

Forensic Accounting and Corporate Productivity in Thailand: Roles of Fraud Detection, Risk Reduction and Digital Capability

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ABSTRACT

The objective of this study was to examine the influences of forensic accounting on corporate productivity through fraud detection and risk reduction as the mediators and digital capability as the moderator. In this study, 460 listed firms in Thailand were the sample. Both structural equation model and multiple regression analysis were utilized to investigate the research relationships. This study presented that forensic accounting had a significant positive influence on fraud detection, risk reduction and corporate productivity. Fraud detection positively influenced risk reduction but did not influence corporate productivity. Next, risk reduction had a positive influence on corporate productivity, and it was an important mediator of the forensic accounting-corporate productivity relationships. In addition, digital capability was a significant moderator of the fraud detection-corporate productivity relationships and the risk reduction-corporate productivity relationships. Therefore, forensic accounting has become a key business tool in helping firms achieve sustained goals. Firms are encouraged to support and promote the application of forensic accounting in their organisations in order to succeed and survive for sustainable business strategies, technics and operations under rigorously turbulent environments.

Keywords: Forensic accounting; Fraud detection; Risk reduction; Digital capability; Corporate productivity

ARTICLE INFO

Article History:

Received: 30 November 2022

Accepted: 05 May 2023

Available online: 01 August 2023

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INTRODUCTION

Nowadays, situations, circumstances and environments in business activities, practices and operations have changed, converted and transformed continuously and uninterruptedly. They comprise complicated and complex health issues and subjects, growths of innovative digital and information technology, increases of stakeholders' requirements, expectations, needs, and wants, enlargements of existing effective competitors and new coming competent competitors, and expansions of numerous rules, laws and regulations in doing businesses and related others. They have become significant opportunities and threats with their influences on firms' competitiveness, performance, survival, and sustainability. Accordingly, firms are encouraged to implement effective and successful business strategies, technics, instruments, and tools in order to achieve sustainable competitive advantages and create long-term values, performance and growth. Better strategies, technics, instruments, and tools are positively related to outstanding superior outcomes. Dealing with the aforementioned topics, forensic accounting has been a valuable strategy and technique whereby financial data and non-financial information are gathered, monitored, studied, and analyzed for fraud-prevention purposes (Alshurafat, 2022). Forensic accounting has utilized accounting, auditing and investigative skills to conduct an examination into the finances of an individual or business. It has provided an accounting analysis as a suitable tool to be used in legal proceedings. Therefore, forensic accounting has become a strategic approach for financial crime and fraud prevention objectives and it aims at enhancing firms to succeed, survive and sustain in business operations.

Interestingly, forensic accounting is a key driver for preventing financial crimes and frauds, guaranteeing business transparency, corporate governance and corporate social responsibility and promoting operational efficiency, organisational effectiveness and firm sustainability. It refers to the creative way to combine financial accounting and investigate skills in a standard accepted way to address and uncover any fraudulent financial activities by involving the use of accounting, auditing and legal concepts, principles, theories, standards, methods, and technics in legal issues (Olaniyan et al., 2021). These fraudulent financial activities include errors in data collection and information analysis which become the foundations

of financial statements and reports, false accounting estimates, appraisals and evaluations derived from incorrect interpretation, and errors in the implementation and application of accounting principles and standards in relation to sums, classification and data presentation. Firms with forensic accounting implementation can ensure that manipulation, falsification and alteration of accounting notes or other supporting documents as the basis of financial reports, intentional misinterpretation or omission of important information and transactions, and misapplication of the accounting principles are met and prevented (Fadilah et al., 2019). They can minimize losses, detect financial fraud and crimes, improve efficiency, reduce exploitation risk, avoid legal problems, and improve brand reputation and authority (Alshurafat et al., 2021). Therefore, firms can achieve long-term business goals, successful organisational objectives and sustainable firm purposes under rigorous and uncertain competitive markets and environments.

In this study, fraud detection, risk reduction and corporate productivity were critical outcomes of firms' forensic accounting implementation. Greater forensic accounting implementation is significantly related to better fraud detection, risk reduction and corporate productivity. Firstly, fraud detection is defined as a set of knowledge-intensive activities embarked on to prevent property or financial resources from being obtained through illegal pretenses (Oyerogba, 2021). It has become the main activity immediately after fraud prevention has failed in an organisation and it involves identification of a fraud and a fraudster immediately after it is suspected. Firms with fraud detection can address the fraud problems and provide reliable solutions to businesses. They can achieve greater risk reduction and create superior productivity. In addition, fraud detection can link forensic accounting to corporate productivity and it plays an important role in mediating the forensic accounting-corporate productivity relationships. Secondly, risk reduction refers to an involvement of a behavioral, procedural or strategic modification approach aimed at reducing the probabilities of event occurrence and expecting financial, social or environmental crisis that could adversely influence a firm's cash flows (Jo & Na, 2012; Todinov, 2020). It deals with mitigating potential losses by reducing the likelihood and severity of possible loss. Firms with risk reduction can increase certainty of a satisfactory outcome or decrease the consequences of an unsatisfactory outcome in an organisation. Moreover, risk reduction is a connector between forensic accounting-corporate productivity and it can assist in mediating the

aforementioned relationships. Lastly, corporate productivity is the measure of how well resources are brought together in an organisation and utilised for accomplishing a set of great results (Anosa, 2021). It entails an effective integration of resources which yields higher output. It is the driving force behind a firm's efficiency, effectiveness, growth, and profitability. Firms with productivity can achieve success in meeting predefined objectives, targets and goals within a specified time target. They can improve economic growth production margin, profit maximization and organisational competitiveness. Accordingly, corporate productivity is an outstanding outcome of forensic accounting implementation.

In addition, digital capability is a moderator of the research relationships and it critically strengthens the relationships among forensic accounting, fraud detection, risk reduction, and corporate productivity. It is defined as an ability of firms through skill, talent and expertise to manage and utilise digital resources and technologies to support business strategies and processes, enhance innovative decision making and create organisational value (Keller et al., 2022). It can help firms quickly respond to digital transformation and successfully exploit rapid digital innovations. Firms with digital capability can provide more flexible digital relations between their internal and external resources and processes and to obtain a well-developed information management capability and a flexible information technology infrastructure. They can improve organisational performance and results by using digital resources and technologies to support complex decision processes. Therefore, digital capability is likely to moderate the aforementioned relationships. Greater digital capability is positively related to stronger research relationships.

This study aimed to investigate the influences of forensic accounting on corporate productivity of listed firms in Thailand. In addition, this study attempted to test the mediating influences of both fraud detection and risk reduction and the moderating influences of digital capability on the research relationships. The key research question was how forensic accounting has a positive influence on corporate productivity. The specific research questions were: (1) How forensic accounting positively influences both fraud detection and risk reduction, (2) How fraud detection positively influences both risk reduction and corporate productivity, (3) How fraud detection mediates the forensic accounting-corporate productivity relationships, (4)

How risk reduction positively influences corporate productivity, (5) How risk reduction mediates the forensic accounting-corporate productivity relationships and (6) How digital capability moderates all relationships, except for the fraud detection-risk reduction relationships.

The structure of this paper is as follows. First, it provides a brief background information and relevant literature review of forensic accounting and its consequences. The following section introduces research methods where it discusses the procedures and the data collection method. Next, it presents the research findings. Finally, it discusses research findings and provides further suggestions and limitations.

RELEVANT LITERATURE ON FORENSIC ACCOUNTING AND ITS CONSEQUENCES

Forensic accounting is a challenging concept. It is an ability of firms to investigate incidents of fraud, bribery, money laundering and embezzlement by analyzing financial records and transactions, tracing assets, and more. Securities fraud, asset misappropriation, insurance fraud, employee theft, falsification of financial statement information, identify theft, compensation disputes, and trademark and patent infringements are focused for forensic accounting. In this study, forensic accounting focused on how to effectively use this valuable capability to discover whether a crime occurs and if there are that acts of criminal intent. Interestingly, knowledge, as intangible and valuable resource, is the primary source of sustained competitive advantages and superior corporate performance (Grant, 1996). A knowledge-based view reflects firms' resources and capabilities that are derived from knowledge management, including the acquisition, integration, creation and utilisation. Firms have attempted to obtain and develop knowledge to produce capabilities to deal with the changing environments of criminality. They can utilize forensic accounting to achieve a good fit between management of changing environments of criminality and corporate productivity. Therefore, forensic accounting was a main determinant of corporate productivity in the study. In addition, both fraud detection and risk reduction are mediating variables and digital capability is a moderating variable. Figure 1 shows the conceptual model of the forensic accounting-corporate productivity relationships.

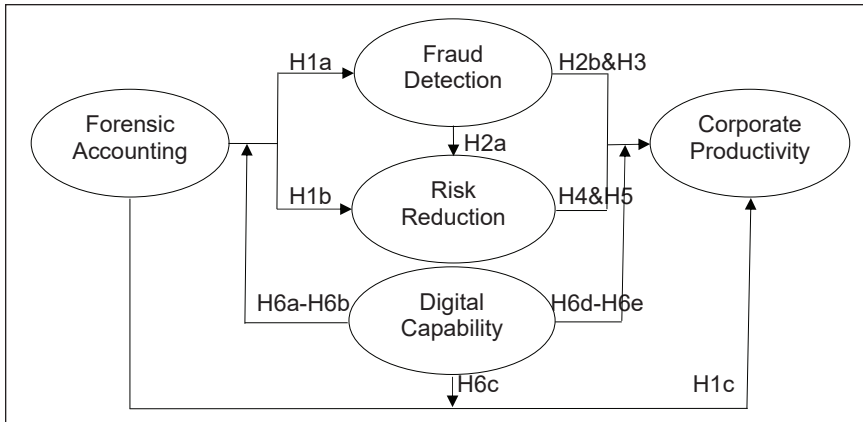


Figure 1: A Conceptual Model of the Forensic Accounting - Corporate Productivity Relationships

Corporate Productivity

To achieve excellence of forensic accounting implementation, corporate productivity is a key outcome of this implementation. In this study, corporate productivity is the heart of management goals because without it a firm may encounter losses (Udofia et al., 2021). It is defined as the measure of how well resources are brought together in an organisation and utilised for accomplishing of a set of great results (Anosa, 2021). It is an innovative measure of operations, practices and activities given efficient use of innovation and entails an effective integration of resources which yields higher output. It can reduce the use of resources, reduce cost use of better methods and improve factors of capabilities, competencies and abilities. It is the driving force behind a firm’s efficiency, effectiveness, growth, and profitability. Therefore, corporate productivity plays a more central role in determining success, survival and sustainability. Firms with productivity can provide a rich blend of efficiency and effectiveness in an organisation, make organisational functions better, drive outstanding competitiveness of their operations, and enhance an achievement for organisational goals under rigorously competitive markets and environments. They can achieve success of meeting predefined objectives, targets and goals within a specified time target by reducing the use of resources, reducing cost use of better methods and improving in factors of capabilities, competencies and abilities. They can improve economic growth production margin, profit maximization and

organisational competitiveness. Better financial performance, operational performance and strategic performance are the result from their greater productivity (Green, 2016). Accordingly, corporate productivity can obtain great result from successful application and implementation of forensic accounting concepts in an organisation.

Forensic Accounting

Forensic accounting is a strategic innovative approach of preventing and detecting financial crimes and frauds for the sake of legal interests. It consists of argumentative reports on implementing accounting, auditing and financial skills and investigating mentalities to unfinished issues related to evidence. It reflects firms' transparency, governance and social responsibility and enhances their efficiency, effectiveness and sustainability. In this study, forensic accounting is a comprehensive field of professional practice for fraud investigation by combining knowledge of accounting, auditing, investigation, law and regulations, communication, criminology, psychology, victimology, and digital technology (Tiwari & Debnath, 2017). It is defined as the creative way to combine financial accounting and investigate skills in a standard accepted way to address and uncover any fraudulent financial activities by involving the use of accounting, auditing and legal concepts, principles, theories, standards, methods, and techniques in legal issues (Olaniyan et al., 2021). It plays a significant role in the process of detecting, preventing and prosecuting the parties who are involved in a criminal activity such as financial misstatement, money laundering, misappropriation, embezzlement, and identity theft (Alshurafat, 2022). It involves fraud investigation, fraud prevention and anti-fraud control analysis and gathering of non-financial information of an organization. These fraudulent financial activities include errors in data collection and information analysis which become the foundations of financial statements and reports, false accounting estimates, appraisals and evaluations derived from incorrect interpretation, and errors in the implementation and application of accounting principles and standards in relation to sums, classification and data presentation. Therefore, forensic accounting is the knowledge of regulations and the application of special skills for the collection, analysis and evaluation of evidence materials, interpretation of them and disclosure of findings in the form of reports by detecting and preventing frauds, financial crimes, embezzlement and other criminal activities.

Firms with forensic accounting implementation can ensure that manipulation, falsification and alteration of accounting notes or other supporting documents as the basis of financial reports, intentional misinterpretation or omission of important information and transactions, and misapplication of the accounting principles are met and prevented (Fadilah et al., 2019). They can discover and prevent fraud, corruption and bribery cases, detect suspicious and anomalous transactions, high risk events and potential fraudulent behaviors and activities, create business valuation, and provide litigation support and expert witnessing (Rezaee & Wang, 2019). Moreover, firms can minimize losses, detect financial fraud and crimes, improve efficiency, reduce exploitation risk, avoid legal problems, and improve brand reputation and authority (Alshurafat et al., 2021). They can explicitly identify and avoid economic deception and divergent financial violation. Therefore, firms can achieve long-term business goals, successful organisational objectives and sustainable firm purposes under rigorous and uncertain competitive markets and environments. They can obtain potentiality of fraud detection, success of risk reduction and sustainability of corporate productivity. Hence, forensic accounting is hypothesized to have a positive influence on fraud detection, risk reduction and corporate productivity. Therefore,

H₁: Forensic accounting positively influences (a) fraud detection, (b) risk reduction and (c) corporate productivity.

Fraud Detection

Fraud detection is an important outcome of forensic accounting implementation and it is a result from successful forensic accounting practices in an organisation. Interestingly, fraud detection refers to a set of knowledge-intensive activities embarked on to prevent property or financial resources from being obtained through illegal pretenses (Oyerogba, 2021). It is a collection of processes and technics designed to identify, monitor and prevent frauds. It involves classification of cluster, segmentation of data and automatically finding association and rules in the data that may reveal interesting pattern, including those related to frauds (Tang & Karim, 2019). It has become the main activity immediately after fraud prevention has failed in an organisation and it involves identification of a fraud and a fraudster immediately after it is suspected. In addition, fraud detection is

defined as a set of activities and strategies undertaken to prevent money or property from being obtained through false pretenses (Rustiarini et al., 2021). It is also a process that detects, prevents and blocks the attempts of fraudsters from fraudulently obtaining money or property through false means and deceptions. Firms with fraud detection can identify possible predictors of fraud associated with known fraudsters and their actions in the past. They can recognise unauthorised activities where money or property is obtained through false pretenses, proceed and analyze the frauds and financial crimes by identifying and preventing unauthorised financial activities and address the fraud problems and provide reliable solutions to businesses. Accordingly, firms can have a security barrier using tools and procedures to safeguard money, information, and assets from being stolen. They can reduce their financial, operational and strategic risks and provide superior productivity through efficiency, effectiveness, competitiveness, growth, profitability, and sustainability. Indeed, fraud detection positively influences both risk reduction and corporate productivity. Moreover, fraud detection is a mediator of the research relationships as a go-between for forensic accounting and corporate productivity and it explains the how or why of an observed aforementioned relationship. It is an outcome of forensic accounting implementation. Furthermore, it is a determinant of corporate productivity in an organisation. In a mediation model, forensic accounting cannot influence corporate productivity directly, and instead does so by means of fraud detection, a ‘middle-man’. Therefore,

H₂: Fraud detection positively influences (a) risk reduction and (b) corporate productivity.

H₃: Fraud detection mediates the forensic accounting-corporate productivity relationships.

Risk Reduction

Risk reduction is a significant outcome of forensic accounting implementation and it is a major consequence of successful fraud detection practices. It is defined as an involvement of a behavioural, procedural or strategic modification approach aimed at reducing the probabilities of event occurrence and expected financial, social or environmental crisis that could influence adversely a firm’s cash flows (Jo & Na, 2012; Todinov, 2020). It

decreases probability of expected financial, social or environmental crisis that could adversely influence a firm's cash flows and and/or by generating more capital or goodwill which can provide insurance-like protection to preserve financial performance. It deals with mitigating potential losses by reducing the likelihood and severity of possible loss and the probability of event occurrence. Firms with risk reduction can address uncertainty in the marketplace, create controls that minimize or eliminate disruption, loss or damage to business operations, and reduce the impact of unwanted events on the business. They can increase the certainty of a satisfactory outcome or decrease the consequences of an unsatisfactory outcome in an organisation. They tend to have more stability of cash flows and utilise their resources that can be dedicated to strategic decisions and investments that contribute to reducing the financial risk perceived by the market (Benlemlih & Girerd-Potin, 2017). Moreover, firms can give assurance on the risk management process and that risks are correctly evaluated. They can evaluate risk management processes, report key risks and review management of key risks (Carcello et al., 2020). Greater potentialities of risk reduction can enhance firms to achieve more operational efficiency, management effectiveness, organisational competitiveness, business profitability, and corporate sustainability. Therefore, risk reduction is hypothesized to have a positive influence on corporate productivity. Interestingly, risk reduction is a mediator of the forensic accounting-corporate productivity relationships. It explains how or why there is a relation between forensic accounting and corporate productivity. It can be a potential mechanism by which forensic accounting can produce changes on corporate productivity. Accordingly, risk reduction is hypothesized to mediate the aforementioned relationships. Therefore,

H₄: Risk reduction positively influences corporate productivity.

H₅: Risk reduction mediates the forensic accounting-corporate productivity relationships.

Digital Capability

To strengthen the research relationships, digital capability was deemed a moderator of these relationships and it is defined as an ability of firms through skill, talent and expertise to manage and utilise digital resources

and technologies to support business strategies and processes, enhance innovative decision making and create organisational value (Keller et al., 2022). It is an organisational capability which involves human, collaboration, technic, and innovation capability for moving toward digitalization. It can help firms quickly respond to digital transformation and successfully exploit rapid digital innovations. In addition, digital capability refers to the ability to use emergent technological applications for business innovation to create value for customers, suppliers and the firm itself (Proksch et al., 2021). It is a behaviour of digital sensing, digital capture and digital transformation that further assists firms to achieve digital transformation goals, business objectives and targets. It is a combination of knowledge, skills and attitudes for a confident, critical and creative use of innovative technologies for achieving goals related to work, employability, learning, leisure, inclusion, and participation in society (Malchenko et al., 2020). Firms with digital capability can provide more flexible digital relations between their internal and external resources and processes with a well-developed information management capability and a flexible information technology infrastructure. They can generate new activities and goals, create opportunities and raise the bar for the competences to be obtained and mastered. Moreover, firms can utilise technologies to repeatedly perform a productive task which relates either directly or indirectly to their capacities for creating value through affecting the transformation of inputs into outputs (Ritter & Pedersen, 2020). They can use digital resources and technologies to support complex decision processes and contribute value creation in order to improve organisational performance and results and achieve business goals, objectives, targets, and purposes, such as success, growth, survival, and sustainability. Accordingly, digital capability can enhance firms to obtain great business operations, practices and activities. It critically strengthens the associations among forensic accounting, fraud detection, risk reduction, and corporate productivity. Furthermore, it positively moderates the research relationships. Digital capability is hypothesized to moderate the aforementioned relationships. Therefore,

H₆: Digital capability moderates (a) the forensic accounting-fraud detection relationships, (b) the forensic accounting-risk reduction relationships, (c) the forensic accounting-corporate productivity relationships, (d) the fraud detection-corporate productivity relationships, and (e) the risk reduction-corporate productivity relationships.

RESEARCH METHODOLOGY

Listed Firms in Thailand as the Sample of the Study

Listed firms in Thailand are both large-sized enterprises and considerable public businesses that have a great impact on Thailand's economies, societies and environments. They are public company limited officially approved by the Securities and Exchange Commission of Thailand (SEC) and the Stock Exchange of Thailand (SET) to offer security sales to people. Their qualifications meet the requirements and criteria and comply with listing agreements. These listed firms are classified as 8 groups, including agro and food industry, consumer products, financials, industrials, property and construction, resources, services, and technology. Providing best business practices, operations, functions, and strategies through corporate social responsibility, corporate governance and business ethics, forensic accounting reflects an awareness of these requirements and concerns. It can gain competitive advantages, succeed, survive and sustain in the competitive markets. Therefore, these listed firms in Thailand were considered suitable samples of the study. The key informants were internal auditing executives, namely chief internal auditing officer, internal auditing director, internal auditing manager or other internal auditing executives.

Data Collection

In this study, 858 key participants from the targeted firms were contacted. The data was collected through mailed questionnaires with dichotomous scales. To encourage candid responses, the participants were ensured that their responses would be kept confidential. Overall, 486 responses were received. Of the surveys completed and returned, 460 were usable. The effective response rate was approximately 53.61%. With an appropriate follow-up procedure suggested by Aaker et al. (2001), the response rate for a mailed survey as being greater than 20 was considered acceptable. To assess and verify potential non-response bias, this study compared the first one-third of the respondents with the last one-third of respondents on key demographic variables, including firm age, firm size and firm capital (Armstrong & Overton, 1977) and found no statistically significant differences at a 95% confidence level as firm age ($t = 0.21, p > .05$), firm size ($t = 0.18, p > .05$) and firm capital ($t = 0.16, p > .05$) that would suggest at non-response bias.

Variables and Measures

In this study, measurements of the constructs were self-developed from existing literature. These measurements used a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree), except for control variables. Firstly, thirteen-item scale of forensic accounting was issued to assess how firms had combined knowledge of accounting, auditing, investigation, law and regulations, communication, criminology, psychology, victimology, and digital technology by involving the use of concepts, principles, theories, standards, methods, and technics in order to address and uncover any fraudulent financial activities, such as financial misstatement, money laundering, misappropriation, embezzlement, and identity theft (Olaniyan et al., 2021; Tiwari & Debnath, 2017). Secondly, nine-item scale of fraud detection was developed to measure how firms had provided activities and strategies undertaken to prevent money or property from being obtained through false pretenses and to detect and block the attempts of fraudsters from obtaining money or property fraudulently through false means and deceptions (Oyerogba, 2021; Tang & Karim, 2019). Thirdly, seven-item scale of risk reduction was established to gauge how firms had dealt with mitigating potential losses by reducing the likelihood and severity of possible loss and the probabilities of event occurrence and expected financial, social or environmental crisis that could adversely influence their cash flows (Jo & Na, 2012; Todinov, 2020). Fourthly, seven-item scale of digital capability was developed to evaluate how firms had managed and utilized digital resources and technologies for moving toward digitalization in supporting business strategies and processes, enhancing innovative decision making and creating organizational value (Keller et al., 2022; Proksch et al., 2021). Lastly, nine-item scale of corporate productivity was developed to critically determine how firms had brought efficient use of innovation and resources (human, financial, material, machine, time, and environment) in an organization for accomplishing a set of great results and increasing the values added content of products, services and organisations (Anosa, 2021; Udofia et al., 2021). In addition, firm age (FA), firm size (FS) and firm capital (FC) were control variables of the study. FA was measured by the number of years a firm had been in existence (Zahra et al., 2000) using a dummy variable as less than 15 years = 0 and equal to or greater than 15 years = 1. Next, FS was measured by the number of employees in a firm (Arora and Fosfuri, 2000) using a dummy variable as less than 500 employees = 0 and equal to or greater than 500 employees = 1. Moreover,

FC was measured by the amount of money a firm had invested in doing business (Ussahawanitchakit, 2007) using a dummy variable as less than 10,000 million baht = 0 and equal to or greater than 10,000 million baht = 1.

Verifying the Quality of Research Tool

To verify the quality of research tool, factor loadings, Cronbach alpha coefficients and item-total correlations were investigated (Hair et al., 2010). The factor loadings served as a data reduction method designed to explain the correlations between observed variables using a smaller number of factors. They are greater than 0.60. Next, Cronbach alpha coefficients were measures of internal consistency, that are, how closely related a set of items were as a group. They are considered to be measures of scale reliability. They were achieved with scoring greater than 0.07. Finally, item-total correlations arose where numbers of tests or questions were given to an individual and where the problem was to construct a useful single quantity for each individual that could be used to compare that individual with others in a given population. They were greater than 0.30 indicating the achievement of the convergent validity. Based on these criteria, all the indices were accepted. Table 1 presents the validity and reliability results used in this study.

Table 1: Results of Measure Validation

Items	Factor Loadings	Item-total Correlation	Cronbach Alpha
Corporate productivity (CP)	0.64-0.88	0.66-0.84	0.93
Forensic accounting (FA)	0.69-0.83	0.63-0.85	0.92
Fraud detection (FD)	0.67-0.88	0.78-0.86	0.86
Risk reduction (RR)	0.83-0.92	0.82-0.93	0.94
Digital capability (DC)	0.65-0.89	0.69-0.89	0.83

Hypotheses Testing and Tests of Measurement Model Fit

In this study, both structural equation model and multiple regression analysis were utilized to examine the research hypotheses. For testing the direct and mediating hypotheses, structural equation model was employed to investigate the relationships among forensic accounting, fraud detection, risk reduction, and corporate productivity. In addition, multiple regression analysis was used to test the roles of digital capability as the moderator

of the research relationships. To assess the measurement model fit of the research relationships, the comparative fit index (CFI), the goodness of fit index (GFI), the incremental fit index (IFI), and the root mean square error of approximation (RMSEA) were methods and the most important indices of the maximum likelihood estimation. They were used to gauge the model fit (Awang, 2014). The measurement model was performed with all constructs included. The model for indices is achieved (CFI = 0.91, GFI = 0.93, IFI = 0.94, and RMSEA = 0.05). Here, this study continued further when at least three of the indices met the threshold requirement according to Hair et al. (2010). Thus, the initial test of the measurement model resulted in the good fit to the data. Therefore, the results of this study are presented in the next section.

RESULTS AND DISCUSSION

Table 2 presents the descriptive statistics and correlation matrix for all variables. Multicollinearity might occur when inter-correlation in each predict variable is more than 0.80, which suggests a strong relationship (Hair et al., 2010). Variance inflation factor (VIF) is also a measure of the amount of multicollinearity in a set of multiple regression variables. It is equal to the ratio of the overall model variance to the variance of a model that includes only that single independent variable. The value of VIF less than 10 is acceptable (Hair et al., 1995). The correlations ranged from 0.31 to 0.72 at the $p < 0.05$ level and the VIF ranged from 1.13 to 2.69, which suggested that the possible relationships of the variables in the conceptual model could be tested. Thus, there were no substantial multicollinearity problems encountered in this study.

Table 2: Descriptive Statistics and Correlation Matrix

Variables	CO	FA	FD	RR	DC
Mean	4.01	4.12	4.10	4.13	4.30
s.d.	0.51	0.51	0.59	0.52	0.46
CO					
FA	0.53***				
FD	0.37***	0.72***			
RR	0.60***	0.53***	0.50***		
DC	0.58***	0.43***	0.31***	0.44***	

*** $p < .01$

Table 3 presents the results of path coefficients and hypotheses testing of the direct and mediating hypotheses for the relationships among forensic accounting, fraud detection, risk reduction, and corporate productivity. Figure 2 shows a summary of the forensic accounting-corporate productivity relationships. Forensic accounting plays a significant role in the process of detecting, preventing and prosecuting the parties who are involved in any criminal activity such as financial misstatement, money laundering, misappropriation, embezzlement, and identity theft (Alshurafat, 2022). It has a positive influence on fraud detection ($b = 0.82, p < 0.01$), risk reduction ($b = 0.37, p < 0.01$) and corporate productivity ($b = 0.37, p < 0.01$). Firms with forensic accounting implementation have collected, analysed, evaluated, and interpreted evidence materials and disclosed findings in the form of reports by ensuring that manipulation, falsification and alteration of accounting notes or other supporting documents as the basis of financial reports, intentional misinterpretation or omission of important information and transactions, and misapplication of the accounting principles are met and prevented. They can discover and prevent fraud, corruption and bribery cases, detect suspicious and anomalous transactions, high risk events and potential fraudulent behaviors and activities, create business valuation, and provide litigation support and expert witnessing. *Therefore, Hypotheses 1a-1c were supported.*

Table 3: Results of Path Coefficients and Hypotheses Testing

Hypotheses	Relationships	Coefficients	t-value	Results
H1a	FA à FD	0.82***	10.63	Supported
H1b	FA à RR	0.37***	3.13	Supported
H1c	FA à CO	0.37***	3.42	Supported
H2a	FD à RR	0.21**	2.09	Supported
H2b	FD à CO	0.11	1.17	Not supported
H3	FA à FD	0.82***	10.63	Not supported
	FD à CO	0.11	1.17	
H4	RR à CO	0.46***	5.32	Supported
H5	FA à RR	0.37***	3.13	Supported
	RR à CO	0.46***	5.32	

p<.05, *p<.01, CFI = 0.91; GFI = 0.93; IFI = 0.94; RMSEA = 0.05

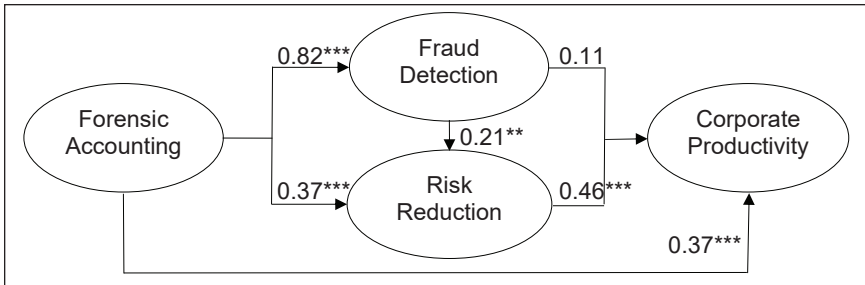


Figure 2: A Summary of the Forensic Accounting - Corporate Productivity Relationships

In addition, fraud detection positively influences risk reduction ($b = 0.21, p < 0.04$). It provides knowledge-intensive activities embarked on to prevent property or financial resources from being obtained through illegal pretenses (Oyerogba, 2021). It involves identification of a fraud and a fraudster immediately after it is suspected. Firms with fraud detection can prevent and block the attempts of fraudsters from fraudulently obtaining money or property through false means and deceptions. They can recognise unauthorised activities where money or property is obtained through false pretenses, proceed and analyze the frauds and financial crimes by identifying and preventing unauthorised financial activities and address the fraud problems and provide reliable solutions to businesses. Accordingly, firms can reduce their financial, operational and strategic risks. *Therefore, Hypothesis 2a is supported.* Surprisingly, fraud detection does not influence corporate productivity ($b = 0.11, p < 0.25$). According to the existing literature, fraud detection is likely to affect superior productivity in an organisation through efficiency, effectiveness, competitiveness, growth, profitability, and sustainability. However, corporate productivity was measured through reducing use of resources, reducing cost use for better methods and improving factors of capabilities, competencies, abilities and the values added content of products, services and organisations (Udofia et al., 2021). Thus, fraud detection may not directly influence corporate productivity. *Therefore, Hypothesis 2b was not supported.* Furthermore, fraud detection is not a mediator of the forensic accounting-corporate productivity relationships because it is not a go-between for these two variables and it is an outcome of forensic accounting implementation. However, it is not a determinant of corporate productivity in an organisation.

Thus, fraud detection does not mediate the aforementioned relationships. *Therefore, Hypothesis 3 was not supported.*

Interestingly, risk reduction had an important influence on corporate productivity ($b = 0.46, p < 0.01$). In the existing literature, risk reduction involves behavioural, procedural and strategic modification approaches aimed at reducing the probabilities of event occurrence and expected financial, social or environmental crisis that could adversely influence a firm's cash flows (Jo & Na, 2012; Todinov, 2020). Firms with risk reduction can address uncertainty in the marketplace, create controls that minimize or eliminate disruption, loss or damage to business operations, and reduce the impact of unwanted events on the business. They can increase the certainty of a satisfactory outcome or decrease the consequences of an unsatisfactory outcome in an organisation. Thus, they can achieve more operational efficiency, management effectiveness, organisational competitiveness, business profitability, and corporate sustainability. *Therefore, Hypothesis 4 was supported.* Similarly, risk reduction was a significant outcome of forensic accounting implementation. Indeed, it had a positive influence on corporate productivity. It is a potential mechanism by which forensic accounting can produce changes on corporate productivity. Thus, risk reduction was a mediator of the aforementioned relationships. *Therefore, Hypothesis 5 was supported.*

Table 4 presents the results of multiple regression analysis and the hypotheses testing of the moderating research relationships. In this study, digital capability positively moderated the fraud detection-corporate productivity relationships ($b = 0.19, p < 0.03$) and the risk reduction-corporate productivity relationships ($b = 0.19, p < 0.03$), but did not moderate the forensic accounting-fraud detection relationships ($b = 0.04, p < 0.52$), the forensic accounting-risk reduction relationships ($b = 0.05, p < 0.57$) and the forensic accounting-corporate productivity relationships ($b = 0.02, p < 0.77$). It is an ability of firms to manage and utilise digital resources and technologies (digital sensing, digital capture and digital transformation) to support business strategies and processes, enhance innovative decision making and create organisational value (Keller et al., 2022). Firms with digital capability can obtain a well-developed information management capability and a flexible information technology infrastructure to improve organisational performance and results and achieve business goals, such as

success, growth, survival, and sustainability. Thus, digital capability was a moderator of the fraud detection-corporate productivity relationships and the risk reduction-corporate productivity relationships. *Therefore, Hypotheses 6d-6e were supported, but the rests were not.*

Table 4: Results of Multiple Regression Analysis and Hypotheses Testing^a

Independent Variables	Dependent Variables			
	FD	RR	CO	CO
FA	0.72*** (0.08)	0.45*** (0.09)	0.37*** (0.09)	
FD				0.07 (0.09)
RR				0.40*** (0.09)
DC	0.01 (0.08)	0.21** (0.09)	0.37*** (0.09)	0.36*** (0.08)
FA*DC	0.04 (0.07)	0.05 (0.08)	0.02 (0.08)	
FD*DC				0.19** (0.08)
RR*DC				0.19** (0.08)
FA	0.05 (0.06)	0.09 (0.07)	0.10 (0.07)	0.09 (0.06)
FS	0.11 (0.05)	0.03 (0.06)	0.07 (0.06)	0.06 (0.06)
FC	0.01 (0.05)	0.04 (0.06)	0.06 (0.06)	0.08 (0.06)
Adjusted R ²	0.51	0.32	0.38	0.44

p<.05, *p<.01, ^aBeta coefficients with standard errors in parenthesis.

CONTRIBUTIONS AND DIRECTIONS FOR FUTURE RESEARCH

Theoretical Contribution and Directions for Future Research

Knowledge is a key source of sustainable competitive advantages based on the knowledge-based view theory of firms. This study confirmed that forensic accounting as valuable knowledge is successfully employed to protect and manage the crimes in an organization. Better forensic accounting

implementation was significantly and positively related to greater corporate productivity. Therefore, forensic accounting was a main determinant for achieving sustainable competitive advantages and superior performance in long-term business operations. To expand and add value to the current study, future research may need to classify and determine dimensions and components of forensic accounting in order to create and increase benefits and advantages of the research results. Next, future research may need to search for other antecedents of forensic accounting implementation in an organisation, such as internal factors (business vision, top management support, transformational leadership, organisational learning, resource readiness, and internal audit experience) and external factors (stakeholder requirement, competitive force, legal concern, technology growth, environmental change, and customer need). To enhance generalisability of the results of the current study, future research may need to collect data from other populations, such as government agencies, stated-owned enterprises and others. Finally, future research may need to conduct a comparative study by collecting data from a different group or larger groups and utilise this study's results for setting plans and directions of firms' existing operations in future environments.

Managerial Contribution

Forensic accounting is a key business tool of strategies, technics, operations, practices, and actives in an organisation and it can enhance to succeed, survive and sustain in current, future and long-term competitive markets and environments. Accordingly, firms are encouraged to support and promote learning and understanding of forensic accounting characteristics and qualifications in order to successfully apply and implement it. In addition, they need to allocate resources, assets and capabilities in order to achieve maximum benefits and advantages of forensic accounting implementation. Moreover, firms need to encourage their employees to study for better understanding of the system of forensic accounting and implementing it in their business practices, operations and activities. Skills, competencies and abilities of their employees can definitely help firms achieve efficiency, effectiveness and success of forensic accounting implementation. In addition, digital technology has grown continuously. It has affected business strategies, techniques and operations in the current and future perspectives. Therefore, firms need to know digital technology

and use it as an innovative technology instrument, such as valuable database and critical platform for creating their sustainable competitiveness and outstanding performance. Finally, integrative approaches, methods and procedures from different disciplines, namely accounting, auditing, finance, law, public finance, economic, behavioral science, digital technology, and others are considered important for forensic accounting implementation. Utilizing these multidisciplinary approaches can assist firms in implementing the applications of forensic accounting in current and future operations. In summary, firms can apply and implement the concept and system of forensic accounting as a strategic tool in assisting them to achieve long-term survival and sustainability.

CONCLUSION

Recently, forensic accounting has become a suitable business tool in preventing crimes and creating transparent operations in an organisation. This study aimed to investigate the influences of forensic accounting on fraud detection, risk reduction and corporate productivity. In addition, this study examined the mediators of both fraud detection and risk reduction and the moderator of digital capability on the research relationships. A total of 460 listed firms in Thailand were the sample of the study. Structural equation model is employed to test the directing and mediating influences and multiple regression analysis is utilised to investigate the moderating influences. The results of the study suggested that forensic accounting significantly and positively influences fraud detection, risk reduction and corporate productivity. Next, fraud detection has a significant positive influence on risk reduction, but it does not influence corporate productivity. It was not the mediator of the forensic accounting-corporate productivity relationships. Moreover, risk reduction was an important determinant of corporate productivity. It is the mediator of the forensic accounting-corporate productivity relationships. Interestingly, digital capability significantly moderates the fraud detection-corporate productivity relationships and the risk reduction-corporate productivity relationships. To expand the current study, future research is needed to classify and determine dimensions and components of forensic accounting, search for internal and external factors of forensic accounting implementation in an organisation, collect data from government agencies, stated-owned enterprises and others, and use a

comparative study to collect data from a different group or larger groups. In summary, firms can utilize forensic accounting as a key strategic business tool by allocating resources, assets, capabilities, and budgets for their successful implementation in order to protect crime operations, promote transparent practices, creating sustainable competitive advantages, and achieve long-term performance, survival and sustainability.

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