

EFFECT OF COMPETITIVE PRESSURE, PERCEIVED LEVEL OF PROFESSIONAL, CLIENT'S ACCOUNTING ON PERFORMANCE IN PHARMACEUTICAL INDUSTRY OF THAILAND: MEDIATION WITH COMPUTER ASSISTED AUDIT

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Abstract

Computer-assisted audit techniques and tools or CAATTs enable businesses to highly improve their performances through the use of electronic audit papers, applications of the database, and the software called business intelligence audit. However, the main goal of the given study is to investigate the impact of CAATTs adoption by pharmaceutical firms on the performance of the sector through the role of competitive pressure and perceived level of professional body support. The role of clients' accounting information system complexity has also been evaluated in the given study to identify and measure the performance of the pharmaceutical sector. The framework of the given study was developed according to the technology firm environment framework. The data of the study was collected mainly from 448 employees from different pharmaceutical organizations in Thailand. The final results of the study revealed that the impact of the perceived level of professional body support was significant on CAATTs which directly influence the performance of the pharmaceutical sector. The results of the present study also suggest that the impact of clients' accounting information system complexity plays a significant role in enhancing the performance of the sector mainly the adoption of CAATTs. The results of the given research paper will positively contribute to the pharmaceutical sector of Thailand.

Keywords: CAATTs, competitive pressure, perceived level of professional body support, clients accounting information system complexity, performance

Conflict of Interest: The authors declare that there is no conflict of interest.

1. INTRODUCTION

In the current era, it becomes quite necessary for any organization to adopt the latest tool of audit and techniques in its operating activity (Somsuk & Laosirihongthong, 2017). There are five major computer assisted audit techniques that are mostly used by the large scale organizations in order to make a perfect audit and performance analysis, and make such strategies that boost the profit margin of the company in the market (Trisakhon & Jermittiparsert, 2019; Yousefi, Mehralian, Rasekh, & Yousefi, 2017). The major types and techniques of the CAATs are customized queries or script, software tracing, generalized audit software, utility software, audit expert system and other mapping software (Promsivapallop, Jones, & Roper, 2015). In the last year, a research was conducted by the business scholars in order to explore how the technology majorly impact the productivity and the performance

level of the healthcare and its related devices (Ing-udomnoogoon, 2019). Its related results are given below;

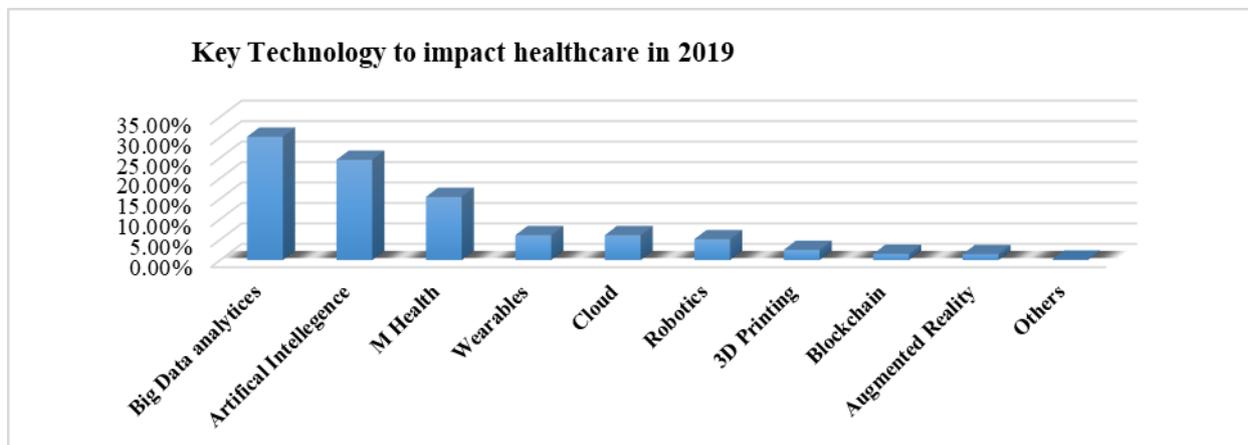


Figure 1: Key Technology to impact healthcare in 2019

According to the above-mentioned figure, a big data analytics-based audit software is widely used by the large scale healthcare centers and other pharmaceuticals companies in the year 2019. After this, artificial intelligence and mobile health are used in order to enhance the performance level of the medicine in the targeted customer market (Kanyakam, Pimpa, & Kamlai, 2018). In addition to this, Yousefi, Mehralian, Rasekh, & Yousefi conducted a research in 2017 where they explored how the highly profitable pharmaceuticals companies in Thailand majorly used the advanced technology in their operating, financing and investing activities (Yousefi et al., 2017). According to the following table, Pfizer is that company which majorly worked on the advanced technology adoption process, that's why its market share is much higher as compared to the other rivals in the Thailand market.

Table 1: Technology Adopted Top Ten Pharma Companies in Thailand.

Rank	Company	Revenue (USD million)	Market share (%)	Growth since 2017
1	Pfizer	288	5.2	5
2	GSK	261	4.8	1
3	MSD	246	4.5	2
4	Novartis	222	4.1	1
5	Roche	201	3.7	-4
6	Siam Bioscience	169	3.1	12
7	Sanofi Aventis	164	3.0	-5
8	Berline	149	2.7	16
9	Takeda	140	2.8	15
10	Sandoz	125	2.3	6

The above table explores the real picture of the current operating activities of the well-known pharmaceutical companies in the Thailand market and their development due to the perfect adoption of the technology and the computer assisted audit tools in their operating activities (Trisakhon & Jermstittiparsert, 2019). In Thailand, now most of its health drugs producers are utilizing a CAATs in order to make a proper research in the irregularities factor in the given data (Chienwattanasook & Jermstittiparsert, 2019; Ing-udomnoogoon, 2019). This adoption helps their internal accounting department to provide efficient analytical results (Kanyakam et al., 2018).

2. LITERATURE REVIEW

Competitive Pressure and Performance

In the current business world, there is a tough competition level among the companies to gain a large amount of market share and earn a long term profit margin in the customer market (Nguyen, Hagendorff, & Eshraghi, 2018). In order to highlight the impact of the competitive pressure on the performance, a research was conducted by scholars, where they critically evaluate the influence of culture as a controlling variable that plays an important part to strengthen the organizational policies and strategies regarding the business development (Grossman & Michelitch, 2018; Iriberry & Rey-Biel, 2019). According to the researchers, there is a direct relationship between the external threatening pressures on the performance level of the company. They stated that whenever the rival company makes some broader change in its products and services and other marketing related factors, then the customer market will fluctuate with that offer (Chung & Kuo, 2018). They concluded that being an entrepreneur, there is a need to make some backup plan in order to sustain the company position in the competitor market (Cantele & Zardini, 2018). So, the following hypothesis is proposed from the above studies.

H1: There is a significance relationship between Competitive Pressure and Performance

Mediating role of Computer Assisted Audit Tools and Techniques Adoption between Competitive Pressure and Performance

In 2019, the scholars stated that the latest techniques of CAATs are mostly used in the advanced competitive market, which creates a major pressure on the company's management to adopt such technology in the operating activities of a company (Widuri, Handoko, & Prabowo, 2019). According to Iriberry & Rey-Biel, these accounting tools will help the manager to effectively evaluate the performance of the company and compare it with the rivals. Also, it helps them to make such strategies and investment-based decisions that will enhance the profit margin of a company (Iriberry & Rey-Biel, 2019). According to the researchers, this factor majorly enhanced the competitive pressure on the firm activities (Maas, Schuster, & Hartmann, 2018; Modugno & Di Carlo, 2019; Siew, Rosli, & Yeow, 2020). So, these studies have been proposed the following hypothesis;

H2: Computer Assisted Audit Tools and Techniques Adoption plays a significant mediating role between Competitive Pressure and Performance

Perceived Level of Professional Body Support and Performance

According to Shahzad, Martin and others, the professional body support and its perceived values play an important role to upgrade the performance level of the pharmaceutical and other related companies (Martin, Swanton, Bradley, & McGrath, 2018; Shahzad, Farrukh, Kanwal, & Sakib, 2018). The reason is that they made such strategies and vision which help the company to upgrade its performance level (Janvrin, Mascha, & Lamboy-Ruiz, 2019). In 2020, the researchers concluded that in the current era, there is a need to make a firm support from the professional bodies to retain the company position in the competitive market (Gauld & Horsburgh, 2020). Hence, a proposed hypothesis is given below;

H₃: There is a significance relationship between Perceived Level of Professional Body Support and Performance

Mediating role of Computer Assisted Audit Tools and Techniques Adoption between Perceived Level of Professional Body Support and Performance

According to the scholars, an employee perception regarding the organizational values plays an important role to upgrade their reputation in customer market and in this case, an advanced CAAT adoption make a true and fair based transactions in order to enhance the confidence level of the employees (Martin et al., 2018; Siew et al., 2020; Wiengarten, Humphreys, Onofrei, & Fynes, 2017). They concluded that such technology adoption not only enhanced the performance, but also secure the future of the company in a highly diverse market (Mansour, 2016). Hence, these studies have been proposed the following hypothesis;

H₄: Computer Assisted Audit Tools and Techniques Adoption plays a significant mediating role between the Perceived Level of Professional Body Support and Performance

Client's Accounting Information System Complexity and Performance

Another important research is conducted in order to explore the impact of the complexity in the client accounting information system on the productive performance of a company. In the current era, it has now become a major need in front of any SMEs or large scale companies to work on the accuracy and reliability of the customer data (Hoffman, Sellers, & Skomra, 2018; Janvrin, Mascha, & Lamboy-Ruiz, 2019; Wang & Kogan, 2017). This is an important approach to make an independent assessment of the computerized data in order to check the reliability of the client software (Janvrin et al., 2019). Through this new technology adoption, the performance of the pharmaceutical company becomes enhanced by mitigating all the related risk factors (Hoffman et al., 2018). So, the following hypothesis is proposed from these researches;

H₅: There is a significant relationship between Client's Accounting Information System Complexity and Performance

Mediating role of Computer Assisted Audit Tools and Techniques Adoption between Client’s Accounting Information System Complexity and Performance

In 2019, Handoko, Sabrina, & Ayuanda stated that it becomes an essential tool in front of the product and service-oriented companies to follow the CAATs based techniques and procedure in their operating activities. According to the researchers, it will secure the future of the company in the long run and also give the surety to the customers that all of their data is secured in the company's confidential data (Handoko, Sabrina, & Ayuanda, 2019). The majority of the scholars stated that such advance audit based technology adoption will help the management to resolve the complexity factor within the accounting-based information of the customers and secure the company's bright future in the competitive market (Al-Hiyari, Al Said, & Hattab, 2019; Mansour, 2016). Hence, such studies have been suggested the following hypothesis;

H₆: Computer Assisted Audit Tools and Techniques Adoption plays a significant mediating role between Client’s Accounting Information System Complexity and Performance

Conceptual framework

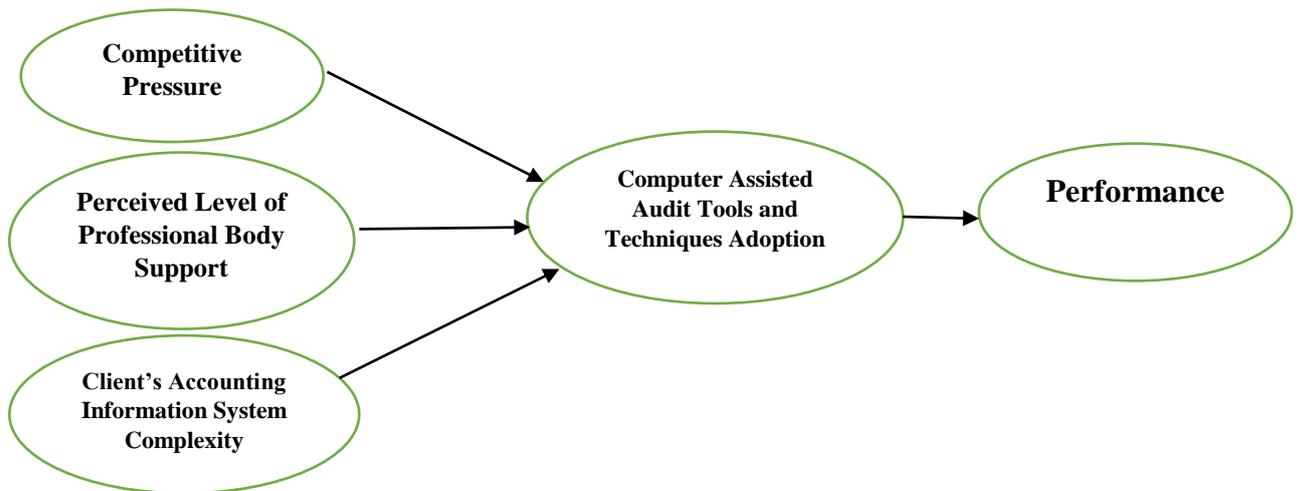


Figure 2: Conceptual Framework

3. METHODOLOGY

To discover the impact of computer assisted audit tools and adoption techniques on performance, this survey was piloted in Thailand pharmaceutical sector. This sector was elected because of rapidly growing market, it has 2nd position in world pharmaceutical market. Target population for this study was those pharmaceutical firms that use computerized audits tools. Participants of this survey are employees of Thailand’s pharmacies in different areas. Based on purposive sampling 448 workers from 15 pharmaceutical firms

were incorporated in sample. Questionnaires were mailed to these firms that were followed up by reminders calls and emails. Thailand pharmaceutical association was the source for contact details of these firms. 550 questionnaires were sent to the targeted firms. Out of which 102 incomplete questionnaires were rejected and rest were retained for analysis. Final sample of 448 respondents was consisted of Audit managers, audit directors, accountants, finance managers and other managing partners, these respondents were mainly focused because they are familiar with purposed variables. According to demographics of sample, 252 were male (56.3%), and 196 were female (43.7%). Most respondents were 25–30 years old (45.1%), and 140 respondents (43.3%) had post-graduation qualification. Most of the respondents had approximately 5 years of work experience (44.8%).

3.1 Instruments and measures for variables

Items and scale for questionnaires were mostly drawn from previous research work that were validated and confirmed. Five-point Likert scale was adopted to measure instruments items.

Competitive Pressure on firm is measured by three items adapted from Bradford and Florin (2003) scale. Three items including “Our firm experienced competitive pressure to implement CAATs”. Responses were noted on 5 Point-Likert scale ranging from 1=very weak to 5= very strong. Statistical finding showed $\alpha = 0.834$ composite reliability for competitive pressure on the operational performance of firm. For measuring the Perceived Level of Professional Body Support within the firm, four items were selected to evaluate firm’s support such as “Professional accounting bodies support CAATs usage”. Responses were recorded on a Five-point scale ranging from 1=strongly disagree to 5= strongly agree with $\alpha = 0.935$ as CR. AIS Complexity scale (Ahmi & Kent, 2013) by was used to measure Clients' Accounting Information System Complexity by modifying 4 items from this scale including “Most of our clients have highly-computerized financial reporting systems”. Response for these items is rated on a 5-point response scale from 1 (highly opposite) to 5 (highly similar). Results indicate satisfactory reliability, with a Cronbach’s alpha = 0.945.

The measurement for Computer assisted audit tools and adoption techniques was taken from the preceding work of Ramen (2015). Five items were applied in the questionnaire to measure the level of CAATs adoption in these pharmaceutical firms. One of the sample item is “Our firm has a great deal of opportunity to implement various CAATs” respondents recoded their responses on 5 Point Likert scale with a Cronbach’s alpha = 0.959.

3.2 Data Analysis

Statistical analysis for data was conducted on AMOS and SPSS to examine the hypothesized relationship between variables Confirmatory factor analysis and descriptive statistics test were performed using AMOS to test the reliability and validity of measurements. Cronbach’s α and composite reliability (CR) were operated to check the reliability of the measurements that indicated good reliability.

4. FINDINGS

4.1 Demographics

The demographical dimensions of age gender and experience are observed. The total sample consists of 448 respondents out of which 56.3 percent are male and 43.8 percent are female. The gender disparity depicts the patriarchy existing in the managerial positions in Thailand's pharmaceutical organizations. 75.2 percent of the sample has ages distributed between 20 and 35 and the experience levels of more than half of the sample is between 2 and years. The age and experience dimensions are representative of the variability in employee levels from which the data was collected.

4.2 Descriptive Analysis

The descriptive analysis is presented in table 1. The data is negatively skewed between -1 and 0 and demonstrates the normality of the data. However, outliers were found in the data, as the maximum and minimum statistic values are not in the range of five point Likert scale, 1 to 5.

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
ComPre	448	1.00	5.00	3.3677	1.02935	-.353	.215
PeLeBS	448	1.00	5.00	3.5394	1.17214	-.557	.135
CliAccSC	448	1.00	5.00	3.4809	1.18356	-.524	.511
CoATTA	448	1.00	5.00	3.1585	1.08055	-.138	.252
FinPerf	448	1.00	5.00	3.4035	1.16171	-.499	.145
Valid (listwise)	N 448						

4.3 KMO

KMO and Bartlett's test is used to validate the adequacy of the sample. The Bartlett's sphericity and KMO measures are used to determine the adequacy of the sample, the sample is adequate therefore the factors can be used for factor analysis.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.909	
Bartlett's Test of Sphericity	Approx. Chi-Square	8715.791
	df	190
	Sig.	.000

4.4 Factor Analysis

Factor analysis results are evident in the rotated component matrix in table 3. The factor loadings of all the items are greater than 0.7 (Hassan, Hameed, Basheer, & Ali, 2020; Iqbal & Hameed, 2020), which shows significance and contribution of each scale item in the variance of overall construct. The problem of cross-loading is also not present; therefore the factors are contributing in the variance of the constructs.

Table 4: Rotated Component Matrix^a

	Component				
	1	2	3	4	5
CP1					.753
CP2					.821
CP3					.798
PL1		.842			
PL2		.866			
PL3		.808			
PL4		.876			
CA1			.834		
CA2			.846		
CA3			.825		
CA4			.776		
TA1	.856				
TA2	.875				
TA3	.808				
TA4	.783				
TA5	.799				
FP1				.807	
FP2				.825	
FP3				.856	
FP4				.803	

4.5 Convergent, Discriminant Validity and Correlation Analysis

The results of discriminant and convergent validity are depicted in table 4. The variables are more related with themselves in comparison to other variables and the MSV values are also less than AVE thus discriminant validity is found to be present. Whereas, CR and AVE values are used to determine convergent validity. CR and Ave have threshold limits of 0.7 and 0.5, the values of both indicators are greater than these limits thus convergent validity is present in table 5.

Table 5: Convergent and Discriminant Validity

	CR	AVE	MSV	CP	TA	FP	CA	PL
CP	0.834	0.627	0.336	0.792				
TA	0.959	0.825	0.288	0.456	0.908			
FP	0.929	0.766	0.336	0.580	0.466	0.875		
CA	0.945	0.811	0.288	0.439	0.537	0.506	0.900	
PL	0.933	0.778	0.257	0.507	0.346	0.422	0.419	0.882

Table 6: Test of the Pearson Correlations

	CP	TA	FP	CA	PL	VIF
CP	-	.744**	.699**	.755**	.787**	1.000
TA	.000	-	.787**	.789**	.795**	1.005
FP	.000	.000	-	.797**	.758**	1.041
CA	.000	.000	.000	-	.793**	1.009
PL	.000	.000	.000	.000	-	1.324

**** Correlation is significant at the .01**

Table 6 shows Pearson correlation of all variables is positive and statistically significant at the .01 level ($p < .01$). As a result, multicollinearity problems should not be of concern about potential problems relating to multicollinearity, variance inflation factors (VIFs) which are used to test multicollinearity problems for each part of regression analysis. Thus, the VIF value shows 1.000-1.324 which are well below the cut-off value of 10 (Hair et al., 2020). Consequently, there are no significant multicollinearity problems.

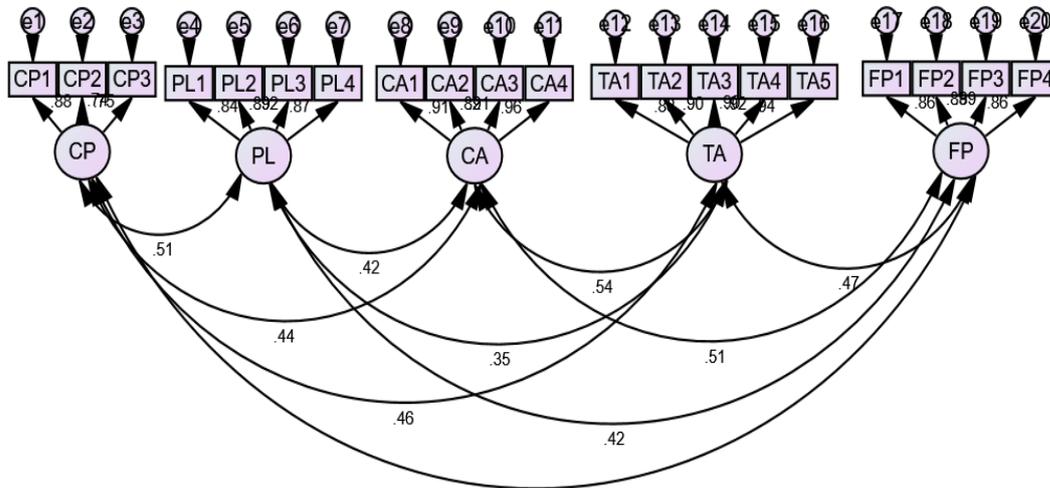
4.6 CFA

CFA test is conducted in order to determine the fitness of the model. The CMIN, CFI, GFI, RMSEA and IFI values were found to be in accordance with the threshold limits defined in the table. Thus, the model is deemed fit. The CFA test results are depicted in figure 3.

Table 7: Confirmatory Factors Analysis

Indicators	Threshold range	Current values
CMIN/DF	Less or equal 3	2.437
GFI	Equal or greater .80	.888
CFI	Equal or greater .90	.955
IFI	Equal or greater .90	.955
RMSEA	Less or equal .08	.074

Figure 3: CFA



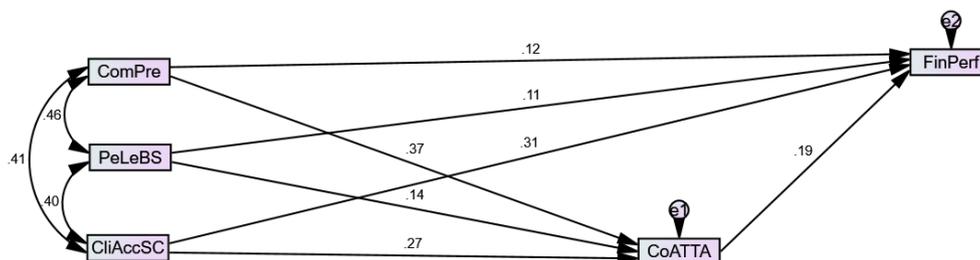
4.7 SEM

A unit change in CliAccSc produce an effect of 30.6 percent in financial performance. A unitary change in PeLeBs and ComPre produces an effect of 10.7 and 11.7 percent in the dependent variable FinPerf. The relationships and variances are significant therefore the hypotheses are accepted. The mediation of CoATTA produces significant effects. The mediation produces an effect of 5.2 percent through CliAccSc, 2.6 percent through PeLeBS and 7.2 percent through ComPe. The hypotheses are accepted as the relationships are significant.

Table 8: Structural Equation Modeling

Total Effect	CliAccSC	PeLeBS	ComPre	CoATTA
CoATTA	.274**	.137**	.375***	.000
FinPerf	.358***	.134**	.189**	.192**
Direct Effect	CliAccSC	PeLeBS	ComPre	CoATTA
CoATTA	.274**	.137**	.375***	.000
FinPerf	.306***	.107**	.117**	.192**
Indirect Effect	CliAccSC	PeLeBS	ComPre	CoATTA
CoATTA	.000	.000	.000	.000
FinPerf	.052**	.026*	.072**	.000

Figure 4: SEM



5. DISCUSSION

During the last few years, it can be seen that the value of computer-assisted audit tools and methods in the manufacturing sector has been increased. The results of the given study have significantly illustrated that the role of competitive pressure, information complexity, professional body support has a direct and positive impact on the performance of the companies in Thailand. A recent study by Albors-Garrigos, Igartua, and Peiro (2018) regarding this has also manifest and explained that such technological tools and techniques are used for the audit of a company as well as enhancing the performance. However, the client's accounting information system complexity with a relationship of performance is decreased through the mediating role of audit tools and technique adoption. It means that the CAATTs adoption somehow impacts the performance of the companies in a positive way, while somehow it provides the facilities for ease (MULEZA, 2019).

6. CONCLUSION

The main aim of this research study is to identify whether competitive pressure or perceived level of professional body support can play a part in manifesting the process of computer-assisted audit tools and techniques adoption CAATTs in enhancing the performance of Thailand pharmaceutical sector. The mediating role of computer-assisted audit tools and techniques were also evaluated in the given study to improve performance. For this intention, most of the information of the study has been gathered from about 448 employees of 15 top pharmaceutical organizations of Thailand through the use of questionnaire technique. For the calculation and analysis of data, the given study used descriptive statistics, Bartlett's test, SEM, KMO techniques.

7. IMPLICATIONS AND LIMITATIONS

The verdicts of the following research study will provide effective data and information to the pharmaceutical industry of Thailand and also improve its performance. The results of the study also contribute positively to the current adoption model of the pharmaceutical sector of Thailand. The given study also helps some top pharmaceutical firms in Thailand to enhance their performance by implementing an effective model of adoption of computer-assisted audit tools and methods.

This research paper is limited to the insights mainly gained from the pharmaceutical sector of Thailand and uses fewer methods to analyze data such as SEM, KMO, and CFA. Therefore, many options exist for future researchers to the extent of the research and conduct in other sectors as well as countries. Future researchers are also proposed to add other independent and dependent variables to the research along with other mediating variables. It is also recommended to future studies that they could evaluate CAATTs adoption at a more significant level.

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