MAXIMIZING DECISION-MAKING IN STARTUPS: EVALUATING THE EFFECT OF PERCEIVED ACCURACY IN ACTIVITY-BASED COSTING

Daowadueng P.[*]

Abstract: The research investigates the role of Activity-Based Costing (ABC) in improving the decision-making processes of startups in Thailand, considering the role of perceived accuracy. The study addresses several research gaps, including how ABC influences decision-making in the Thai startup context and the significance of perceived accuracy in shaping decision processes, which need more literature investigating the problem to help startups make better decisions and ensure their sustainability. The study utilized the quantitative survey research design method, collecting primary data from the research population consisting of startup founders/CEOs and accountants in Thailand using a structured questionnaire. A sample of 190 respondents was drawn from the study population, whose responses were analyzed using correlation analysis and multiple regression analysis. The results revealed that ABC significantly influences decision-making in Thailand startups. Perceived accuracy also had a significant effect on ABC and partially mediated the impact of ABC on decision-making. The findings indicate that Thai startup owners or managers are willing to use ABC as a costing strategy if they perceive it to provide accurate information in decision-making, indicating its potential to enhance cost efficiency, competitiveness, performance, and firm survival in the startup ecosystem. ABC is a beneficial costing technique for leveraging cost efficiency, competitiveness, high performance, and firm survival for startups. Understanding this is vital for startups to navigate the turbulent business environment encumbered with uncertainties.

Keywords: Activity-based costing, decision-making, startups, financial management, strategic decisions, operations management

Introduction

In the dynamic and competitive landscape of Thailand's startup ecosystem, adopting strategic financial management practices is pivotal for sustaining growth and achieving long-term success. Pfützenreuter (2023) argues that effective cost management in startups is a cornerstone of prudent financial management, which can steer startups toward growth in the dynamic startup market ecosystem. Among the various techniques, Activity Based Costing (ABC) has been considered a crucial tool that offers different insights into the costs associated with multiple business

---

[*] **Piyada Daowadueng**, Dr., PhD, MSc, B Acc., Department of Accountancy, Faculty of Business Administration and Accountancy, Khon Kaen Business School, Khon Kaen University, Thailand;

✉ corresponding author: piyadao@kku.ac.th,
ORCID 0000-0001-9040-5762

activities. ABC is also a strategic asset for decision-making, with a particular level of predetermined accuracy and effectiveness (Making, 2020). This article empirically explores the symbiotic relationship between Activity-Based Costing and decision-making within Thai startups, highlighting the mediating effect of perceived accuracy.

ABC is a cost accounting practice related to the strategic dimension of the company. It is promoted as a method for reducing inaccuracies in the traditional costing system measurements that arise from product diversity and intensive global competition (Fitriasari and Kawahara, 2020). Proponents argue that ABC is a more refined cost system type that provides greater detail, better classifies costs according to behavior, reports cost information more frequently, can provide more accurate cost data, and results in the ability to calculate more variances (Maiga et al., 2014; Schmidt et al., 2023). Significantly, ABC generates "better" (i.e., more relevant and useful) information that enhances managerial decision-making and enables improved performance (e.g., Daowadueng et al., 2023; Schoute, 2011). This is reflected in the attention to designing a suitably sophisticated product cost system (Al-Omiri and Drury, 2007; Fatah, 2024). ABC has the potential to influence the strategic direction and performance of the organization.

Thailand's startup business environment is vibrant and experiences high-end technology and innovative business models. The recently established startup companies are inherently related to technology and innovation. They must take advantage of unexpected opportunities, exceptions, new relationships, uncertain outputs, risks, and possible failure (Khong-khai and Wu, 2018; Potjanajaruwit and Girdwichai, 2019). Moreover, they face a highly dynamic and unstructured environment with high uncertainty, informal structures, and communication channels (Aldianto et al., 2021; Boll, 2018). However, amidst this possible burgeoning growth, startups face the challenge of resource allocation and effective cost-management practices for decision-making, which are critical elements that often determine the success or failure of new businesses—considering that startups face a high possibility of failure, using ABC guides suitable strategic decision-making in pursuing competitive advantage, cost-efficiency, and improved performance.

Therefore, it is interesting to investigate the role of ABC in enhancing decision-making in Thai startups. According to Thailand Startups, the Thai government promotes the policy to drive the economy towards higher innovation levels by increasing the support level for creating new startups. As a result, there has been an increase in the number of startup companies in Thailand (National Innovation Agency, 2021). Considering this background, this research aims to investigate the relationship between activity-based costing and decision-making in Thailand startups, considering the mediation effect of perceived accuracy on the relationship. The research seeks to unpack the dynamics of this relationship, focusing on how the perceived accuracy of ABC information mediates its impact on strategic decisions.

The research addresses several research gaps; first, the study examines how ABC impacts the decision-making process of Thai startups, thus providing clues into how ABC is applied and its effectiveness in business environments that cater to local Thai businesses and any challenges they may face based on the Thai context. The study also investigates the relevance of perceived accuracy in shaping decisions made by Thai startups. This is considered an innovative area of exploration that explores the psychological and cognitive components of decision-making, providing data on how the perceived accuracy of information influences the choices and actions of startup founders and CEOs. The research also extends the study of cost system design by investigating the mediation effect of perceived accuracy on the relationship between activity-based costing and decision-making in startups. In addition, management accounting research in startups, particularly studies on costing system design in startups, needs to be improved; this research contributes to filling this gap. Lastly, since activity-based costing can provide more accurate cost information, it may help startup entrepreneurs make better strategic decisions. The need to add to the literature about the link between ABC, perceived accuracy, and decision-making was also identified by the researcher, as this illustrates a research gap in the published literature, signalling the need for more exploration and investigation on the topic through quantitative studies to provide startup entrepreneurs with better decision frameworks to ensure their viability and competitiveness, and also contribute to the empirical repository regarding startup decision making, and cost and operational management.

Literature Review and Hypothesis Development

The theoretical foundation of Activity-Based Costing (ABC) lies in its departure from traditional cost allocation methods. The traditional cost systems allocate costs to products with volume-based cost drivers, including direct materials, direct labor, and overheads. When products consume much more resources (e.g., volume, complexity, customization), it is argued that a volume-based cost-accounting system will lead to biased cost information (Dearman and Shield, 2001; Schmidt et al., 2023). Traditional cost systems allocate heterogeneous overhead costs to products using a single rate (e.g., a labor hour or set-up hour), which is unrelated to demands made by the products on organizational resources (Koster et al., 2023; Van Vlokhoven, 2019). On the contrary, ABC assigns costs to specific activities rather than departments or products, providing a more accurate reflection of resource consumption (Yang et al., 2023).

Kaplan and Cooper (1998) elucidated the principles of ABC, highlighting its potential to enhance decision-making by identifying cost drivers and tracing costs to activities that contribute directly to value creation. ABC is based on the principle that products, services, or customers consume resources differently based on the activities required to produce or deliver them. Therefore, as suggested by Hoozée and Hansen (2018), the critical aspect of ABC is identifying cost drivers' factors that influence the consumption of resources by activities. It is, therefore, useful for

internal decision-making for which accurate product information is required, for example, for strategic decision-making, product pricing, product profitability, and customer profitability analysis (Al-Omiri and Drury, 2007; Enes and Koşan, 2024; Drury, 2011; Jänkälä and Silvola, 2012; Saleh et al., 2023). As suggested by Quesado and Silva (2021), this costing technique captures the actual consumption of resources by activities, compared to relying on arbitrary allocation bases. This helps the firms to understand the true cost of their operations better and make more informed decisions about resource allocation and pricing.

Decision-making in startups and ABC

The concept of startup decision-making could be understood from Tarasvathy's (2001) Effectuation Theory. The decision-making process of startups is tricky because they operate in a highly uncertain and dynamic environment (Ajah, 2023; Rocha and Grilli, 2023; Tomy and Pardede, 2018). As a result, adaptation and flexibility is paramount. Sarasvathy's Effectuation Theory provides a distinct perspective on how entrepreneurs navigate decision-making under certain conditions. According to this theory, entrepreneurs' decision-making process starts by considering the resources they control and iteratively developing opportunities based on their available means (Mishra and Zachary, 2015; Sarasvathy, 2001). The theory aligns with the application of ABC in startup decision-making in effectively allocating resources and providing insights into the costs associated with various activities (Liu, 2020). The use of ABC by startups equips them with financial insights, which are important for quickly responding to changing market conditions or unforeseen challenges. By continuously monitoring costs and performance metrics, entrepreneurs can make informed decisions that capitalize on emerging opportunities or mitigate potential threats (Javaid et al., 2022; Tomy and Pardede, 2018). This proactive management approach enables startups and managers to stay agile in response to potential market dynamics and internal operational challenges with disruptive capabilities, thereby fostering adaptability and resilience in the face of uncertainties (Corvello et al., 2023; Perifanis and Kitsios, 2023; Schoemaker et al., 2018). Incorporating ABC as a decision-making strategy involves a shift towards a more detailed and accurate cost allocation method. ABC enables startups to assign costs to specific activities, providing a granular view of cost drivers and their impact on operational expenditure. The proposed methodology surpasses traditional costing techniques by providing a more accurate understanding of the resources utilized by individual organizational activities (Koster et al., 2023; Okorie et al., 2023; Quesado and Silva, 2021).

Empirical literature

ABC is one example of a response to the lack of usefulness of traditional cost systems (Al-Dhubaibi, 2021). The ABC system divided overhead costs into multiple cost pools and drivers and traced them to products based on their resource consumption (Making, 2020; Schmidt et al., 2023). Consequently, ABC provided managers with a more complex approach to evaluate the expenses associated with specific activities used to support a product (Abeyseker and Sharma, 2023; Banker

et al., 2008). Therefore, it contributes to the estimation of product profitability for purposes of product pricing, discontinuation operation, and make-versus-buy decisions (Drury, 2011) and reduces the cost of manufacturing products in the design stage by providing more accurate cost information concerning alternative design specifications (Ittner et al., 2002; Rahim, 2020). ABC also provides valuable insights into the profitability of products, customers, and markets, enabling organizations to focus on high-value activities and opportunities for growth. Small businesses with personalized decision-making and uncomplicated organizational frameworks can play a vital role in implementing ABC, particularly technology companies that encounter environmental instability and the possibility of failure (Pham et al., 2021; Raucci and Lepore, 2020; Tuccillo and Agliata, 2018). It is hypothesized that startups that leverage the concept of ABC would effectively gain a competitive advantage by optimizing costs, enhancing product and service quality, and responding more effectively to market demands (Tomy and Pardede, 2018). Based on prior studies, the researcher, therefore, hypothesizes that:

H1: A distinctive and positive correlation exists between activity-based costing and decision-making.

Activity-based costing and perceived accuracy

ABC is claimed to have superiority over traditional costing methods because it generates cost information more accurately (Banker et al., 2008; Pike et al., 2011; Quesado and Silva, 2021). The accuracy of the information in the ABC system is a result of the increase in multiple cost pools and cost drivers. The literature demonstrates that increasing the number of cost pools increases cost data accuracy because it reduces the likelihood of costs being averaged across cost pools (Mastilak, 2011; Pathak et al., 2019; Schmidt et al., 2023). According to Brierley (2008), to represent better the consumption of cost pool resources by-products, an increase in the number of cost drivers increases the accuracy. This is because it better measures the quantity of resources consumed by individual products by identifying the appropriate cost driver of each cost pool (Fisher and Krumwiede, 2012; Homburg, 2001). As a result, it provides a high level of cost data accuracy. The following hypothesis was therefore proposed:

H2: An activity-based costing system exhibits a statistically significant and positive correlation with perceived accuracy.

Perceived accuracy and decision-making

A manager's judgment on perceived information usefulness depends on the quantity of information. Earlier studies in psychology suggest that users preferred more information since it generated more confidence on the part of the users (Desender et al., 2018; Eberhard, 2023). This implied that users feel secure and better when they have more information for making decisions, such as those concerning investments. Zhang et al. (2020) further suggest that more detailed information influences judgment accuracy. Judgment accuracy is the degree of correspondence between a behaviour response and a criterion (Dearman and Shields, 2001; Zurbriggen et al., 2023). Research by Wu and Xu (2018) found a relationship between accuracy and

the quantity of information supplied (e.g., the level of aggregation, perceived load, and number of cues). It revealed that accuracy is a positive function of a large quantity of supplied information. In terms of a costing system, when products have diversity in their consumption of manufacturing resources (e.g., volume), a volume-based cost system provides distortions in proportion to production volumes, and this leads to biased product cost information (Drury, 2011; Maiga et al., 2014; Schmidt et al., 2023). Cidav et al. (2020) infer that ABC provides more details relating to cost information and is considered to improve upon these limitations. Empirical evidence reveals that a greater detail of cost information can generate more relevant and more accurate information that enhances the quality of managerial decision-making (Gürkut et al., 2023; Maiga et al., 2014; Pike et al., 2011). Thus, the accuracy of product cost information influences the cost-based judgments of managers. More accurate product cost information generally leads to better judgment and decision-making (Dearman and Shields, 2001; Hilbig et al., 2015; Saleh et al., 2023; Schmidt et al., 2023). Based on these literature arguments, the following hypothesis was proposed:

H3: There is a positive and significant association between perceived accuracy and decision-making.

Theoretical concept

The following conceptual framework was developed from the hypothesis above, expressing the relationship between the study variables.
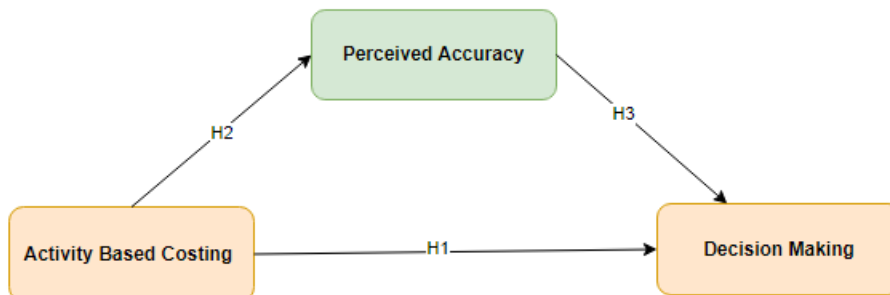

Figure 1: Theoretical model of the study

Research Methodology

This study adopted a quantitative survey research design to investigate the mediation effect of perceived accuracy on the relationship between Activity-Based Costing (ABC) and decision-making in Thailand's startups. This has been validated by several studies (Abeyseker and Sharma, 2023; Daowadueng et al., 2023; Saleh et al., 2023). The study utilized an inferential research design, which involved a survey to collect primary data from the respondents - decision-makers within Thailand's startup sector. The survey used a structured questionnaire designed to measure respondents' perceptions quantitatively. The population of this study was drawn from startup founders, CEOs, and employees (accountants) of startup companies in Thailand. According to the database of startup companies on the website Ecosystem

Startup Thailand (2023), there are about 481 startups in Thailand; the purpose was to select at least one respondent from each startup identified. The startups were grouped into Business and ServiceTech, IndustryTech, TravelTech, GovTech and EdTech, FinTech, HealthTech, Lifestyle and EntertainmentTech, PropertyTech, UrbanTech, and AgriTech.

The study sample was selected by applying the Taro Yamane formula:

$$n = \frac{N}{1 + Ne^2}$$

Where: n=Sample size; N=Number of population; e=the margin error (0.05)

$$\text{Replacing} \quad n = \frac{481}{1 + (481 * 0.05^2)} = 218.3$$

Therefore, the study required a sample size of 218 respondents.

Data collection

The data was collected using an online questionnaire hosted using Google Forms from September 1, 2023, to November 30, 2023. All the measurements applied in the study relied on prior research studies. The questionnaire was subdivided into five sections; responses to the first section comprise general information about the respondent, such as gender, age, educational background, and work experience. Responses in the second section provide general information about the company, such as the year of establishment, organizational industry, and the number of employees. The third part of the questionnaire requires the respondents to identify the company's strategy and environmental situation. The fourth section relates to activity-based costing. The last section of the questionnaire contains questions about evaluating decision-making using activity-based costing. The questionnaire was pre-tested before being randomly sent to the respondents. Reminder calls followed up on an initial survey. The link to the questionnaire was emailed to prospective startup managers and CEOs with explicit instructions for only one member of the organization to complete the questionnaire. Out of the 218 startups contacted, 190 duly filled responses are suitable for analysis, representing approximately 87% response rate, which is deemed acceptable based on the literature (Ali et al., 2021; Ericson et al., 2023). Late respondents are similar to non-respondents (Oppenheim, 2000) and were treated as non-respondents compared to in-time respondents. The data analysis tested whether differences existed between the in-time and late respondents using T-tests and Chi-square tests. The results revealed no significant differences in most variables (all $P > 0.05$). Thus, we concluded that a non-response bias did not affect our study.

Measurement variable

Activity-based Costing is the extension of activity-based costing in the firm (Enes and Koşan, 2024; Jänkälä and Silvola, 2012). It was measured by asking respondents to rate activity-based costing used by their firm. A 7-point Likert scale rates agreement from "1 = not applicable" to "7 = strongly applicable" was adopted. Decision-making is the degree of decision usefulness of the cost information (Chang et al., 2023; Saleh et al., 2023). The measurement for supporting decision-making was adapted from an instrument used in prior studies (Chenhall, 2004; Schoute, 2009). It was measured with multiple questions asking respondents to rate the cost information used to make decisions. A 7-point Likert scale rates agreement from "1 =strongly disagree" to "7 = strongly agree." It was measured with multiple questions asking respondents to rate the cost information used to make decisions. A 7-point Likert scale rates agreement from "1 = strongly disagree" to "7 = strongly agree" with the following statements; cost information is used in capacity management and capacity investment decisions, cost information is used to identify opportunities for improvement, cost information is used to drive process improvement efforts, cost information is used in process/operations management, cost information is used in product management decisions (e.g. the range of products, product pricing, cost reduction and modeling), cost information is used in restructuring or reorganization decisions (e.g. reengineering), cost information is used in product development strategies and decisions (e.g. new product development and design), cost information is used in outsourcing decisions, cost information is used for budgeting and planning, cost information is used for compensation and rewards, cost information is used for performance evaluation, and cost information is used for working capital management. Perceived accuracy is the cost system providing an accurate assessment of costs (Brierley, 2008; Schmidt et al., 2023). We used a multi-item scale intended to measure an individual's perceived information accuracy with their cost system. Respondents were asked to rate on a seven-point Likert scale that ranges from "1 = strongly disagree", "7 = strongly agree" (Pizzini, 2006; Pike et al., 2011) using the following statements: the information from activity-based costing seems like it could be more reasonable based on what I know about this division, the results from activity-based costing matched my intuition about production costs, information from activity-based costing provides an accurate assessment of costs in this division, the division managers are eager to get information from activity-based costing, information from activity-based costing is used in specific/special case costing studies, and despite the challenges in implementing an activity-based costing system, the manager still believes that the activity-based costing system is a good tool to help manage the business.

Method of analysis

The hypotheses were tested using the multiple regression analysis. The multiple regression analysis was conducted to analyze the effects of activity-based costing and perceived accuracy on decision-making. This means that decision-making was

the dependent variable, while the independent variables were activity-based costing and perceived accuracy.

The following regression model was adopted.

$$Y_0 = B_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

The model is then specified as follows:

$$DM = B_0 + \beta_1 ABC + \beta_2 PA + \varepsilon$$

Where, DM = decision making; ABC = activity-based costing; PA = perceived accuracy. The SPSS software was adopted.

After running the multiple regression analysis, the mediation effect of perceived accuracy on the effect of activity-based costing on decision-making was evaluated. To test the mediation effect, Baron and Kenny (1986) proposed a four-step approach that was adopted. In this method, several regression analyses are conducted, and the significance of the coefficients is examined at each step.
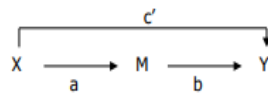
	Analysis	Visual Depiction
Step 1	Conduct a simple regression analysis with X predicting Y to test for path c alone, $Y = B_0 + B_1 X + e$	
Step 2	Conduct a simple regression analysis with X predicting M to test for path a, $M = B_0 + B_1 X + e$.	
Step 3	Conduct a simple regression analysis with M predicting Y to test the significance of path b alone, $Y = B_0 + B_1 M + e$.	
Step 4	Conduct a multiple regression analysis with X and M predicting Y, $Y = B_0 + B_1 X + B_2 M + e$	

Figure 2: Mediation analysis method adopted

Assuming significant relationships from Steps 1 through 3, one proceeds to Step 4. The model suggests no mediation if any relationships are insignificant (Step 1- step 3). In step 4, if the coefficient for M remains significant, there is partial mediation. If X in step 4 is no longer significant, then full mediation exists.

Research Results and Discussion

The first analysis was the descriptive statistics. The results are summarized in Table 1. The first analysis was the characteristics of the individual respondents. Considering the gender variable, most respondents were female (53.7%), while males were 46.3%. The positions held by the respondents were also evaluated, where the majority indicated they were accountants (88.9%), followed by those who were managers (6.3%). The department in which they were operating was also evaluated, where the majority indicated that they were in the production department (37.4%), followed by those in the marketing department (66%), and then those in the financial

and accounting departments (13.7%). The work experience was also evaluated based on whether the workers had worked in other companies. The results indicated that almost all (99.5%) had worked in different companies.

Table 1. Descriptive statistics for individual respondents

Variables	Categories	Frequency (n)	Percent (%)
Gender	Male	88	46.3
	Female	102	53.7
Position	Owner	9	4.7
	Accountant	169	88.9
	Manager	12	6.3
Department	Financial and Accounting	26	13.7
	Human Resources (HR)	10	5.3
	Marketing	66	34.7
	Research and Development (RandD)	6	3.2
	Production	71	37.4
	Other	11	5.8
	No	1	0.5
Work Experience	Yes	189	99.5
	Total	190	100

In addition, a descriptive analysis was conducted to evaluate the characteristics of the startup companies the respondents worked for. Considering the industry, the most common was HealthTech (20%), followed by Business and ServiceTech (14.7%), and then Lifestyle and EntertainmentTech, representing 12.1%. An analysis was conducted to determine whether they operated domestically or internationally; the majority indicated they operated domestically (64.7%), while the rest operated domestically and internationally (35.3%). Product diversity was also evaluated, where the majority were those with several products (88.4%), while a significant proportion had numerous (11.1%). For the study, several was defined as "less than 10," while numerous was defined as "greater than 10."

Table 2. Descriptive statistics for Startup companies

Variables	Categories	n	%
Industry	Business and ServiceTech	28	14.7
	IndustryTech	17	8.9
	TravelTech	22	11.6
	GovTech and EdTech	17	8.9
	FinTech	12	6.3
	HealthTech	38	20
	Lifestyle and EntertainmentTech	23	12.1

Variables	Categories	n	%
	PropertyTech	13	6.8
	AgriTech	20	10.5
International Sale	International	0	0
	Domestic	123	64.7
	Domestic and international	67	35.3
Product Diversity	1 = Only one	1	0.5
	2 = Several (2-5)	168	88.4
	3 = Numerous (more than 5)	21	11.1

The reflective measurement models show the relationship between the latent variables (unobservable indicators) and the manifest variables (observable indicators) (Rigdon, 2016). Our study has two latent variables, including in the reflective measurement models (decision-making and perceived accuracy). These reflective measurement models are assessed on convergent validity (factor-loadings and average variance extracted (AVE)), internal consistency reliability (composite reliability and Cronbach's Alpha), and discriminant validity (Hair et al., 2020).

Based on Table 3, first, convergent validity, we find that the factor-loadings of the latent variables exceed 0.50. It indicates that their indicators correlate positively with other indicators of the same construct. Further, with the Average Variance Extracted (AVE) of each variable, we find that they exceed 0.50, indicating that, on average, the construct explains more than half of the variance of its indicators (Hair et al., 2020).

Second, internal consistency reliability, Composite Reliability, and Cronbach's Alpha of the latent variables are between 0.70-0.90, indicating that all indicators have internal consistency and are reliable. Lastly, we measure discriminant validity using three techniques suggested by Hair et al. (2020):

1. Testing the HTMT, the results show that bias-corrected 95% confidence intervals of latent variables do not include 1.
2. Analyzing the Fornell-Larker criterion to compare the square root of the AVE value of each construct with any correlations between them and the other constructs (Fornell and Larker, 1981). This revealed that the square root of each construct's AVE is greater than its highest correlation with any other constructs (see Table 3 and the correlation matrix).
3. Cross-loading, the results show that an indicator's outer loading on the associated construct is greater than any of its cross-loadings on other constructs.

The research data supports the measures' discriminant validity, demonstrating that each construct is distinct from other constructs (Hair et al., 2020). In summary, the models' measurement of the variables adopted in this study were highly reliable and valid.

Table 3. Results summary for reflective measurement models

Latent Variable	Indicators	Convergent Validity		Internal Consistency Reliability			Discriminant Validity
		Loading	AVE	Cronbach's Alpha	Reliability Rho_A	Composite Reliability	HTMT
		>0.70	>0.50	0.70-0.90	0.70-0.90	0.70-0.90	<0.85 (0.9)?
Decision-Making	DM1	0.80	0.58	0.83	0.83	0.84	Yes
	DM2	0.74					
	DM3	0.72					
	DM4	0.79					
	DM5	0.74					
	DM6	0.76					
	DM7	0.79					
	DM8	0.75					
	DM9	0.74					
	DM10	0.70					
	DM11	0.77					
	DM12	0.80					
Perceived Accuracy	ACC1	0.74	0.57	0.85	0.85	0.89	Yes
	ACC2	0.71					
	ACC3	0.77					
	ACC4	0.80					
	ACC5	0.75					
	ACC6	0.73					

The correlation analysis was conducted to evaluate the relationship between the study variables in terms of direction and strength of the relationship. In the correlation matrix in Table 4, the data reports the significant correlations between the dependent variable in our model and the other variables. First, the result established a significant positive correlation between activity-based costing and perceived accuracy ($\beta = 0.628$, $P < 0.05$). Furthermore, activity-based costing and decision-making showed a significant positive correlation ($\beta = 0.427$, $P < 0.05$).

Table 4. Correlation matrix

Variables	ABC	ACC	DM	Tolerance	VIF
ABC	1			0.606	1.651
ACC	0.628**	1		0.656	1.523
DM	0.427**	0.586**	1	0.818	1.223

Note: 1. N = 190. 2. ** Correlation is significant at the 0.05 level (2-tailed)

The overall model, illustrated by ANOVA (see Table 5), was significant $F_{(2, 187)} = 84.222$, $p=0.000$. On examining the R-squared, it was 0.474, which implied that 47.4% of the variation in the dependent variable was explained by the independent variables included in the model. The results indicated that activity-based costing (ABC) significantly and positively influences decision-making ($\beta = 0.44$, $p=0.00$). Similarly, the results also indicated that perceived accuracy positively and significantly influences decision-making ($\beta = 0.38$, $p=0.00$).

Table 5. Regression analysis data

ANOVA	Sum of Squares	df	Mean Square	F	Sig.
Regression	15.452	2	7.726	84.222	.000b
Residual	17.154	187	0.092		
Total	32.606	189			

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.18	0.41		2.92	0.00
ABC	0.44	0.08	0.40	5.62	0.00
ACC	0.38	0.07	0.36	5.14	0.00

R = 0.688, R-squared = 0.474,

The other analysis was the mediating effect of the perceived accuracy on the effect of activity-based costing on decision-making (Table 6). The results indicated that steps 1, 2, and 3 were significant. Therefore, step 4 regression analysis was conducted. Since the effect of activity-based costing (ABC) and perceived accuracy (ACC) on decision-making (DM) was significant, then it was conclusive that perceived accuracy had partially mediated the effect of ABC on decision-making.

Table 6. Mediating effect of perceived accuracy

Model	Paths	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
Step 1	ABC -> DM	0.71	0.06	0.63	11.19	0.00
Step 2	ABC ->ACC	0.71	0.06	0.66	11.93	0.00
Step 3	ACC -> DM	0.65	0.06	0.62	10.85	0.00
	ABC -> DM	0.44	0.08	0.40	5.62	0.00
Step 4	ACC -> DM	0.38	0.07	0.36	5.14	0.00

The results obtained from the analysis are aligned with those of Jänkälä and Silvola (2012), Schmidt et al. (2023), and Boll (2018). Jänkälä and Silvola (2012) reveal that ABC is suitable for large manufacturing with more resource consumption and is beneficial for all kinds of firms and organizations. Small firms with individualized decision-making and simple organizational structures can be crucial for adopting ABC, especially technology firms that face environmental turbulence and the risk of failure (Pham et al., 2021; Raucci and Lepore, 2020). A comprehensive costing system like ABC may enhance organization processes and enable better strategic decision-making, leading firms to compete better with competitors. Using ABC as a costing framework enables reliable financial statements that investors may be concerned about before investing (Aldianto et al., 2021; Boll, 2018).

The findings contribute to research on management accounting in startup companies in two ways. Firstly, the study of management accounting, particularly cost accounting in startup companies, needs to be improved. The study shows a

relationship between ABC and decision-making through perceived information accuracy in startup companies, which is supported by the literature (Rocha and Grilli, 2023; Tomy and Pardede, 2018). Secondly, there has been an argument that ABC suits large manufacturing firms. The study provides information that ABC can adopt to small- and medium-sized firms plus technology-based firms like startups. From a practical point of view, since ABC can generate greater detail of cost information, which provides more accurate cost data and results in better decision-making (Pizzini, 2006; Quesado and Silva, 2023; Schmidt et al., 2023), startup owners or managers can benefit from this point to make profitable product pricing with cost-efficiency.

Furthermore, ABC may help startup owners or managers with operative decision-making and management. When creating a design for an ABC system, the startup owners or managers must carefully think about their business process and activity and identify which activities are value or non-value-added (Saleh et al., 2023; Tuccillo and Agliata, 2018). Lastly, since startup companies may be disadvantaged by poorly selling products, ABC may also assist the startup owners or managers in focusing on the most profitable products and customers to generate growth (Enes and Koşan, 2024; Jänkälä and Silvola, 2012).

Conclusion

This study aimed to investigate the influence of perceived accuracy on the relationship between ABC and decision-making in Thai startups. Data analysis was performed in SPSS software. The findings show that there is a significant relationship between ABC and decision-making. Contrarily, when perceived accuracy was added as a mediator in the relationship between ABC and decision-making, the results show a significant relationship between them. Therefore, perceived accuracy partially mediates the relationship between ABC and decision-making. This implies that ABC benefits startups because it provides accurate information that enhances strategic decision-making. The study has limitations that require further investigation. Even though ABC is widely known among practitioners, respondents' views of the concept may differ in the study universe. Researchers have yet to explore the relationship between ABC and firm performance, and further study may contribute to this point. Investigating whether more use of ABC is linked with using other management practices (such as target costing, budgeting, and balanced scorecards) may be interesting. Further studies could enhance the approach to finding the relationship between them. Also, the methodology utilized was the survey research design for data collection; however, for more in-depth investigations about the benefits of using ABC, the case study approach may provide a deeper understanding of the specific instance. Lastly, since the evidence is based on startup companies in Thailand, it might limit generalization. Further study may investigate other countries and compare the results with our findings.

Acknowledgements

References

Abeysekera, I., Sharma, R., (2023). Activity-based costing technology adoption in Australian universities. *Frontiers in Psychology*, *14*, 1168955.

Ajah, E. O., (2023). Investigating the factors fostering early-stage digital startup survival during gestation in Nigeria market. *Digital Business*, *3*(2), 100069.

Al-Dhubaibi, A., (2021). Optimizing the value of activity based costing system: The role of successful implementation. *Management Science Letters*, *11*(1), 179-186.

Aldianto, L., Anggadwita, G., Permatasari, A., Mirzanti, I. R. and Williamson, I. O., (2021). Toward a business resilience framework for startups. *Sustainability*, *13*(6), 3132.

Ali, F., Ciftci, O., Nanu, L., Cobanoglu, C. and Ryu, K., (2020). Response rates in hospitality research: an overview of current practice and suggestions for future research. *Cornell Hospitality Quarterly*, *133*, 104304.

Al-Omiri, M., Drury, C., (2007). A survey of factors influencing the choice of product costing systems in UK organizations. *Management Accounting Research*, 18(4), 399-424.

Banker, R. D., Bardhan, I. R. and Chen, T. Y., (2008). The role of manufacturing practices in mediating the impact of activity-based costing on plant performance. *Accounting, Organisations and Society*, *33*(1), 1-19.

Baron, R.M., Kenny, D. A., (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal Of Personality and Social Psychology*, *51*(6), 1173.

Boll, N., (2018). Is the use of management accounting in startups a paradox? -A systematic literature review of how static management accounting practices can support dynamic startups. *Junior Management Science*, *3*(4), 48–64.

Brierley, J. A., (2008). Toward an understanding of the sophistication of product costing systems. *Journal of Management Accounting Research*, *20*, 61-78.

Chang, K., Lasyoud, A. A. and Osman, D., (2022). Management accounting system: Insights from the decision making theories. *Social Sciences and Humanities Open*, *8*(1), 100529.

Chenhall, R. H., (2004). The role of cognitive and affective conflict in early implementation of activity-based cost management. *Behavioral Research in Accounting*, *16*(1), 19-44.

Cidav, Z., Mandell, D., Pyne, J., Beidas, R., Curran, G. and Marcus, S., (2020). A pragmatic method for costing implementation strategies using time-driven activity-based costing. *Implementation Science*, *15*(1), 1-15.

Corvello, V., Cimino, A. and Felicetti, A. M., (2023). Building startup acceleration capability: A dynamic capability framework for collaboration with startups. *Journal of Open Innovation: Technology, Market, and Complexity*, *9*(3), 100104.

Daowadueng, P., Hoozée, S., Jorissen, A. and Maussen, S., (2023). Do costing system design choices mediate the link between strategic orientation and cost information usage for decision making and control? *Management Accounting Research*, *61*, 100854.

Dearman, D. T., Shields, M. D. (2001). Cost knowledge and cost-based judgment performance. *Journal of Management Accounting Research*, *13*(1), 1-18.

Desender, K., Boldt, A. and Yeung, N., (2018). Subjective confidence predicts information seeking in decision making. *Psychological science*, *29*(5), 761-778.

Drury, C., (2011). *Cost and management accounting (7thed.).* London: South-Western Cengage Learning.

Eberhard, K., (2023). The effects of visualization on judgment and decision-making: a systematic literature review. *Management Review Quarterly*, *73*, 167–214.

Ecosystem Startup Thailand (2023). Startup Thailand ecosystem. https://ecosystem.startupthailand.org/

Enes, K., Koşan, L., (2024). Using time-driven activity-based costing in restaurant business: Levelled application of a case study. *Heliyon*, *10*(4), e25157.

Ericson, A., Bonuck, K., Green, L. A., Conry, C., Martin, J. C. and Carney, P. A., (2023). Optimizing survey response rates in graduate medical education research studies. *Family Medicine*, *55*(5), 304-310.

Fatah, R. D., (2024). The analysis of time-driven activity-based costing application as a dynamic value assessment and more accurate costing system in healthcare sector. *Journal of Global Economics and Business*, *5*(16), 1–15.

Fisher, J. G., Krumwiede, K., (2012). Product costing systems: Finding the right approach. *Journal of Corporate Accounting and Finance*, *23*(3), 43-51.

Fitriasari, D., Kawahara, N., (2020). The time-driven activity-based costing model for a small startup in Indonesia. *Binus Business Review*, *11*(2), 141-148.

Gürkut, C., Elçi, A. and Nat, M., (2023). An enriched decision-making satisfaction model for student information management systems. *International Journal of Information Management Data Insights*, *3*(2), 100195.

Hair Jr, J. F., Hult, G. T. M., Ringle, C., and Sarstedt, M., (2020). *A primer on partial least squares structural equation modeling (PLS-SEM)*, 3rd ed. Sage Publications

Hilbig, B. E., Michalkiewicz, M., Castela, M., Pohl, R. F. and Erdfelder, E., (2015). Whatever the cost? Information integration in memory-based inferences depends on cognitive effort. *Memory and Cognition*, *43*, 659–671.

Homburg, C., (2001). A note on optimal cost driver selection in ABC. *Management Accounting Research*, *12*(2), 197-205.

Hoozée, S., Hansen, S. C., (2018). A comparison of activity-based costing and time-driven activity-based costing. *Journal of Management Accounting Research*, *30*(1), 143-167.

Ittner, C. D., Lanen, W. N. and Larcker, D.F., (2002). The association between activity-based costing and manufacturing performance. *Journal of Accounting Research, 40*(3), 711-726.

Jänkälä, S., Silvola, H., (2012). Lagging effects of the use of activity based costing on the financial performance of small firms. *Journal of Small Business Management*, *50*(3), 498-523.

Javaid, M., Haleem, A., Singh, R. P., Suman, R. and Gonzalez, E. S., (2021). Understanding the adoption of Industry 4.0 technologies in improving environmental sustainability. *Sustainable Operations and Computers*, *3*, 203-217.

Kaplan, R. S., Cooper, R., (1998). *Cost and effect: using integrated cost systems to drive profitability and performance*. Harvard Business Press.

Khong-khai, S., Wu, H. Y., (2018). Analysis of critical success factors of startups in Thailand. *Executive Editor*, *9*(11), 66.

Koster, F., Kok, M. R., Waverijn, G., M. Weel-Koenders, E. A. and Barreto, D. L., (2023). Dealing with time estimates in hospital cost accounting: Integrating fuzzy logic into time-driven activity-based costing. *PharmacoEconomics Open*, *7*(4), 593-603.

Liu, S., (2020). Critical business decision making for technology startups: a perception case study. *IEEE Engineering Management Review*, *48*(4), 32-36.

Maiga, A. S., Nilsson, A. and Jacobs, F.A., (2014). Assessing the interaction effect of cost control systems and information technology integration on manufacturing plant financial performance. *The British Accounting Review*, *46*(1), 77-90.

Making, I. R I. D., (2020). Activity based costing system and its role in decision making. A case study of cement companies in Kurdistan region of Iraq. *International Journal of Psychosocial Rehabilitation*, *24*(06), 5915-5929.

Mastilak, M. C., (2011). Cost pool classification and judgment performance. *The Accounting Review*, *86*(5), 1709-1729.

Mishra, C., Zachary, R., (2015). The Theory of Entrepreneurship. *Entrepreneurship Research Journal*, *5*(4), 251-268.

National Innovation Agency, *(*2021*) Thailand Startup Ecosystem Report 2021.* Bangkok*:* The Stationery Office.

Okorie, O., Russell, J., Cherrington, R., Fisher, O. and Charnley, F., (2023). Digital transformation and the circular economy: Creating a competitive advantage from the transition towards net zero manufacturing. *Resources Conservation and Recycling*, *189*, 106756.

Oppenheim, A. N., (2000). *Questionnaire design, interviewing and attitude measurement*. Bloomsbury Publishing.

Pathak, S., Snyder, D., Kroshus, T., Keswani, A., Jayakumar, P., Esposito, K., Koenig, K., Jevsevar, D., Bozic, K. and Moucha, C., (2019). What are the uses and limitations of time-driven activity-based costing in total joint replacement? *Clinical Orthopaedics and Related Research*, *477*(9), 2071-2081.

Perifanis, N., Kitsios, F., (2023). Investigating the influence of artificial intelligence on business value in the digital era of strategy: A literature review. *Information*, *14*(2), 85.

Pfützenreuter, M., (2023). The implementation of financial planning and cost accounting instruments in startups. *Junior Management Science, 8*(2), 270-311.

Pham, D. C., Nguyen, L. S., Doan, T. N., Ta, T. T., Pham, H. L., (2021). The Influence of Activity-Based Costing Implementation on Firm Performance: An empirical evidence from Vietnam. *Montenegrin Journal of Economics*, *17*(4), 167-179.

Pike, R. H., Tales, M. E. and Mansor, N. N. A., (2011). Activity-based costing user satisfaction and type of system: A research note. *The British Accounting Review*, *43*(1), 65-72.

Pizzini, M. J., (2006). The relation between cost-system design, managers' evaluations of the relevance and usefulness of cost data, and financial performance: an empirical study of US hospitals. *Accounting, Organizations and Society*, *31*(2), 179-210.

Potjanajaruwit, P., Girdwichai, L., (2019). Creative innovation of startup businesses in Thailand 4.0 era. *Journal of International Studies*, *12*(3), 222-231.

Quesado, P., Silva, R., (2021). Activity-based costing (ABC) and its implication for open innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *7*(1), 41.

Rahim, S., (2020). Integration Of Cost Volume Profit And Activity Based Costing In Obtaining Cost Accuracy For Decision Making. *RAK (Riset Akuntansi Keuangan)*, *5*(2), 109-118.

Raucci, D., Lepore, D., (2020). A simplified activity-based costing approach for SMEs: The case study of an Italian small road company. *European Research Studies Journal*, *23*(1), 198-214.

Rigdon, E. E., (2016). Choosing PLS path modeling as analytical method in European management research: A realist perspective. *European Management Journal*, *34*(6), 598-605.

Rocha, V., Grilli, L., (2023). Early-stage startup hiring: the interplay between start-ups' initial resources and innovation orientation. *Small Business Economics*, 1-28.

Saleh, Q. Y., AL-Nimer, M. B. and Abbadi, S. S., (2023). The quality of cost accounting systems in manufacturing firms: A literature review. *Cogent Business and Management*, *10*(1), 2209980.

Sarasvathy, S. D., (2001). Causation and effectuation: Toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*, *26*(2), 243-263.

Schmidt, M., Mertens, K. G. and Meyer, M., (2023). Cost hierarchies and the pattern of product cost cross-subsidization: Extending a computational model of costing system design. *Plos one*, *18*(9).

Schoemaker, P. J., Heaton, S. and Teece, D., (2018). Innovation, dynamic capabilities, and leadership. *California Management Review*, *61*(1), 15-42.

Schoute, M., (2009). The relationship between cost system complexity, purposes of use, and cost system effectiveness. *The British Accounting Review*, *41*(4), 208-226.

Schoute, M., (2011). The relationship between product diversity, usage of advanced manufacturing technologies and activity-based costing adoption. *The British Accounting Review*, *43*(2), 120-134.

Tomy, S., Pardede, E., (2018). From uncertainties to successful start ups: A data analytic approach to predict success in technological entrepreneurship. *Sustainability*, *10*(3), 602.

Tuccillo, D., Agliata, F., (2018). The ABC as Tool for Decision Making in Public Administrations. *Open Journal of Accounting*, *7*, 125-138.

Van Vlokhoven, H., (2019). Estimating the Cost of Capital and the Profit Share. *The Economic Journal*, ueae001.

Wu, Z., Xu, J., (2018). A consensus model for large-scale group decision making with hesitant fuzzy information and changeable clusters. *Information Fusion*, *41*, 217-231.

Yang, Y., Jiang, J., Wang, R., Xu, G. and Gu, J., (2023). Study on the application of activity-based costing in cold chain logistics enterprises under low carbon environment. *Sustainability*, *15*(18), 13808.

Zhang, Y., Liao, Q. V. and Bellamy, R. K., (2020, January). Effect of confidence and explanation on accuracy and trust calibration in AI-assisted decision making. In *Proceedings of the 2020 conference on fairness, accountability, and transparency* (295-305).

Zurbriggen, C. L., Nusser, L., Krischler, M., and Schmitt, M., (2023). Teachers' judgment accuracy of students' subjective well-being in school: In search of explanatory factors. *Teaching and Teacher Education*, *133*, 104304.

MAKSYMALIZACJA PROCESU DECYZYJNEGO W STARTUPACH: OCENA WPŁYWU POSTRZEGANEJ DOKŁADNOŚCI W RACHUNKU KOSZTÓW DZIAŁAŃ

Streszczenie: Badanie ma na celu określenie roli rachunku kosztów działań (Activity-Based Costing- ABC) w usprawnianiu procesów decyzyjnych start-upów tajlandzkich, uwzględniając rolę postrzeganej dokładności. Badanie wskazuje kilka luk badawczych, w tym wpływ ABC na podejmowanie decyzji w kontekście tajlandzkich startupów oraz znaczenie postrzeganej dokładności w kształtowaniu procesów decyzyjnych, oba obszary wymagają dalszych badań literaturowych w celu pomocy startupom w podejmowaniu lepszych decyzji i zapewnieniu ich trwałości. W badaniu wykorzystano metodę badań ilościowych, zbierając pierwotne dane od populacji badawczej składającej się z założycieli/dyrektorów generalnych start-upów i księgowych w Tajlandii za pomocą ustrukturyzowanego kwestionariusza ankiety. Próba licząca 190 respondentów została wybrana spośród populacji badawczej, a odpowiedzi zostały przeanalizowane przy użyciu analizy korelacji i analizy regresji wielokrotnej. Wyniki wykazały, że ABC znacząco wpływa na podejmowanie decyzji w tajlandzkich start-upach. Wyniki wskazują, że właściciele lub menedżerowie tajlandzkich startupów są skłonni stosować ABC jako strategię ustalania kosztów, jeśli postrzegają ją jako dostarczającą dokładnych informacji podczas podejmowania decyzji, wskazując na jej potencjał w zakresie poprawy efektywności kosztowej, konkurencyjności, wydajności i przetrwania firmy w ekosystemie startupów. ABC to korzystna technika kalkulacji kosztów, pozwalająca start-upom wykorzystać efektywność kosztową, konkurencyjność, wysoką wydajność i przetrwanie firmy. Zrozumienie tego jest niezbędne dla start-upów, aby poruszać się po burzliwym środowisku biznesowym obarczonym niepewnościami.

Słowa kluczowe: rachunek kosztów działań, podejmowanie decyzji, startupy, zarządzanie finansami, decyzje strategiczne, zarządzanie operacyjne