# The Causal Structural Relationships between Accounting Information System Quality, Supply Chain Management Capability, and Sustainable Competitive Advantages of Maize

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***Abstract*- This research aims to (1) investigate influence of accounting information systems on supply chain management capability of maize, (2) study influence of supply chain management capability on sustainable competitive advantages of maize in Tak special economic zone (Tak SEZ), and (3) examine influence of accounting information systems on sustainable competitive advantages of maize. The data was collected from samples of 580 households by using questionnaires. The data was analyzed by descriptive statistics and structural equation modeling (SEM). It was found that factors have relational influence on the others. Accounting information system quality has positive influence on supply chain management capability in terms of customer relationship, manufacturing flow management, procurement effectiveness, and delivery time. Moreover, customer relationship, manufacturing flow management, procurement effectiveness, and delivery time in supply chain management capability have positive influence on sustainable competitive advantages. Accounting information system quality also has positive influence on sustainable competitive advantages. In addition, when considering total influence of endogenous latent variables, accounting information system quality has total influence on sustainable competitive advantages. The findings of this study can be applied to accounting information systems together with supply chains in order to create competitive advantages. According to the Government's policy promoting sustainable agriculture to Thai farmers, safety of both manufacturers and consumers is encouraged to reduce cost and increase the quantity of products.**

***Keywords;*** *Accounting Information System Quality, Supply Chain Management Capability, Sustainable Competitive Advantages, Maize.*

## 1. Introduction

Maize is a crucial economic plant widely cultivated all over the world as it is ranked fifth among ten plant species in the world market. Information of the world market during 1994 - 2016 indicates tendency of increase in maize production with the highest proportion of 52.9% in the Americas and the second-highest proportion of 28.5% in Asian countries [12].

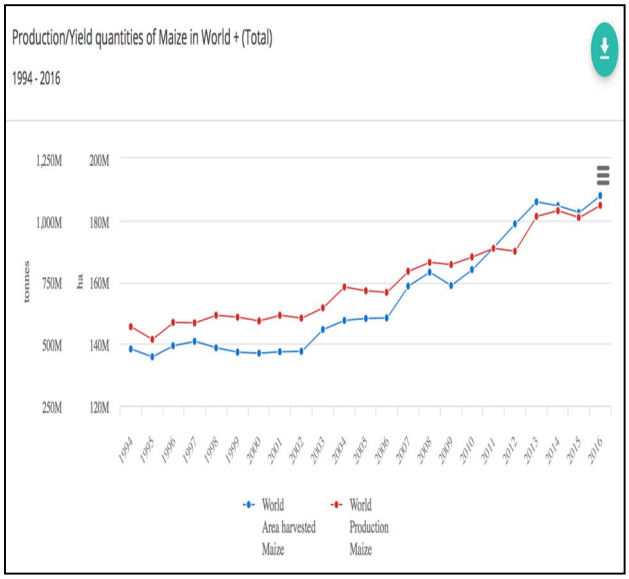


**Figure 1.** Production/Yield Quantities of Mize in World (Source: [12])

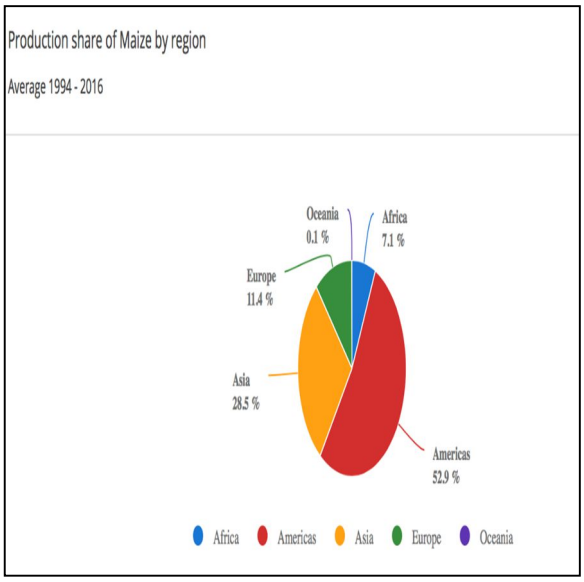


**Figure 2.** Production Share of Mize by Region (Source: [12])

Thailand is a part of global market for maize cultivation. Maize is an important economic plant which is a source of food production for livestock and a vital basis for Thailand to become the world's kitchen including its processed products such as fuel, oil, and plastic [46]. Its market demand during 2011/12 - 2015/16 tended to increase from 885.04 million tons in 2011/12 to 958.52 million tons in 2015/16 or rose by 2.90% per year. For export value of animal feed to foreign markets during 2011/12 - 2015/16, export amount tended to increase from 0.32 million tons with value of 2.95 million baht, in 2011/12 to 0.22 million tons with value of 1.88 million baht in 2015/16 or rose by 11.44% and 8.74% per year respectively. Major markets exporting maize are China, Philippines, Vietnam, and Indonesia. In 2015/16 until 2017, however, export amount decreased because many countries began to reduce quantity of imported maize from Thailand which made the competition even more intense. Many countries such as China, Vietnam, Indonesia and Philippines began to export maize [5] because planted areas were getting smaller and there were other products substituting production of maize. The competition was getting more intense and other countries also had more ability in planting maize. As a result, selling price was not attractive to farmers, especially for the first four months of 2017. Big manufacturing countries such as the United States and Brazil had produced more maize leading to price pressure [ 2 7 ] . For Tak special economic zone (Tak SEZ), Mae Sot Estate Cooperative Limited was founded in Mae Sot District. As the Ministry of Agriculture and Cooperatives aims to have 16 estate cooperatives all over the country joining a project to establish a food plant and renewable energy plant estate for cultivating maize, Mae Sot Estate Cooperative is one of the four estate cooperatives selected by Cooperative Promotion Department to be a pilot estate cooperative because its several aspects are ready. Most of the areas are in irrigation zones with natural water resources flowing through and most of the cooperative members are farmers who mainly plant maize for a living.

To become a part of world trade forum and a major exporter, Thailand must adjust business process by analyzing strengths, weaknesses, opportunities, and threats (SWOT) to obtain a guideline for internal and external management. In addition, it has to create network competition among experts and utilize the membership of ASEAN to establish a market and mutual production base for higher competitive advantages. A research about aromatic coconuts supply chain management using mixed-integer linear programming of [33] said that manufacturers have to find methods to fulfill customer satisfaction to compete against business rivals and to ensure survival of their businesses. Thus, many business owners started to pay attention to supply chain management because activities occurring on the supply chain management can reduce the least cost of operations in total [33] and enhance competitive ability of proactive businesses. Farmers will be able to run their agricultural businesses effectively with self-dependence [ 1 ] which conforms to an economic development plan that focuses on getting ready for changes, knowing the world's situations, and building self-immunity according to the philosophy of Sufficiency Economy [20]. As a result, in order to strengthen potential of supply chains based on the recent business environment, information technology suitable for business organizations and operation forms must be used. All activities occurring on the line of supply chains cost expenses. If there is good administration of these activities, production-related expenses will be lower and the cost of production will also be decreased.

According to government policies of Prime Minister Prayuth Chan-ocha, he realizes the importance of sustainable agriculture for Thai farmers by encouraging agricultural activities that are safe for both producers and consumers. He also supports procedures to reduce production cost and increase products to create agricultural sustainability. Agricultural sector itself should pay more attention to application of technology in agricultural systems as it enables development of Thai agricultural aspect. Accordingly, many sectors emphasize and promote innovation and technology in adding more value to agricultural products. They obtain useful information for management of several dimensions and advance themselves to be smart farmers [2 7 ]. Therefore, in part of accounting information systems get involved and support activities of supply chains because they are parts of information systems in the organization. An accounting information system consists of (1) people (2) procedures (3) data (4) software (5) information technology infrastructure (6) internal controls and security. These six components altogether have major roles in creating necessary information for decisions making of the users [9]. Furthermore, products and services can be improved by enhancing quality, reducing cost, and adding more forms of products as wanted [2]. Those methods establish a connection between activities on supply chains from finding raw materials of products and services to providing effective just-in-time delivery and enable the coordination of business practices that covers from material suppliers through an industrial business system to consumers. Product value is added and

the products themselves are presented to last consumers to create sustainable competitive advantages.

Although technology plays a crucial role in every section, literature reviews on relations between quality of accounting information systems, effective supply chain management, and establishment of competitive advantages in agricultural context of Thailand and foreign countries are still limited. Most studies are related to effective information system and competitive advantages establishment in industrial context. This study, therefore, focuses on accounting information systems that help collect data and process both financial and non-financial information useful for supporting main activities on supply chains, creating new strategies for strengthening sustainable competitive advantages, and adding value to maize planted in Tak SEZ to equal one from different countries in ASEAN and world trade forum.

## 1.1. Research Objectives

1. To investigate influence of accounting information systems on supply chain management capability of maize in Tak SEZ.
2. To study influence of supply chain management capability on sustainable competitive advantages of maize in Tak SEZ.
3. To examine influence of accounting information systems on sustainable competitive advantages of maize.

# 2. Literature Reviews

## 2.1. Concepts of Accounting Information Systems

For concepts of accounting information systems, [6] stated that the accounting information system is a subsystem related to financial and nonfinancial transactions and consists of three smaller subsystems which are the transaction processing system (TPS), the financial reporting system (FRS), and the management reporting system (MRS) while [7] gave a definition of the accounting information system that it is a system collecting, recording, keeping, and processing data to get useful information for making a decision. In addition, [8] defined that the accounting information system is a system that helps collect data and process data to create necessary information for the users. The accounting information, thus, is a part of the organization's information system which collects and processes financial and nonfinancial data. In other words, the accounting information system is not only exclusive to financial accounting, but also inclusive of managerial accounting which is able to add more value to business and customers in the future. To sum up the concepts above, the accounting information is a part of the organization's information system. It is composed of humans, work procedures, data, software, information technology infrastructure, and internal controls and security. These components together have main duties (1) to collect, record, save, and edit business events in the form of transactions or business activities as financial and nonfinancial transactions. After that, the business events are brought to (2) the processing of saved data to create information useful for making decisions, planning, and commanding. Also, the components are responsible for (3) security of data as a type of business asset equivalent to others and at the same time guarantee the accuracy, completeness, and reliability of the data. Another duty is to create necessary information ready for users to use in decisions making. Accordingly, accounting information system quality in this study has to represent good characteristics of information as being relevant, reliable, complete, accurate, clear, concise, timely, easy to understand, accessible, verifiable, worthy, flexible, and safe [3,4,35, 45,63,11,10].

## 2.2. Concepts of Supply Chain Management

To run a successful business, one must build a relationship between businesses based on the supply chain. The supply chain is a process linking between manufacturers and customers in terms of materials, data, and cost. There are several sections on the supply chain including material producers, processing plants, product distributors, warehouses, middlemen, and retailers [50,5]. Supply chain management thereby is compilation and cooperation of every section and activity on the chain to be consistent with products processing and flowing of materials until delivery to consumers [16]. It is comprised of several procedures in which every step, whether directly or indirectly, affects customer satisfaction by the combination of conventional business strategies related to internal management and strategic alliance to build a relationship with other organizations on the supply chain (Council of Logistics Management, refer to [5]. Council of Supply Chain Management Professional [11] claimed that supply chain management is a series of activities concerning the practice of supplying materials for products manufacturing and activities related to coordination of relevant sections within the chain. In addition, [9] demonstrated that their supply chain management is a procedure with collaboration and coordination between material suppliers, manufacturers, products stocking, and shops in order to produce and deliver products in accurate quantity to the right place at the right time with the lowest cost. Yet, customer satisfaction must be created and their needs must be fulfilled. Application of the concepts of supply chain management enables effectiveness of the operation under competition with lower expenses and operation cost. It also has advantages on every section of the supply chain. From the perspective of this research, agricultural products, especially maize in Mae Sot as a special economic zone, should be motivated and introduced to the ideas of supply chain management in order to create competitive advantages. The supply chain management is an integrated process that involves planning, procuring, manufacturing, shipping, and returning products. Furthermore, it includes the construction of the organization's operation strategies to create workflow and related information in order to lower the overall cost to a minimum while reaching the highest consumer satisfaction resulting in sustainable competitive advantages [10]. Additionally, previous research projects found that obtaining quality information, sharing information together, having a good relationship with other parties on the supply chain, and building customer

relationship can lead to competitive advantages [59,25, 2, 23].

Previous studies about supply chain management focused on the combination of administrative activities and mechanism of supply chains based on business characteristics. This research, thus, synthesizes administrative activities to develop the quality of supply chain management in four aspects. The first aspect is customer relationship (CR) which concerns activities related to customer relationship management as activities to improve relationships with customers and customer services that support and encourage long-term customer loyalty towards products. It also involves creating ultimate customer satisfaction, getting products that meet customer needs ready for sale, and administrating good service delivery to customers [32, 7,47,53, 44,51,57]. The second aspect is manufacturing flow management (MFM). It claimed that supply chain management quality highlighted the exchange of communicated data between the supply chain and the support from external sections. Practices in the supply chain are active and flexible. There are production management, communication system and technology management, and good relationships with an alliance on the supply chain [42,6]. An alliance and supply chain management are related as previous studies found that a business alliance is a crucial key to build a good long-term relationship. Willingness and keeping promises have influence on support and collaboration on the supply chain which later affect the quality of supply chain management [28,12,41].

The third aspect is procurement effectiveness (PE). It is the practice related to procuring and material supply cost [51], selecting material suppliers, specifying standards of procuring and supplying materials. The last aspect is delivery time (DT). For this research, supply chain management quality in terms of delivery time is significantly important. It is related to logistics management, establishing a good relationship with suppliers, product distribution management, effectiveness and speed of delivery, risk management of transportation [6, 51] geographic proximity, and capability of just-in-time performance [50].

## 2.3. Competitive Advantages

Porter [43] claimed that the competitive advantage is an ability of organizations making more profit than their business rivals and an important goal of every business is an ability to develop the sustainable competitive advantage. The competitive advantage occurs when the organization is able to satisfy customer needs equally with lower cost or able to fulfill the needs differently and better than the rivals. The competitive ability itself can build a more impressive image in customers' eyes. Similarly, [18] studied and supported the theory of establishing competitive abilities as they demonstrated that the indication of the organization's competitive ability is that the organization can earn more profit than average profit standards of other organizations with the same businesses and the organization is able to present higher value to customers. The principal aim is to maintain long-term competitive advantages and every activity on the value chain is a tool leading to competitive abilities in cost leadership and identity creation. [43] and [18] applied the concepts of value chains to the value chain that consists of basic activities and supportive activities to establish value of products. [39]; [62]; [32]; [29], likewise, described about creating competitive abilities for industries that the competitive ability occurs from creating value for customers via activities on the value chain. To develop and maintain competitive abilities of the business, one must study and fulfill customer needs as well as presenting products accessible to customers. Moreover, [40] said that competitive advantage will be enhance when performance measurement capabilities are valuable. In addition, developing technology, creating new innovations, seeking opportunities constantly to establish competitive abilities, investing to maintain the sustainable competitive advantages, and running the business effectively are necessary in order to administer the lower cost, higher quality, faster fulfillment, and better services. Moreover, [23] stated that Supply chain quality integration system has attained a significant attention over the world that allow firms to strategically collaborate its external and internal supply chain processes in order to obtain high level quality and competitive performance. However, Thai agricultural sectors have planned development strategies for sustainable agriculture. For this reason, this study underlines four aspects of sustainable competitive advantages, based on concepts of scholars mentioned above, which are (1) income growth, (2) value creation and quality of products for customers, (3) competitive advantages in terms of price (cost), and (4) reliable product delivery.

A literature review above determines a research framework. This research employs structural equation modeling or SEM, which is advanced statistics used for data analysis with advantages as follows. To start with, it is a combination between multiple regression analysis, path analysis, and factor analysis. Moreover, it is an analysis model and a research model at the same time. It is a popular instrument widely used by several researchers as it suits research in social science. Most variables in social science are abstract and they are called latent variables. Researchers must measure latent variables concretely so they become observable variables. Furthermore, studies of relations between variables in social science are more complicated and profound. A key element of SEM is structural model representing causal relationship between external and internal variables which are recursive and linear additive, or non-recursive and linear additive. The other key element is measurement model demonstrating relationship between latent and observable variables. Therefore, SEM depicts factor analysis and path analysis. Verification and testing of congruence between constructed model and empirical data are indicated by congruence measurement statistics of [14]. SEM is a process of statistical analysis to find out the inter-relationship between multiple variables and there are several options of software to analyze SEM such as AMOS, LISREL, SEPATH, PRELIS, SIMPIS, MPLUS, EQS and SAS [13].

So, Structure Equation Model in this study which depicts accounting information systems as resources and potential of useful financial and nonfinancial information that is

able to reduce cost and earn profit from businesses. It is a crucial instrument for business competition as it changes characteristics of operations, utilizes assets for more benefits, develop supply chain management quality, and serves as a process foundation of cooperation between material suppliers, manufacturers, distributors, and customers. Resources and quality of accounting information systems are transferred to supply chain management capability and further affect sustainable competitive advantages as shown in figure 3.

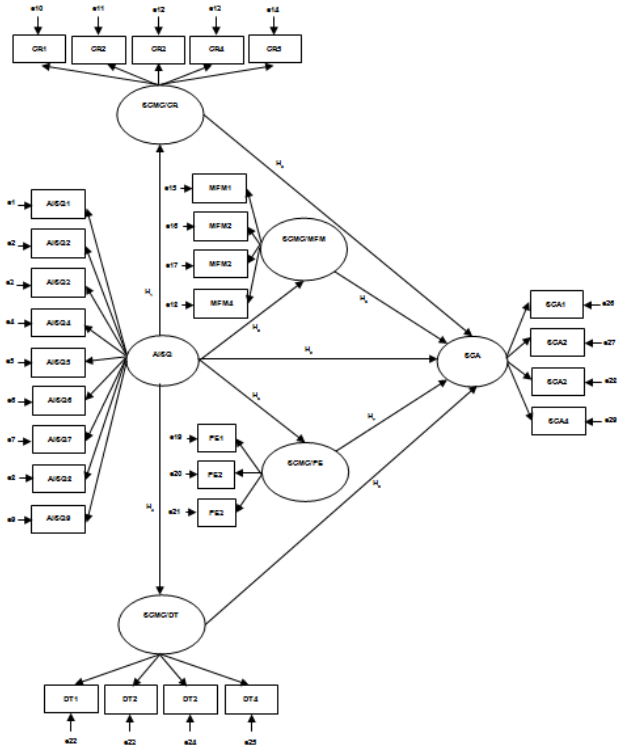


**Figure 3.** Conceptual Framework

Where; AISQ stands for Accounting Information System Quality.

SCMC/CR stands for Supply Chain Management Capability for Customer Relationship.

SCMC/MFM stands for Supply Chain Management Capability for Manufacturing Flow Management.

SCMC/PE stands for Supply Chain Management Capability for Procurement Effectiveness.

SCMC/DT stands for Supply Chain Management Capability for Delivery Time.

SCA stands for Sustainable Competitive Advantage.

Therefore, from the perspective of this research, agricultural products, especially maize in Tak SEZ, should be motivated and introduced to the ideas of four aspects of supply chain management capability in order to create competitive advantages and decrease the total cost to a minimum. Moreover, it involves integrating, planning, supplying, producing, shipping, and returning of products as well as planning operational strategies to enable workflow from related information. Establishing the highest customer satisfaction is also included in order to develop sustainable competitive advantages [48]. Additionally, previous research projects found that obtaining quality information, sharing information together, having a good relationship with other parties on the supply chain, building customer relationship, coordinating with business partners the same way as pieces linked together on a chain, and managing supply chain effectively can lead to competitive advantages of businesses in the long run [59, 25, 2, 41].

## 3. Research Methodology

### 3.1. Population and Samples

The population of this research is 21,151 households of maize farmers in Tak SEZ [8]. For samples, the researcher has considered suitability of data analysis by Statistical Package for Social Science (SPSS)-AMOS; therefore the specified amount is 10 - 20 people per observable variable which conforms the rule of thumb [14]. The entire samples of this research are 580 households of maize farmers selected, by snowball sampling, from Mae Sot Estate Cooperative Limited member network. For collected data, there are 568 questionnaires (97.41%) completely filled out for data analysis. Data was gathered from members of Mae Sot Estate Cooperative Limited because they received support for development of potential in production, marketing, and services. They also participated in driving government policies and performed business under the law. As a result, using questionnaires to collect data from them by snowball sampling could reach maize farmers who were willing to answer questions honestly. The questionnaires were completely answered and it also reduced faults from bias and response errors. Therefore, the chosen farmers are considered good representation of the research.

### 3.2. Research Tools and Quality Assurance of Research Tools

The researcher collected data to answer hypothesis questions by questionnaires. For quality assurance of research tools, content analysis was performed by three experts who examined accuracy, clarity of language, content coverage, and coherence between questions and objectives to calculate index of congruency (IOC). The questionnaires were revised based on experts' advice and then tested on non-samples of 50 people to find item-total correlation. After that, score selection was performed to analyze reliability of the questionnaires. Moreover, composite reliability was calculated to check reliability level of the set of observable variables that measure structural latent variables. Average variance extracted was also calculated to find out error variance which is lower than the variance of observable variables. Several calculations were performed to find out whether or not the measurement model of this research has acceptable level of structural reliability.

## 3.3. Statistics for Data Analysis

1 General data analysis uses descriptive statistics including elementary statistics for general data such as average, standard deviation, frequency, and percentage.
2 An analysis of structural equation modeling (SEM) is to test hypotheses.

## 4. Research Results

Table 1 shows that quality assurance of research tools began with content analysis. The tools were sent to three experts to examine accuracy, clarity of language, and coherence between questions and objectives to calculate index of congruency (IOC). The result of assessment from three experts is between 0.69 - 0.97 which meets the criteria and correction of the tools has been proceeded based on the experts' recommendations. Then, the corrected tools were tested by using on non-samples of 50 people to find item-total correlation with score more than 0.4 [17] and score selection has been performed to analyze reliability of the questionnaires as shown in Table 1. It was found that reliability has Cronbach's alpha coefficient between 0.85-0.96. As it exceeds 0.7, it represents that every component is at an acceptable level of reliability [36]. In addition, composite reliability is between 0.87 - 0.95 which is more than 0.7, thereby indicating that the set of observable variables can measure structural latent variables with high reliability. Furthermore, average variance extracted is between 0.49 - 0.58 which is higher than 0.4. Accordingly, it shows that error variance is lower than the variance of observable variables. To sum up, the measurement model of this research has good structural reliability.

**Table 1.** The Analysis of Structural Reliability

| Variable | Question | Item-Total Correlation | Alpha Coefficient | Composite Reliability | Average Variance Extracted |
|---|---|---|---|---|---|
| Accounting Information System Quality (AISQ) | 9 | 0.73 - 0.79 | 0.96 | 0.88 | 0.52 |
| $AISQ_1$ | | 0.73 | | | |
| $AISQ_2$ | | 0.76 | | | |
| $AISQ_3$ | | 0.78 | | | |
| $AISQ_4$ | | 0.78 | | | |
| $AISQ_5$ | | 0.74 | | | |
| $AISQ_6$ | | 0.75 | | | |
| $AISQ_7$ | | 0.76 | | | |
| $AISQ_8$ | | 0.79 | | | |
| $AISQ_9$ | | 0.74 | | | |
| Supply Chain Management Capability for Customer Relationship (SCMC/CR) | 5 | 0.55 - 0.66 | 0.92 | 0.89 | 0.56 |
| $CR_1$ | | 0.55 | | | |
| $CR_2$ | | 0.65 | | | |
| $CR_3$ | | 0.62 | | | |
| $CR_4$ | | 0.66 | | | |
| $CR_5$ | | 0.55 | | | |
| Supply Chain Management Capability for Manufacturing Flow Management (SCMC/MFM) | 4 | 0.54 - 0.63 | 0.85 | 0.86 | 0.58 |
| $MFM_1$ | | 0.63 | | | |
| $MFM_2$ | | 0.60 | | | |
| $MFM_3$ | | 0.54 | | | |
| $MFM_4$ | | 0.58 | | | |
| Supply Chain Management Capability for Procurement Effectiveness (SCMC/PE) | 3 | 0.66 - 0.72 | 0.92 | 0.86 | 0.49 |
| $PE_1$ | | 0.71 | | | |
| $PE_2$ | | 0.72 | | | |
| $PE_3$ | | 0.66 | | | |
| Supply Chain Management Capability for Delivery Time (SCMC/DT) | 4 | 0.60 - 0.78 | 0.90 | 0.84 | 0.52 |
| $DT_1$ | | 0.67 | | | |
| $DT_2$ | | 0.60 | | | |
| $DT_3$ | | 0.78 | | | |
| $DT_4$ | | 0.69 | | | |
| Sustainable Competitive Advantage (SCA) | 4 | 0.71 - 0.75 | 0.95 | 0.87 | 0.51 |
| $SCA_1$ | | 0.70 | | | |
| $SCA_2$ | | 0.75 | | | |
| $SCA_3$ | | 0.71 | | | |
| $SCA_4$ | | 0.72 | | | |

An analysis of the causal factor model's fit index of accounting information system quality, supply chain management capability, and sustainable competitive advantages is indicated by the index examining absolute quality of fit measure [31] using specified criteria. The model is concordant with empirical data of [14] and [17] collected from samples as presented in Table 2. When considering criteria of every key performance indicator, the empirical data and the factor analysis model are perfectly goodness-of-fit.

**Table 2.** Results of Analysis of Model Goodness-of-Fit

| Quality of fit measure | Model's Fit Based on Criteria | Statistics | Results |
|---|---|---|---|
| Chi-square/df | Less than 3.00 | 1.82 | Passed |
| p-value of Chi-square | More than 0.05 | 0.24 | Passed |
| GFI | More than 0.90 | 0.98 | Passed |
| AGFI | More than 0.90 | 0.96 | Passed |
| CFI | More than 0.90 | 0.98 | Passed |
| RMSEA | Less than 0.05 | 0.02 | Passed |

(Criteria recommended value refers to [31])

Table 2 presents statistics of goodness of fit and component analysis model. It consists of Chi-square that evaluates consistency between the model and data. The calculated value is 1.82, which is less than 3. It shows that the model is fit for the empirical data at an acceptable level [15]. In addition, the fit between data and model is indicated by GFI, AGFI, and CFI. They are all more than 0.9 and it demonstrates that the model is compatible with empirical data [14]. RMSEA is also popular for measurement of the fit between model and empirical data. The calculated value is 0.02, which is less than 0.05. It is at an acceptable level; therefore, the model is consistent with empirical data [14].

**Table 3.** Demographic Characteristics of Respondents

| Descriptions | Categories | Frequencies | Percent (%) |
|---|---|---|---|
| Gender | Male | 428 | 75.35 |
| | Female | 140 | 24.65 |
| Age | Less than 40 years old | 39 | 6.87 |
| | 40-45 years old | 191 | 33.63 |
| | 46-50 years old | 203 | 35.74 |
| | More than 50 years old | 135 | 23.76 |
| Marital Status | Single | 8 | 1.41 |
| | Married | 550 | 96.83 |
| | Divorced | 10 | 1.76 |
| Education Level | Lower that bachelor's degree | 221 | 38.91 |
| | Bachelor's degree | 347 | 61.09 |
| Years of planting | 5-10 years | 147 | 25.88 |
| | 11-15 years | 297 | 52.29 |
| | More than 15 years | 124 | 21.83 |
| Average revenue per month | 25,000-40,000 Baht | 197 | 34.68 |
| | 40,001-55,000 Baht | 357 | 62.85 |
| | More than 55,000 Baht | 14 | 2.47 |

Table 3 presents demographics of respondents who are maize farmer households answering all questions in the questionnaire. Of the 568 participants with returned questionnaires, about 75.35 percent of respondents are male and the rest are female. In terms of age, 35.74 percent are 46-50 years old and 33.63 percent are 40-45 years old. For marital status, 96.83 percent are married, 1.41 percent are single and the rest are divorced. The highest education level is bachelor's degree which covers 61.09 percent of respondents while 38.91 percent are lower than bachelor's degree. For years of planting, 52.29 percent are between 11-15 years and 25.88 percent are between 5-10 years. In terms of average revenue per month, 62.85 percent of respondents are between 40,001-55,000 baht.

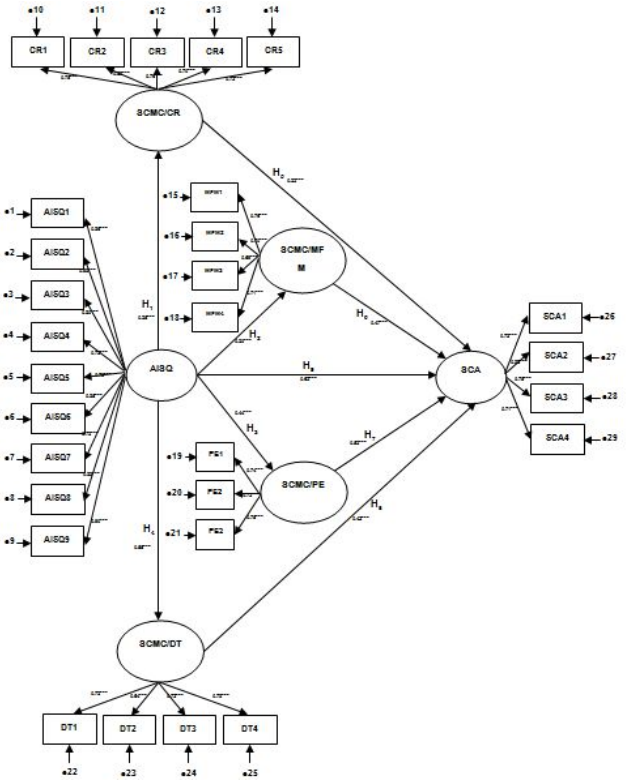


**Figure 4.** Testing Results of Structural Equation Modeling

Figure 4 demonstrates Influence of relationships between latent variables with standard coefficients and relationships between latent variables and observable variables can be observed by factor loadings. The factor loading of every variable has statistical significance ($p<0.01$) between 0.70-0.98 implying that the model can explain the variation of variables properly [36]. Latent variables of accounting information system quality were measured with nine observable variables and AISQ2 (accounting information system quality in terms of reliability) is an observable variable with the highest factor loading (0.98). Latent variables of supply chain management capability in terms of customer relationship were measured with five observable variables and CR2 (fulfilling customer needs) is an observable variable with the highest factor loading (0.88). Similarly, latent variables of supply chain management capability in terms of manufacturing flow management were measured with four observable variables and MFM1 (process agility) is an observable variable with the highest factor loading (0.76). Latent variables of supply chain management capability in terms of procurement effectiveness were measured with three observable variables and PE3 (procurement cost) is an observable variable with the highest factor loading (0.75). Latent variables of supply chain management capability in terms of delivery time were measured with four observable variables and DT4 (effectiveness and quickness) is an observable variable with the highest factor loading (0.78). Latent variables of sustainable competitive advantages were measured with four observable variables and SCA2 (value creation and product quality for customers) is an observable variable with the highest factor loading (0.82). Moreover, figure 2 depicts analysis of influence of relationships between

variables where accounting information system quality has positive influence on supply chain management capability in terms of customer relationship ($\beta = 0.35$, $p<0.01$), manufacturing flow management ($\beta = 0.30$, $p<0.01$), procurement effectiveness ($\beta = 0.44$, $p<0.01$), and delivery time ($\beta = 0.55$, $p<0.01$) (Hypotheses $H_1$-$H_4$ accepted). In addition, supply chain management capability in terms of customer relationship, manufacturing flow management, procurement effectiveness, and delivery time have positive influence on sustainable competitive advantages ($\beta = 0.33$, $p<0.01$; $\beta = 0.47$, $p<0.01$; $\beta = 0.53$, $p<0.01$; $\beta = 0.42$, $p<0.01$ respectively) (Hypotheses $H_5$-$H_8$ accepted). Accounting information system quality also have positive influence on sustainable competitive advantages ($\beta = 0.62$, $p<0.01$) (Hypothesis $H_9$ accepted). Furthermore, when considering total influence of endogenous latent variables, it was found that accounting information system quality has the highest total influence on sustainable competitive advantages (0.66).

## 5. Conclusion and Discussion

According to the analysis of the model's concordance based on the model is fit for empirical data of [14] and [17], the model is concordant with empirical data which assures causal factors of accounting information system quality having positive influence on supply chain management capability. The finding has mentioned the accounting information system as a part of the information system where the accounting information system quality carry out major responsibilities in collecting, recording, keeping, and editing business events in forms of transactions or business activities inputted to the processing of saved data to be useful information for making decisions, planning, and commanding. The accounting information system quality also controls the security of data as a form of business asset equivalent to others and, at the same time, guarantees the accuracy, completeness, and reliability of the data. Another responsibility of it is to create necessary information which can be taken into account when users need to make decisions and this corresponds to the research of [28] investigating relationships between information systems and success factors of supply chain management of auto part factories. It was found that the information system has influence on success factors of supply chain management and information systems used in most factories is ERP which are parts of accounting information systems. This research's findings also correspond to an academic journal stating that in order to manage supply chain effectively, it is necessary to have an accurate, complete, and quick data-link system. Another factor to complete the supply chain management is to make use of technology such as Electronic Data Interchange (EDI) and communication through internet which is nowadays extremely popular. [20] is similar to [19] as it found that information technology for planning is the most important aspect in supply chain management as it consists of (1) material requirements planning (MRP), (2) enterprise resource planning (ERP), and (3) advanced planning and scheduling (APS). As you can see, both MRP and ERP are systems within accounting information systems. Application of information technology for communication, presentation, practical uses, and database in the study of [26] also affects logistics cost. However, previous studies have discovered about logistics management as an activity in supply chain management. [30] claimed that effective logistics administration occurs from several factors including quantity of products, operation duration, quality, and fixed and variable costs. Data about cost is information derived from the accounting information system. Although ERP is a system used with industrial sector, farmers should adapt and apply accounting information systems, in forms of basic to advanced software and hardware, to their work. It helps in receiving information about cost, accounting, business management and process as well as getting ready to connect and correspond with industrial sector. It also enables expansion of production capacity, boosts up supply chain management potential, and bring data into processing to create useful information for competitive advantages.

Furthermore, as shown in figure 2, the analysis supports that supply chain management capability has positive influence on sustainable competitive advantages reflecting that the supply chain management capability for customer relationship corresponds to the studies of [32]; 7]; [47]; 53]; [44]; [51]; [57]. In terms of manufacturing flow management, the manufacturing corresponds to the studies of [61]; [60]; [38] which mentioned the manufacturing process that creates distinctive products for market presentation, increases the performance of procurement effectiveness and delivery time in order to strengthen sustainable competitive advantages. These findings also correspond to the studies of [59]; [25]; [2]; [41] stating that effective supply chain management can lead to long-term competitive advantages of businesses and quality of accounting information systems has positive influence on sustainable competitive advantages. The finding coincides with the research projects which demonstrated that obtaining quality information, sharing information together, having an alliance on the supply chain, and establishing good relationships with customers enable sustainable competitive advantages [59, 25, 2]. Similarly, [43] and [18] illustrated concepts of value chains comprised of activities creating value for products. [39]; [62]; [32]; [29] described that competitive abilities occur from creating value for customers via activities on the value chain and businesses will be able to establish and maintain sustainable competitive advantages. However, the important finding about the influence of accounting information system quality on sustainable competitive advantages corresponds with studies mentioning about both accounting information system quality and quality of obtained information considered as a well-secured asset of every business. Possessing quality accounting information systems helps improve the overall operation and establish effectiveness in cost allocation. Moreover, building an accounting information system as a part of information technology leads to success in terms of competitive advantages [45, 10, 15, 13]. Likewise, in research of 40] enhance and support in theorized that information technology, business intelligence (BI) effect performance measurement capabilities and turn are positively

associated with competitive advantage. Accounting information systems, thus, have influence on supply chain management capability because those systems help collect data and process both financial and non-financial information to support main activities on supply chains. It later affects supply chain management capability and competitive advantages. Accounting information systems have influence on competitive advantages of maize in Tak SEZ. This result indicates value adding to agricultural sector in Thailand. Previous studies about agricultural sector are limited and findings of this research expand knowledge about competitive advantages outside industrial context and encourage innovative agriculture by applying information technology to create more value for agricultural products. Also, obtaining useful information helps with management of several dimensions and advance to be smart farmers eventually.

## 6. Recommendations and Limitations

### 6.1. Recommendations for Using the Research Results

The findings of this study are an application of knowledge about accounting information systems together with supply chains in order to develop competitive advantages. According to the government policy raised by Thai Prime Minister, General Prayut Chan-ocha, it mainly focuses on sustainable agriculture for Thai farmers to proceed agricultural activities under safety of manufacturers and consumers to decrease cost and increase the quantity of products. Therefore, knowledge from the findings will make farmers realize the importance of obtaining quality information from modern technology. The effective accounting information system leads to activities in supply chain management including customer relationship creation, continuity of manufacturing to invent product's innovations, just-in-time delivery, and procurement of quality materials to strengthen sustainability of competitive advantages in terms of cost, quality products and good responses, income growth, and reliable transportation. Also, farmers in other areas can use the findings as empirical data and apply knowledge to establish sustainability.

### 6.2. Limitations and Future Research Directions

There are limitations in this research. First, the study focuses only in Tak special economic zone (Tak SEZ). In generalization of conceptual model might not apply to other province of Thailand and other countries. Therefore, the researcher should study in other provinces/countries and compare between Thailand and the rest of AEC by collecting data of other countries in AEC. Second, the focus of the research model has been on the relationships among constructs identified in this research. The findings should be viewed with caution insofar as other potentially important factors have been excluded. For another future research, in next studies, accounting information systems should be linked with geography to enable integration of logistics and exporting to neighboring countries based on the vision of Thailand 4.0. Moreover, the researcher should analyze situations when there is price fluctuation and how to establish competitive advantages in such situations by using causal factors from a suitable structural relationship. In addition, should test with agricultural products other than maize, such as rice and tapioca to gain guidelines in creating supply chain management capability and competitive advantages for various products.

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