) discussed a framework of four types of strategies: defender strategy, analysis strategy, proactive strategy, and response strategy, most of which are implemented. They used only two strategies: an aggressive strategy and a defense strategy. A proactive strategy is to seek new opportunities, such as fortune tellers, in an unpredictable, dynamic environment. New opportunities for exploration always exist, and defender strategies tend to be more protective. The defender strategy prevents anyone from attacking or moving away (Keyser, Kruif & Frese, 2000) from a stable, predictable, efficient, rigorous, and highly formal environment. There is a division of labor that is a combination of powers. However, proactive strategies involve a constant search for new products and innovation opportunities. Continuously opinionated creators search for product and market opportunities. In contrast to the defender strategy, to be a marketing innovator, the focus is not on what leads to success but on efficiency, starting from the environment and important future goals. Accordingly, one can determine whether the strategy is proactive or defensive. Both proactive strategies were consistent with the use of the SMA. SMA techniques can be widely used as part of aggressive strategies. In line with Guilding (1999), there is a positive correlation with the application of an aggressive strategy focus, leading to the following hypothesis:

H1: Business strategy positively affects SMA.

2.4 SMA – Competitive Advantage

According to Porter (1985), there are three types of competitive advantage: (1) Creating a cost competitive advantage involves cost management at a lower cost than competitors. This includes the business's ability to design, manufacture, market, and deliver superior products at prices close to or lower than those of other vendors using fewer inputs and increasing operational efficiency. Focusing on offering goods and services at a lower cost results in higher returns and profits, allowing survival in a highly competitive situation. In differentiation competition, costs are managed to differentiate products and provide value superior to competitors, achieving the highest customer satisfaction, both in the form of quality differences and in the shape of the products and services that customers receive. Creating a corporate identity is an organization's attempt to provide a service different from that of other organizations. This is unique because the service recipient frequently recommends it.

Most of these factors relate to service quality and special conveniences that satisfy customers. (3) Building competitive advantage involves focusing on responding to specific market segments. Cost management focuses on market penetration for specific groups of customers, service recipients, or groups with special needs (niche markets). Therefore, the benefits of using SMA include gaining and sustaining a competitive advantage (International Federation of Accountants, IFAC, 1998; Roslender & Hart, 2003; Oboh & Ajibolade, 2017). The SMA's long-term orientation and future outlook suggest that its application should enable organizations to sustain competitive advantages by consistently improving and maintaining above-industry-average performance not only in the short run but also in the medium- to long-term. The dimensions of competitive advantage that may accrue because of SMA are financial and nonfinancial, such as customer satisfaction, enhanced product development, product quality, and financial returns. Several studies have reported a positive association between SMA and organizational performance (Eker & Aytaç, 2016; Oboh & Ajibolade, 2017). This study proposes the following hypothesis:

H2: SMA positively affects competitive advantage.

2.5 Moderator Effect of Big Data Analytics on SMA

The role of management accountants has also changed in modern business environments. These changes in the management accounting function emanate from the earlier researchers' criticism of early management accounting systems or traditional management accounting (TMA) systems (e.g., Johnson and Kaplan, 1987; Baines and Langfield-Smith, 2003). For instance, Johnson and Kaplan (1987) note that TMA systems do not provide sufficient relevant information for management in a new manufacturing environment that adopts advanced technologies. Developing new management accounting techniques is appropriate to change the business environment. Therefore, SMA is the accounting profession's response to management accounting techniques. Simmonds (1981), who first coined the term strategic management accounting, viewed it as a collection of externally oriented management accounting techniques that analyze data on a business and its competitors, which can also be used to develop and monitor business strategy. Guilding et al. (2000) regarded SMA as a future-oriented, externally inclined accounting technique that covers a timeframe beyond one year (long term). The CIMA (2005) conceives SMA as a form of management accounting that emphasizes information relating to external factors, as well as non-financial, internally generated data, ensuring goal congruence. Recent SMA literature has agreed that implementing the SMA technique in a company is necessary to monitor external performance as well as the internal efficiency and effectiveness of organizations (Smith 2000; Lamberti and Noci, 2006). The demand for effective and efficient solutions to problems stresses a customer-centric system, making the use of IT essential (Torres, Pina and Acerete, 2005); in particular, the information era and the emergence of big data require data analytics, whether it is a basic data analysis that helps coordinate departments, cost, volume, and profit data that inform strategic planning for executive decision making or new product investment decisions with a project performance appraisal. Additionally, predictive analytics can be applied to budgeting for optimal planning and control. Empirical studies examining the relationship between IT and performance demonstrate a positive relationship between IT competency and organizational performance (e.g., Bharadwaj, 2000; Broadbent, Weill, and Neo, 1999; Ravinchandran and Lertwongsatien, 2005; Ray, Muhanna and Barney, 2005; Wade and Hulland, 2004). However, empirical evidence on the effect of BDA on an organization's SMA usage is lacking. Hence, this study proposes the following hypothesis:

H3: BDA positively influences business strategy and the SMA relationship.

H4: BDA positively affects SMA.

3. RESEARCH METHOD

3.1 Population and Sample

This study conducted quantitative research using a survey to determine the sample size by estimation from observations. The population used in this study is Thailand's rice export business. A total of 274 major rice export businesses in Thailand in 2022 were chosen as the population, and data were collected (Ministry of Commerce, 2022). Regarding the questionnaire mailing, 215 responses were received. The effective response rate was approximately 78.10%. According to Aaker et al. (2001), a response rate for a mail survey greater than 20%, with an appropriate follow-up procedure, was considered acceptable.

Data collection for this study was approved by the Human Research Ethics Committee at the Rajamangala University of Technology Lanna (RMUTL-IRB: RMUTL-IRB 063/2022) based on the criteria of the Declaration of Helsinki and the International Conference on Harmonization in Good Clinical Practice (ICH-GCP).

3.2 Variables and Measures

Construct measurements were developed based on current literature. Each construct is measured using multiple items. Although all constructs are clearly stated, owing to their abstract nature, it is difficult to directly express or witness the scale (Lohapan, 2021). Undoubtedly, the variables are estimated scales based on their definitions and applied based on relevant accounting research and other related publications. They were measured using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree).

A questionnaire was developed to assess the quality of the tool in two areas: content validity and reliability:

1. **Content validity:** Check for language consistency, accuracy, appropriateness, clarity, comprehensiveness, completeness, and appropriateness by employing item-objective congruence (IOC). This individual conformity index requires that the IOC value must not be less than 0.5 to demonstrate that the measuring instrument meets the measured objectives (Polit & Beck, 2012). Three experts selected questions with an IOC value greater than 0.5. The IOC was 1.00.
2. **Reliability:** The questionnaire was used for a 50-set pilot test with non-target sample groups to check for relevant and appropriate questions. The questionnaire's confidence was then tested using a questionnaire confidence test package that used Cronbach's alpha coefficient formula and the alpha criterion to calculate the questionnaire's confidence. Cronbach's alpha calculates an instrument's confidence level (Cronbach, 1990, p. 204). The result should be greater than 0.7, suggesting that the questionnaire used in this study was reliable and capable of measuring the variables. The Cronbach's alpha coefficient was used to determine whether the questionnaire's confidence level was between 0.742 and 0.902, which passed the required standards.
3. **Structural equation model (SEM):** The results of the fit index of the analysis model were indicated by an index examining the absolute quality of the fit measure (Hair et al., 2014) using

Table 1.
Result of measure validation

Variables	Factor Loadings	Item-Total Correlation	Cronbach's Alpha
Strategic Management Accounting (SMA)	0.80-0.89	0.60-0.74	0.915
Business Strategy (BS)	0.64-0.86	0.65-0.87	0.731
Competitive Advantage (CA)	0.80-0.90	0.68-0.72	0.800
Big Data Analytics (BDA)	0.68-0.86	0.63-0.74	0.734

specified criteria. Table 2 presents the results of the model fit analysis of the research framework. When considering the criteria of every key performance indicator, the empirical data and factor analysis model showed perfect goodness-of-fit.

A software was used to analyze the data collected from the questionnaire. To distribute the variables investigated, the data analysis was divided into fundamental data analysis of the respondents using descriptive statistics such as the mean and standard deviation. In conclusion, a study on the association between empirical factors such as SMA, business strategy, competitive advantage, and BDA was conducted using regression analysis to analyze the relationship between dependent and independent variables. Ordinary least-squares (OLS) regression analysis was used to test these hypotheses. Several equations were formulated to examine all the relationships related to the hypotheses in each submodel.

4. FINDING AND DISCUSSION

4.1 Correlation Matrix

Table 3 presents the descriptive statistics and correlation matrices for all the variables. Multicollinearity occurs when two or more predictors are linearly related.

In general, an absolute correlation coefficient of >0.8 among two or more predictors indicates the presence of multicollinearity (Hair et al., 2010). The correlations ranged between 0.351 and 0.729 at a $p\text{-value} = 0.01$ significance level, which means that possible relationships between the variables in the conceptual model could be tested. Therefore, no substantial multicollinearity was observed.

4.2 Regression Analysis

Table 4 presents the results of the ordinary least squares (OLS) regression analysis of hypotheses 1–4. The results show that business strategy has a positive and significant effect on SMA ($\beta=0.832$, $p<.01$). Thus, Hypothesis 1 is supported. Moreover, the results show that SMA has a significant positive influence on competitive advantage; thus, H2 hypothesis test results are supported ($\beta=0.305$, $p<.01$). Additionally, Table 4 presents the results of the ordinary least squares regression analysis showing that BDA as a moderator positively influences business strategy and SMA relationships and that BDA positively affects SMA ($\beta=0.344$, $p<.01$, $\beta=0.472$, $p<.01$). Therefore, Hypotheses H3 and H4 are supported.

4.3 Discussion of Key Findings

As a result, using SMA information positively affected the competitive advantage of rice export companies, which is consistent with Elnathan et al. (1996), who found that benchmarking

Table 2.
Results of analysis of model goodness-of-fit of the conceptual model

Quality of fit measure	Model's Fit Based on Criteria	Statistics	Results
Chi-square/df	Less than 3.00	2.276	Passed
p-value of Chi-square	More than 0.05	0.107	Passed
GFI	More than 0.90	0.963	Passed
NFI	More than 0.90	0.967	Passed
CFI	More than 0.90	0.981	Passed
RMR	Less than 0.05	0.012	Passed
RMSEA	Less than 0.05	0.047	Passed

Figure 2.
Result of the analysis of the model fit of research framework

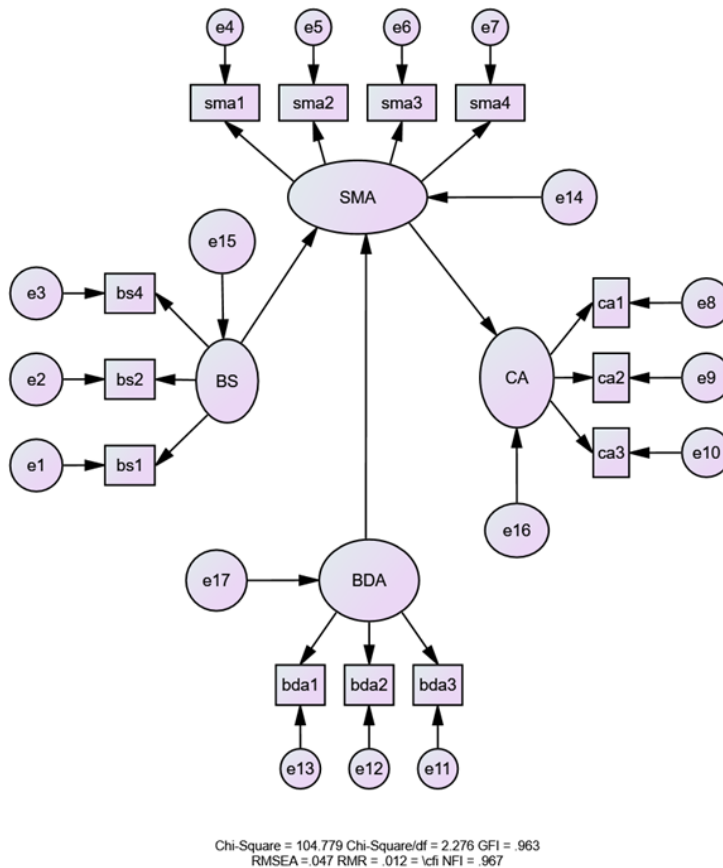


Table 3.
Descriptive statistics and correlation matrix

Variables	SMA	BS	BDA	CA
Mean	4.34	4.39	4.63	4.44
Standard Deviation	0.46	0.40	0.40	0.38
Strategic Accounting Management (SMA)				
Business Strategy (BS)	.729**			
Big Data Analytics (BDA)	.478**	.678**		
Competitive Advantage (CA)	.351**	.640**	.544**	

** Correlation is significant at the .01 level.

techniques in a competitive environment led to better performance. Using information through the SMA benchmarking technique, integrated performance measurement and value chain analysis, quality costing, and competitor performance comparison enables executives to learn from external organizations. This finding is consistent with those of Cadez and Guilding (2008), Collier and

Table 4.
Results of regression analysis for test hypotheses H1-H4

Independent Variables	Dependent Variables	
	SMA	CA
Business Strategy (BS)	.832*** (.054)	
Strategic Management Accounting (SMA)		.305*** (.056)
Business Strategy*Big Data Analytics (BS*BDA)	.344*** (.043)	
Big Data Analytics (BDA)	.472*** (.043)	
Firm Size (FS)	.184 (.067)	.387 (.055)
Firm Age (FA)	.191 (.056)	.228 (.054)
Adjusted R ²	.729	.834
SEE	.315	.374

Sig. of F = .000, ***p<.01

Gregory (1995), Dixon (1998), Lord (1996), and Rickwood et al. (1990). This result also aligns with the long-held view of management accounting textbooks, which argues for properly using accounting information to improve firm performance (Drury, 2000). In terms of business strategy, a factor that influences SMA, this implies that complete forward planning and opportunity-seeking strategies are highly positively correlated with success, which is consistent with Keyser et al. (2000), who studied small entrepreneurs in Zambia. Frese et al. (2000) studied small entrepreneurs in Zimbabwe and found that planning and implementing proactive strategies are essential for entrepreneurial success. In addition, a complete strategy and specific planning are important, including pursuing opportunities that are positively correlated with success. Marguerite (2005) also used a retail strategy model as a test. Miles and Snow's empirical model, which aims to analyze strategy dimensions to increase competitiveness within the retail industry, reveals that increases in strategic behavior and retail companies can categorize their implementation accordingly. From a proactive management perspective, retailers can monitor strategic behavior that is consistent with goals and inconsistent with planning for change, and companies can also predict competitor behavior. Moreover, Cencon et al. (2018) found a relationship between strategy type and the use of the SMA technique. Therefore, the key finding of the business strategy for SMA in this study is that the company has—a strategy that is suitable for the current situation, a strategy for planning production and controlling production appropriately, and a strategy to reduce the amount of inventory/inventory to reduce storage space and costs. Administrative expenditure results in strategic management, accounting for rice exporters and using accounting information for further use. In addition, the SMA results have a significant positive influence on competitive advantage, showing the importance of accounting data, activity-based costing, target costing, benchmarking, competitive position monitoring, and customer accounting in creating products and services differentiated from competitors and creating maximum customer satisfaction. All dimensions of SMA also indicate that a company's resource procurement is sufficient, appropriate, and timely, saving time and related costs and being able to set prices for products or services that are attractive to customers at different prices from others in the same market. This study is consistent with a study by Höglund et al. (2021) to generate further knowledge about strategic management

accounting (SMA) in the public sector context. The authors attempted to achieve this by studying SMA work in a public sector agency (PSA): the Swedish Transport Administration (STA). Rashid et al. (2020) review empirical studies focusing on the adoption, benefits, and contingencies of strategic management accounting (SMA) practices and the effects of adoption on firm performance. Rashid et al.'s (2020) findings focused on empirical studies that concentrated exclusively on SMA practices. The adoption status, derived benefits, contingent factors affecting adoption decisions, and the effect of adopting a package of SMA techniques on several aspects of firm performance are presented in the context of both developed and developing economies.

Additionally, this study explores BDA as a moderator influencing the relationship between business strategy and SMA. The results demonstrate that to leverage big data analytics and realize performance gains, and firms must develop strong big data analytics capabilities (Mikalef et al., 2019). A previous study by Holmlund et al. (2020) provided an overview of opportunities to use BDA for customer experience management, which is part of SMA and a sustainable source of competitive differentiation. From the foregoing, it indicates that data have become a valuable asset for businesses. Every organization must pay attention to this information. Previously, data collection and analysis had several limitations that affected planning, control, and management. However, data-management constraints have either reduced or disappeared after entering the digital technology era. The ever-growing amount of data and BDA have become essential tools for every aspect of a business. However, accounting uses data to assess performance, demonstrating an entity's financial position within the framework of accounting principles and methods. Management decisions must be based on accounting information. Therefore, driving businesses with big data requires an in-depth analysis to cope with the changes occurring in the data world and make the most of the analyzed data, providing useful information for executives and employees to use in planning, directing, controlling, and making decisions that are accurate, timely, and able to achieve the firm's highest objectives. In-depth analysis (data analytics), whether a basic data analysis that helps coordinate different departments, cost data volume, or profit data, will help in strategic planning for executive decision-making, new product investment decisions, and project performance appraisals. Additionally, predictive analytics can be applied to budgeting for optimal planning and control. Thus, our findings extend what has been reported in the literature.

5. CONTRIBUTION AND DIRECTIONS FOR FUTURE RESEARCH

5.1 Theoretical Implications

This research confirms that the RBV of a firm is a valuable theory that can clarify the effects of SMA; that is, resources and capabilities within the rice exporter's organization can provide useful information to create management innovations and important tools for business competition. Moreover, BDA acts as a moderator and positively influences business strategy and the SMA relationship, which leads to competitive advantage; it also directly affects SMA, leading to competitive advantage. In other words, information is an organizational asset with intrinsic value and is difficult to imitate or

Table 5.
A summary of the hypotheses testing

Hypotheses	Relationship	Results
H1	Business strategy positively affects SMA.	Supported
H2	SMA positively affects competitive advantage.	Supported
H3	Big data analytics positively influences the business strategy and SMA relationship.	Supported
H4	Big data analytics positively affects SMA.	Supported

replace to gain a competitive advantage. This study confirms previous research, showing that BDA is important in the new, normal, and disruptive technology era.

5.2 Managerial Implication of the Study

This study reflects the benefits of applying strategic management accounting for decision-making in Thai rice exports to enhance long-term competitiveness and stand up as a market leader. Exporting rice with an aggressive strategy as a driving force towards strategic management accounting until finally able to create competitive advantages: In the information age, big data analysis helps to analyze cost, volume, and profit data for strategic planning and decision-making for executives. New product release investment decisions in project performance appraisal. Additionally, predictive analytics can be applied to budgeting for optimal planning and control. SMA, business strategy and competitive advantage are inputs for the same conceptual model. All the research relationships were empirically confirmed.

5.3 Limitations and Future Research

The study's findings should be interpreted cautiously in light of these limitations. First, there were limitations concerning the scale of the survey conducted in this study. Owing to its nature as a pilot study, the population and sample size were limited to rice exporters in Thailand. Second, the variables—SMA, business strategy, BDA, and competitive advantage—in the questionnaire may not be inclusive. In particular, in the SMA summarized in the questionnaire, achieving operational excellence and maximizing shareholder returns can all serve as strategic exporters in other countries. If these broader strategy concepts are adopted, the potential list of SMA techniques could be much longer, including many other techniques, such as economic value added (EVA), beyond budgeting, etc. In addition, future research may need to add more antecedence that affects SMA and development variables to strategic management innovation to support export rice companies. To test the generalizability of future research, a comparative study should be conducted to test the direct and indirect effects of the research relationship and compare the results to those in this study, yielding more benefits and increasing the general applicability of the results.

6. CONCLUSION

Every firm's management process requires useful accounting information to support planning, control, operations, and decision-making. Executives must have accounting information to guide management in achieving organizational goals. Especially in the era of rapid technological change, the digital information era affects every organization's ability to adapt to keep up with the competition. Notably, this study investigates the factors that influence rice exporters' SMA and the impact of SMA on economic advantages and long-term competition. The highlights of this study are that BDA positively influences business strategy and SMA relationships and that BDA positively affects SMA during the digital information epidemic in Thailand. In total, 215 rice export companies were selected for the study sample. The results show that business strategies affect the SMA. Furthermore, SMA leads to a company's competitive advantage. The usefulness of BDA moderates the business strategy-SMA relationship. In addition, BDA directly influences the SMA. However, future research must create antecedents of the effect on SMA and use the competitive advantage concept to build dimensions. Moreover, firm executives can apply and utilize managerial accounting information as a valuable tool to build a competitive advantage for exporting rice companies.

REFERENCES

- Aaker, D. A., Kumar, V., & Day, G. S. (2001). *Marketing Research* (7th ed.). John Wiley and Sons.
- Baines, A., & Langfield-Smith, K. (2003). Antecedents to management accounting change: A structural equation approach. *Accounting, Organizations and Society*, 28(7-8), 675–698. doi:10.1016/S0361-3682(02)00102-2
- Barney, J. B. (1991). Firm resources and sustainable competitive advantage. *Journal of Management*, 17(1), 99–120. doi:10.1177/014920639101700108
- Bharadwaj, A. S. (2000). A Resource-based perspective on Information Technology capability and firm performance: An empirical investigation. *Management Information Systems Quarterly*, 24(1), 169–196. doi:10.2307/3250983
- Broadbent, M., Weill, P., & Neo, B. S. (1999). Strategic context and patterns of IT infrastructure capability. *The Journal of Strategic Information Systems*, 8(2), 157–187. doi:10.1016/S0963-8687(99)00022-0
- Bromwich, M. (1990). The case for strategic management accounting: The role of accounting information for strategy in competitive markets. *Accounting, Organizations and Society*, 15(1-2), 27–46. doi:10.1016/0361-3682(90)90011-1
- Cescon, F., Costantini, A., & Grassetti, L. (2018). Strategic choices and strategic management accounting in large manufacturing firms. *The Journal of Management and Governance*, 23(3), 605–636. doi:10.1007/s10997-018-9431-y
- Cronbach, L. J. (1990). *Essentials of psychological test*. Harper Collins.
- Ditkaew, K. (2015). Managerial accounting quality, management innovation, productivity, and competitive advantage of rice mill businesses in North Region, Thailand. *Journal of Modern Management Science*, 8(1), 47–66.
- Ditkaew, K. (2019). Managerial Accounting Information Competencies of Sugarcane Planting in Thailand. *Asian Administration and Management Review*, 2(1), 135–151.
- Eker, M., & Aytac, A. (2016). Effects Of Interaction Between Erp And Advanced Managerial Accounting Techniques On Firm Performance: Evidence From Turkey. *Muhasebe ve Finansman Dergisi*, October, 187–209.
- Guilding, C., Cravens, K. S., & Tayles, M. (2000). An international comparison of strategic management accounting practices. *Management Accounting Research*, 11(1), 113–135. doi:10.1006/mare.1999.0120
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Prentice Hall.
- Höglund, L., Caicedo, M. H., Mårtensson, M., & Svårdsten, F. (2021). Strategic management accounting in the public sector context: The case of the Swedish Transport Administration. *Journal of Public Budgeting, Accounting & Financial Management*, 33(4), 468–486. doi:10.1108/JPBAFM-12-2019-0180
- Johnson, H. T., & Kaplan, R. S. (1987). *Relevance Lost the Rise and Fall of Management Accounting*. Harvard Business School Press.
- Keyser, M., De Kruif, M., & Frese, M. (2000). The psychological strategy process and sociodemographic variables as predictors of success for micro-and small-scale business owner in Zambia. In *Success and Failure of Microbusiness Owners in Africa: A Psychological Approach*. Greenwood.
- Lamberti, L., & Noci, G. (2006). From management accounting to strategic management accounting in the public sector: Balanced Scorecard for e-government projects. *Nuove Tecnologie in Medicina: Applicazioni Informatiche E Telematiche in Medicina Anno*, 6(4), 3–9.
- Mikalef, P., Boura, M., Lekakos, G., & Krogstie, J. (2019). Big data analytics and firm performance: Findings from a mixed-method approach. *Journal of Business Research*, 98, 261–276. doi:10.1016/j.jbusres.2019.01.044
- Ministry Commerce, Information Technology and Communication Center. (2021). *Export (Included Re-Export)*, [online]. Trader Report. <http://tradereport.moc.go.th>
- Noordin, R., Zainuddin, Y., & Tayles, M. (2009). Strategic Management Accounting information elements: Malaysian evidence. *Asia-Pacific Management Accounting Journal*, 4(1), 17–34.

Oboh, C., & Ajibolade, S. (2017). Strategic management accounting and decision making: A survey of the Nigerian Banks. *Future Business Journal*, 3(2), 119–137. doi:10.1016/j.fbj.2017.05.004

Polit, D., & Beck, C. (2012). *Nursing research: Generating and assessing evidence for nursing practice* (9th ed.). Wolters Kluwer Health/Lippincott Williams & Wilkins.

Polit, D. F., & Beck, C. T. (2006). The content validity index: Are you sure you know what's being reported? Critique and recommendations. *Research in Nursing & Health*, 29(5), 489–497. doi:10.1002/nur.20147 PMID:16977646

Porter, M. E. (1980). *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. Free Press.

Porter, M. E. (1985). *Competitive Advantage*. The Free Press.

Rashid, M., Ali, M. M., & Hossain, D. M. (2021). Strategic management accounting practices: A literature review and opportunity for future research. *Asian Journal of Accounting Research*, 6(1), 109–132. doi:10.1108/AJAR-06-2019-0051

Ray, G., Muhanna, W. A., & Barney, J. B. (2005). Information Technology and performance of the customer service process: A resource based analysis. *Management Information Systems Quarterly*, 29(4), 625–651. doi:10.2307/25148703

Roslender, R., & Hart, S. J. (2003). In search of strategic management accounting: Theoretical and field study perspectives. *Management Accounting Research*, 14(3), 255–279. doi:10.1016/S1044-5005(03)00048-9

Simmonds, K. (1981). Strategic management accounting. *Management Accounting*, 59, 26–29.

Smith, M. (2000). Strategic Management Accounting: The public sector challenge. *Magazine for Chartered Management Accountants*, 78(1), 40–42.

Sowcharoensuk, C. (2019). Industry Outlook 2019-2021: Rice Industry. *Krungsri Research*. <https://www.krungsri.com/en/research/industry/industry-outlook/agriculture/rice/io/io-rice-20>

Torres, L., Pina, L., & Acerete, B. (2005). E-government developments on delivering public services among E.U.cities. *Government Information Quarterly*, 22(2), 217–238. doi:10.1016/j.giq.2005.02.004

Wade, M., & Hulland, J. (2004). The resource-based view and information systems research: Review, extension, and suggestions for future research. *Management Information Systems Quarterly*, 28(1), 107–142. doi:10.2307/25148626

APPENDIX

Section 1.

Personal information of accounting managers or directors and companies' information

Instructions: Please use ✓ to indicate one choice that is the most accurate according to you.

1. Gender ☐ 1. Male ☐ 2. Female
2. Age ☐ 1. Less than 30 years old ☐ 2. 30–40 years old
 ☐ 3. 41–50 years old ☐ 4. More than 50 years old
3. Education ☐ 1. Lower bachelor's degree
 ☐ 2. Bachelor's degree
 ☐ 3. Master's degrees
 ☐ 4. Higher than a master's degree or Ph.D.
4. Works experience
 ☐ 1. Less than 5 years ☐ 2. 5–10 years
 ☐ 3. 11–15 years ☐ 4. More than 15 years
5. Current operation capital
 ☐ 1. Less than 25,000,000 Baht
 ☐ 2. 25,000,000–50,000,000 Baht
 ☐ 3. 50,000,001–100,000,000 Baht
 ☐ 4. 100,000,001–150,000,000 Baht
 ☐ 5. More than 150,000,000 Baht
6. Operational years
 ☐ 1. Less than 5 years ☐ 2. 5–10 years
 ☐ 3. 11–15 years ☐ 4. More than 15 years

Questionnaire

The title “Strategic Management Accounting on Competitive Advantage”

Section 2.

Opinion on business strategy

Instructions: Please use ✓ to indicate one choice that is the most accurate according to you						
Items	Questions	Level of Agreement				
		Strongly agree	Agree	Not sure	Disagree	Strongly disagree
		5	4	3	2	1
1.	The company produces enough products to meet the needs of customers.					
2.	The company has a strategy for production planning and production control appropriately.					
3.	The company reduces labor costs and production costs that are not worth the operation.					
4.	The company has a strategy that is suitable for the current situation in order to satisfy customers.					
5.	The company has reduced marketing costs by using a network or creating various communication channels per the situation.					
6.	The company reduces the price of products when customers order each time a large number of products.					
7.	The company has a strategy to reduce inventory/inventory volume to reduce storage space and reduce administrative costs.					

Section 3.
Opinion on big data analytics

Instructions: Please use ✓ to indicate one choice that is the most accurate according to you.						
Items	Questions	Level of Agreement				
		Strongly agree	Agree	Not sure	Disagree	Strongly disagree
		5	4	3	2	1
1.	Analyzing data from Big Data will increase your potential and operational efficiency.					
2.	Data analytics provides a wide range of well-rounded and up-to-date information that can be used for in-depth analysis, resulting in accurate, clear, accurate, and to-the-point decision-making.					
3.	Data analytics provides a comprehensive and up-to-date variety of information that can be used for true cost analysis.					
4.	Data analytics provides visualization of data in an easy-to-understand format, bringing relevant information to planning and control.					
5.	Data analytics can handle data in depth, making it possible to efficiently select complex and difficult predictive analytics methods.					
6.	Analyzing data to find correlations can help to make the presentation of information more reliable.					

Section 4.
Opinion on strategic management accounting

Instructions: Please use ✓ to indicate one choice that is the most accurate according to you						
Items	Questions	Level of Agreement				
		Strongly agree	Agree	Not sure	Disagree	Strongly disagree
		5	4	3	2	1
Activity-Based Costing						
1.	Management accounting information can clearly and appropriately define production activities.					
2.	Management accounting information can set criteria for cost drivers in accordance with production activities.					
Target Costing						
3.	Management accounting information helps plan activities in new products to meet profit targets.					
4.	Management accounting information is an important tool in creating collaboration instead of competing in the market and can reduce costs. Build good relationships with customers.					
Benchmarking						
5.	Management accounting information helps increase operational efficiency, such as reducing production time, waste, etc.					
6.	Management accounting information, together with other information, can be used to analyze the position of the business and improve operations.					
Competitive Position Monitoring						
7.	Management accounting and other information can analyze competitive positions and strategic advantages.					
Customer Accounting						
8.	Management accounting information can offer value to customers.					
9.	Management accounting information helps to formulate a marketing plan that aligns with customer needs.					

Section 5.**Opinion on competitive advantage**

Instructions: Please use ✓ to indicate one choice that is the most accurate according to you.						
Items	Questions	Level of Agreement				
		Strongly agree	Agree	Not sure	Disagree	Strongly disagree
		5	4	3	2	1
1.	The price of the company's products is lower than that of competitors in the same market.					
2.	The company uses high-quality and modern production machines, resulting in the least loss.					
3.	The company's resource procurement is sufficient, appropriate, and timely, thus saving time and relevant costs.					
4.	Efficient procurement and resource utilization for minimum cost					
5.	The company can set prices for products or services that attract customers at different prices than others in the same market.					
6.	The company differentiates its products and services from competitors and creates maximum customer satisfaction.					
7.	The company is able to create new products and/or services with quality that meet the needs and gain acceptance from customers.					
8.	The company can introduce products to the market faster than other competitors.					
9.	The company has the technology to provide trading services to customers.					
10.	The company maintains a good and close relationship with customers to respond to changing customer needs in a timely manner.					
11.	The company is able to respond continuously to the needs of each group of customers, causing customers to come back to buy products again.					
12.	The company can accurately respond to the needs of customers in terms of products, resulting in always being impressed by customers.					
13.	The company's market share has increased due to the persistence of existing customers and the continued increase of new customers.					

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