


The Effect of Auditor's Personal Characteristics on Professional Judgment and Ethics in Auditing

Hoang To Loan Nguyen, School of Accounting, University of Economics Ho Chi Minh City, Ho Chi Minh City, Vietnam*

 <https://orcid.org/0000-0002-3557-6726>

ABSTRACT

In the turbulent environment of the current business world, making professional judgment and maintaining professional ethics is an essential requirement in the auditing profession. Besides technical and professional knowledge, the personal information of each individual auditor could affect the process of making judgments and maintaining the ethics of the auditor. This study aims to analyze the influences of auditor's personal information on professional judgment and ethics in external auditing process. The authors designed a survey and analyzed the responses, applied a linear regression model, and performed a t-test to measure the model. They found that the auditors who obtain the ACCA or CPA tend to use their professional judgment in the planning phase. Interestingly, the CPA certificate is a nearly significant factor affecting the professional judgment in the planning phase. For the ethics, the auditors who have an MBA degree tend to use ethical thinking in the planning phase. Surprisingly, only the auditors who are managers tend to use ethical thinking in the concluding and reporting phase.

KEYWORDS

Auditing, Ethics Analysis, Human Factor, Linear Regression Model, Machine Learning, Professional Judgment Analysis, Student T-Test Statistics

1. INTRODUCTION

Decision-making is a crucial but challenging process in practical auditing contexts. This process is of the utmost importance in order to enhance the auditor's decisions and audit quality. New research approaches highlight that the audit decision making process relates to knowledge, professional judgment and ethical application (Nguyen and Kohda, 2017a, 2017b; Nguyen, 2021). Hence, in the turbulent and uncertain environment of the current business world, practising auditors not only need to have sufficient knowledge but also an adequate ability to make professional judgment and apply ethical principles.

Practically, professional institutions, such as International Standards on Review Engagements, emphasize that the appropriate competence and capabilities of an audit team are not only the understanding of professional standards, applicable legal, and regulatory requirements but also

DOI: 10.4018/IJKSS.329241

*Corresponding Author

This article published as an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>) which permits unrestricted use, distribution, and production in any medium, provided the author of the original work and original publication source are properly credited.

practical experience, technical expertise, knowledge of relevant industries, and the application of professional judgment (IAASB, 2013). In these factors, besides the audit professional factors (such as technical knowledge of accounting and auditing standards, legal and regulatory understandings), the individual factors (such as gender, age, position, academic degrees and auditing certificates that the auditors obtained) could affect the process of audit judgment and ethics.

While employing many types of explicit knowledge such as technical knowledge, general business knowledge, and subspecialty knowledge (Nguyen, 2021), practicing auditors also apply their implicit ability to professionally make judgment and ethically make decisions. Prior research indicated that there are many factors impacting an auditor's knowledge (Nguyen and Kohda, 2017a, 2017b; Nguyen, 2021). For instance, prior research highlights that knowledge types, experience, expertise, and memory are predominant requirements in auditing (Weber, 1980; Libby, 1981, 1983, 1995; Solomon et al., 1999; Bonner, 2008). However, there were not many studies about factors that can influence professional judgment and ethical application in auditing.

To address the above research gap, this research aims to investigate the impact of the auditor's personal information on the professional judgment and ethical application in each phase of the auditing process including the planning phase, the fieldwork phase, and the concluding and reporting phase. The major research question used was *"How do auditor's personal characteristics influence on professional judgment and ethics in each phase of the external auditing process?"*

To answer the research question, we conducted a survey of 74 participants, and analyzed the responses by using linear regression model and the t-test statistics.

Our results reveal some interesting findings. First, the auditors who obtained the accounting certificate ACCA (Association of Chartered Certified Accountants ACCA) or CPA (Certified Public Accountant) tend to use their professional judgment in the planning phase. Especially, the latter (i.e., CPA) is a nearly significant factor affecting the decision making in the planning phase. Furthermore, the auditors who got an MBA degree tend to use ethics in the planning phase. Surprisingly, only manager auditors who really use ethics in the decision making of the final concluding and reporting phase.

The remainder of this paper is organized as follows. The related work is described in Section 2. The research methodology is introduced in Section 3. Then research findings are presented in Section 4. And, discussion and conclusion is analyzed and drawn in the final section.

2. LITERATURE REVIEW

In this section, we introduce the related work about professional judgment and ethics in auditing and in other fields.

2.1 Professional Judgment and Ethics in Auditing

Besides knowledge, professional judgment and ethical virtue are crucial competence in order to make appropriate audit decisions. This session describes a brief review on the concept of professional judgment, ethical requirements, and factors that could affect professional judgment and ethics in auditing.

2.1.1 Professional Judgment

Professional judgment is both an empirical and academic critical concept. In accordance with the International Standards of Auditing 200 (ISA 200), professional judgment is "the application of relevant training, knowledge and experience, within the context provided by auditing, accounting and ethical standards, in making informed decisions about the courses of action that are appropriate in the circumstances of the audit engagement" (IAASB, 2010). Professional judgment is particularly important when practicing auditors gather audit evidence, evaluate audit evidence, and draw conclusions about the auditing process based on evidence. (Louwers et al., 2021).

An auditor usually applies their professional judgment in the audit process, and the result of an audit is an opinion for which an auditor makes several subjective judgments to form the opinion.

AICPA (1955) stated that “judgment is the most important factor in the making of any audit, but in many situations, it is practically impossible to write out in specific language how the auditor applies judgment.” Nguyen and Kohda (2017a) emphasized that auditors usually exercise their professional judgment in every phase of audit processes. Although judgment is subjective, it is very important since it relates to audit decision making and audit quality. Professional judgment enables auditors to deal with their tasks effectively and efficiently (Nguyen, 2017). Therefore, the importance and pervasiveness of professional judgment auditing has been recognized in both professional and academic literature.

Previous research revealed that there are certain factors can impact to audit professional judgment such as accumulated knowledge (Libby, 1995; Nguyen and Kohda, 2017a, 2017b), experience and expertise (Bonner, 2008), existing working environment (Nguyen and Kohda, 2017a, 2017b), and personal characteristics of auditors (Şişmanoğlu, & Arikboğa, 2018; Halim et al., 2018). In these factors, personal characteristics are one of the most important factors. In terms of the practical implications, recent studies provided insights into personal factors that influence professional judgment of practising auditors. For example, Halim et al. (2018) indicated that the position level and experience is significant in determining the level of professional judgment of auditors. Şişmanoğlu & Arikboğa (2018) revealed that personal factors have an effect on the use of professional judgment, such as education, experience, psychological condition, and sector expertise.

2.1.2 Professional Ethics

In external auditing, practitioners recognised that “ethics is the core value to auditors” (Nguyen and Kohda, 2017a) since ethical compliance is a compulsory competence of the auditors. Recently, there have been many scandals of the ethical violations in auditing, especially for high level positions, such as Enron (2002), Worldcom (2002), Olympus (2011), and so on. In those cases, the auditors acknowledged the potential violation but they did not behave ethically and led to the serious penalties. Therefore, ethical requirements increasingly become an important competence in auditing. In internal auditing, Everett and Tremblay (2014) highlighted that the Institute of Internal Auditors (IIA) can offer ethics-related resources and the ability to effectively develop a moral skill. Samsonova-Taddei and Siddiqui (2016) evaluated the capacity of the content of regulation to promote audit ethics by reference to the European Union’s (EU) audit policy. The authors found that the restricted view of audit ethics from the EU regulators can limit the policy to effectively stimulate the ethical commitment of the auditors. In governmental auditing, Bringselius (2018) explained why the Supreme Audit Institutions (SAIs) need to enhance ethical audits besides efficiency, economy, and effectiveness. Suryanto (2017) examined the impact of cultural ethics from Javanese (people living in Java Indonesia) in professional accountants and found that the participants are not interested in being whistle-blowers.

In other fields, Collins and Collins (2016) examined the professional judgment and decision-making processes in adventure sports coaching but just for high-level coaches. Taylor (2016) explored the potential use of heuristic such as ‘rule-of-thumb’ models of cognitive judgment in social work, and recognized that human beings cannot simultaneously process too many factors with associated statistical weightings. Hart et al. (2016) analyzed and Structured Professional Judgment (SPJ) in violence risk assessment. SPJ is used to understand and mitigate the risk for interpersonal violence posed by people that is discretionary but relies on evidence-based guidelines to systematize the exercise of discretion. Martinov-Bennie and Mladenovic (2015) provided evidence of the impact of ethics education in the first-year unit of study on the ethical sensitivity and judgment of the accounting students.

Besides, Houghton (2015) studied the current exclusion of young voices from the development of ethical praxis and outlined a participatory ethical approach that can promote the inclusion and empowerment of young survivors in research and policy. Elbeltagi and Agag (2016) proposed a comprehensive model that can explain the impact of online retailing (e-retailing) ethics on customer satisfaction and the intention of re-purchasing using trust-commitment theory and cultural perspective. Tuncay Zayer and Coleman (2014) found evidence that advertising professional’s perceptions about

women's vulnerability and men's immunity to the negative consequences of advertising, societal discourses, and institutional dynamics that drive their business decisions.

3. RESEARCH METHODOLOGY

This study aims to investigate the influences of auditor's personal characteristics on their professional judgment and ethics during the decision making process in auditing. The research objective leads us to the use of the following major research question: "How do auditor's personal characteristics influence professional judgment and ethics in each phase of the external auditing process?"

To find out the answer of this question, we conducted a survey research that is a suitable approach to achieve the depth and breadth of the research question. In analyzing the survey data, we applied linear regression with Ordinary Least Squares (OLS) to measure whether the auditors' personal characteristics affect to their professional judgment and ethics in decision making.

- **Linear Regression:** Linear regression, also called multiple regression (Freedman, 2009; Rencher and Christensen, 2012; Yan and Su, 2009), is a statistical method used for measuring whether a set of factors affect (or can be used to predict) a certain outcome. Linear regression can model the relationship between one or more independent (explanatory) variables and one dependent (output) variable. The value of the target function is expected to be a linear combination of the features (explanatory variables). In this research the linear regression is appropriate for applying to find out the answer of the research question.
- **Ordinary Least Squares (OLS):** OLS is one of the most common methods used in linear regression statistics. OLS was originally proposed in (Harter, 1974) and then has been formally described and improved in many papers, for instance (Dhillon et al., 2013; Sheffet, 2017; Helland et al., 2018). Formally, OLS fits a linear model with the coefficients to minimize the residual sum of squares between the observed targets in the dataset, and the targets predicted by the linear approximation. In this study, we apply OLS since it is the common estimation method for linear models and it is appropriate to the research question.
- **(Student) T-Test:** The student t-test was originally introduced in (Student, 1908) and has been commonly used today (Thao et al., 2019; 2020a; 2020b). It is a statistical method used for determining whether the means of two certain groups are significantly different related to the features. The t-test first defines a null hypothesis that the observed sample mean, and the hypothesized population mean has no effective difference (in other words, any measured difference just occurs by chance). If the difference is significantly larger than a threshold determined by the appropriate reference distribution, the null hypothesis is rejected. In this research, we apply t-test to find which factors affect the target functions. The *t*-test is applied to find the *p*-value for each factor, and the one that has $p \leq 0.05$ is the one chosen for the results.

3.1 Data Collection

In this section, we describe the process of how the survey was designed and distributed to the participants. The survey was conducted in English by using Google Form¹, which is a reliable online survey tool supported by Google. The survey was distributed to 74 participants who are working as auditors in Vietnam. The webform was designed such that the participants cannot submit their responses if any of the questions are not answered (all the questions require mandatory answers). For the privacy consent, we mentioned to the participants that any personal information is only used for the research purpose; and all of them finally agreed to participate in answering the survey. The survey consists of three parts: demographics, work experience, and impact of professional judgment and ethics to decision making in auditing.

3.1.1 Demographics

The content related to human demographics consists of the following two questions:

1. **Gender:** This question is a single-choice question² with two answer options (male and female). The values are then standardized as binary numbers such as male: 1 and female: 0.
2. **Work Position:** This question is also a single-choice question with five answer options (assistant, senior, manager, director, and partner). The answer options are then parsed into five sub-questions (corresponding to the five answer options). For each answer option, the values are standardized as binary numbers such as yes: 1 and no: 0.

3.1.2 Work Experience

The content related to work experience consists of the following four questions:

1. **Number of years that the participants have worked in auditing:** The input values are integers.
2. **Number of auditing projects that the participants have done:** The input values are integers.
3. **Certificates:** This question is about the auditing certificates that the participants have obtained. This question is a multiple-choice question³ with three answer options (ACCA⁴, VACPA⁵, and CPA⁶ which are the most popular auditing certificates in Vietnam). The answer options are then parsed into three sub-questions and for each answer option, the values are standardized as binary numbers such as yes: 1 and no: 0
4. **Education:** This question is about the highest degree of auditing or accounting that the participants have obtained. This is a single-choice question with two answer questions (Bachelor and MBA). The answer options are then parsed into two sub-questions. For each answer option, the values are standardized as binary numbers such as yes: 1 and no: 0

3.1.3 Professional Judgment and Ethics in Decision Making of Auditing

This part assesses the impact of auditors' professional judgment and ethics on their decision making during three phases of an audit process (planning phase, fieldwork phase, and concluding or reporting phase). The content consists of the following questions:

1. Impact of professional judgment in the planning phase.
2. Impact of professional judgment in the fieldwork phase.
3. Impact of professional judgment in the concluding and reporting phase.
4. Impact of ethics in the planning phase.
5. Impact of ethics in the fieldwork phase.
6. Impact of ethics in the concluding and reporting phase.

Each question is a single-choice question with 10-point Likert-scale answer options from 1 to 10 representing from low impact to high impact.

3.2 Testing Model

Let f denote the model used to evaluate the influences of the personal characteristics on the auditor's professional judgment and ethics during their decision making process (*cần viết rõ lại mục tiêu nghiên cứu*). f is defined as follows:

$$f = demogr + wepx \quad (1)$$

where $demogr$ and $wepx$ denote the set of variables of demographics and work experience, respectively.

3.2.1 Variables

The explanatory variables related to *demogr* are genders and positions (including assistant, senior, manager, director, and partner). The explanatory variables related to *wepx* are the number of working years, the number of projects, ACCA, VACPA, CPA, bachelor, and MBA. The distribution of the thirteen variables is given in Table 1. The variables #7 (*nyear*) and #8 (*nprojects*) contain continuous values not binary values like the others. The distributions are given in Figures 1 and 2, respectively.

In Table 1, it can observe that some variables (in the case of binary values) have a low distribution for one of the values. For instance, the variables #5 (*partner*), #6 (*director*), and #12 (*bachelor*) have only 1.37% of distribution of the value '1' (or 'yes'). In other words, the number of participants who are partners, directors, or have the highest degree in auditing as a bachelor is only 1. This raises the question of whether this kind of variables will affect the result of the statistics. However, it should be noted that, for the linear regression model, it is unnecessary to remove the variables that have low distribution for one of the values from the dataset (in the case of binary values). Also, a normal distribution (Gaussian distribution) test (West, 2004; Cover and Thomas, 2006; Lyon, 2014) for the variables that have continuous values is also unnecessary before executing the regression.

Figure 1. Distribution of the number of working years (*nyear*)

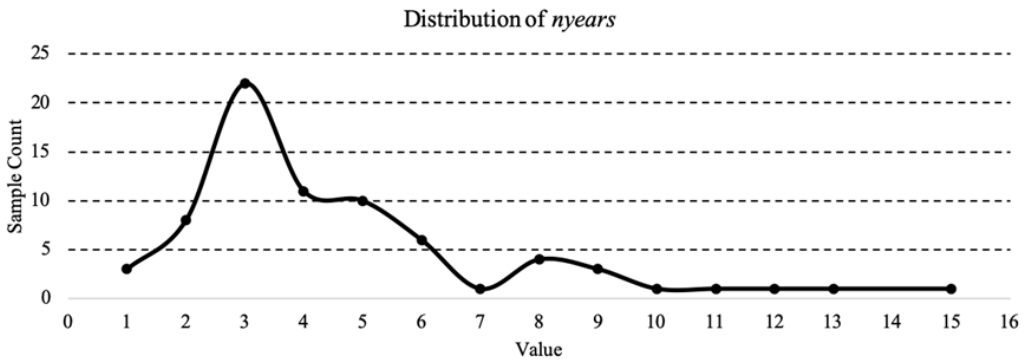


Figure 2. Distribution of the number of projects (*nprojects*)

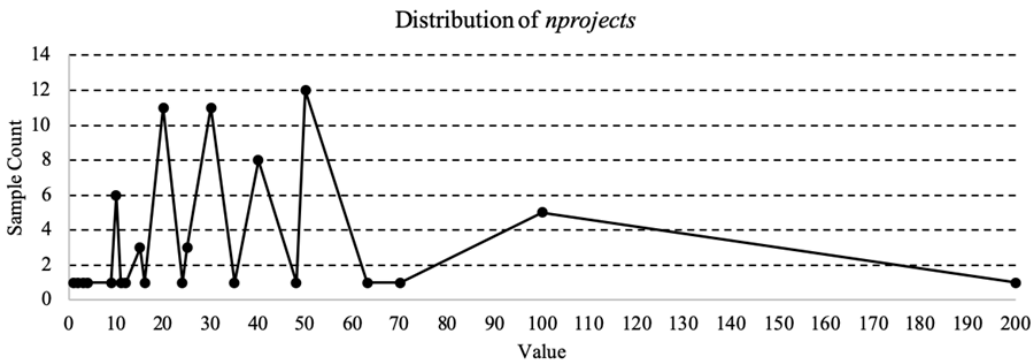


Table 1. Variable and distribution

No.	Meaning	Variable Name	Value	Distribution (1: 0 or Yes: No)
#1	Gender (male)	<i>male</i>	Binary	21: 52 (28.77%: 71.23%)
#2	Senior	<i>senior</i>	Binary	41: 32 (56.16%: 43.84%)
#3	Assistant	<i>assistant</i>	Binary	10: 63 (13.70%: 86.30%)
#4	Manager	<i>manager</i>	Binary	20: 53 (27.40%: 72.60%)
#5	Partner	<i>partner</i>	Binary	01: 72 (01.37%: 98.63%)
#6	Director	<i>director</i>	Binary	01: 72 (01.37%: 98.63%)
#7	Number of Working Years	<i>nyears</i>	Positive Integer	(See Figure 1 and 2 due to the continuous values)
#8	Number of Projects	<i>nprojects</i>	Positive Integer	
#9	ACCA	<i>ACCA</i>	Binary	40: 33 (54.79%: 45.21%)
#10	VACPA	<i>VACPA</i>	Binary	14: 59 (19.18%: 80.82%)
#11	CPA	<i>CPA</i>	Binary	09: 64 (12.33%: 87.67%)
#12	Bachelor	<i>bachelor</i>	Binary	01: 72 (01.37%: 98.63%)
#13	MBA	<i>MBA</i>	Binary	09: 64 (12.33%: 87.67%)

Note: The 2nd and 5th columns are described in italic font to indicate the math variables

3.2.2 Target Function

The assessment for the professional judgment consists of the following three target functions:

$$f_{11} = \text{proplan}, f_{12} = \text{profield}, f_{13} = \text{procon} \quad (2)$$

where *proplan*, *profield*, and *procon* denote the impact of professional judgment on the planning phase, the fieldwork phase, and the concluding and report phase of the auditing. Similarly, the assessment for ethics also consists of three target functions:

$$f_{21} = \text{ethplan}, f_{22} = \text{ethfield}, f_{23} = \text{ethcon} \quad (3)$$

where *ethplan*, *ethfield*, and *ethcon* denote the impact of ethics on the planning phase, the fieldwork phase, and the concluding and reporting phase of the auditing. The values of these impacts are 10-point Likert-scale numbers. The distribution of the target functions is given in Figure 3. Remark that we consider the target functions separately instead of integrating them by using the summation of the scores in all the phases (planning, fieldwork, and concluding and reporting phase) such as:

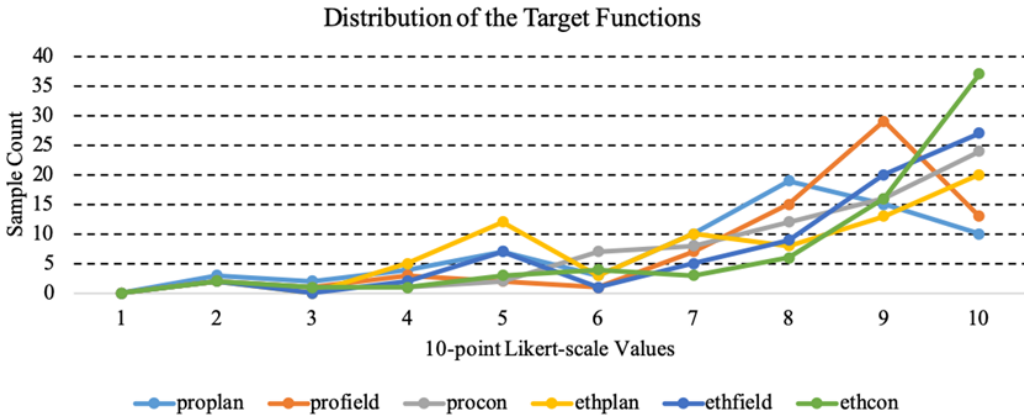
$$f_1 = f_{11} + f_{12} + f_{13} \text{ (for professional judgment)} \quad (4)$$

$$f_2 = f_{21} + f_{22} + f_{23} \text{ (for ethics)} \quad (5)$$

It can be explained with the following reasons:

- Each phase does not have the same weight of the impact. There should be different coefficients for $f_{11}, f_{12},$ and f_{13} when calculating f_1 , and different coefficients for $f_{21}, f_{22},$ and f_{23} when calculating

Figure 3. Distribution of the target functions



f_2 . The coefficients indicate the different impact levels of the phases. Therefore, simply summing the target function in each phase with the coefficient as 1 is inappropriate to measure the impact of all the phases.

- Measuring the impact of all the phases cannot provide more information than measuring the impact of each phase.

3.2.3 Determination of the Affecting Factors

After defining the model, we apply the linear regression and the t-test to measure the impact. The affecting factors are the ones that have the p -values ≤ 0.05 . We separate the affecting factors into the following levels:

- $0.01 < p \leq 0.05$: called *acceptable affecting factors* (the factor moderately affects the target function). This kind of factor is marked as (*) in the experiment result.
- $0.001 < p \leq 0.01$: called *nearly significant affecting factors* (the factor highly affects the target function). This kind of factor is marked as (**) in the experiment.
- $p \leq 0.001$: called *significant affecting factors* (the factor significantly affects the target function). This kind of factor is marked as (***) in the experiment result.

4. EXPERIMENT RESULTS

The experiment is run on a Macbook Pro with 2.8 GHz Intel core i7 of processor and 16 GB 2133 MHz LPDDR3 of memory. The program is written using Python 3.7.1 programming language⁷. The linear regression model is implemented using *scikit-learn* v0.21.3 library⁸. The t -test is performed using *statsmodels* v0.10.1 library⁹.

4.1 Result for Professional Judgment

The linear regression and t -test are applied to our defined model using three different target functions. The result is shown in Table 2. The 2nd column consists of thirteen variables that are mentioned in Table 1. The 3rd, 4th, and 5th columns are the results when f_{11} is used for the target function. The 6th, 7th, and 8th columns are the results when f_{12} is used for the target function. The last three columns are the results when f_{13} is used for the target function. The results consist of

Table 2. Experiment results for professional judgment

No.	Factor	Planning (f_{11})			Fieldwork (f_{12})			Concluding and Reporting (f_{13})		
		Coef.	<i>p</i> -Value	95%CI	Coef.	<i>p</i> -Value	95%CI	Coef.	<i>p</i> -Value	95%CI
	(Intercept)	5.8327	0.000	[3.282, 8.383]	6.6555	0.000	[4.216, 9.095]	6.4235	0.000	[3.890, 8.957]
1	<i>male</i>	0.3407	0.589	[-0.912, 1.594]	-0.0433	0.943	[-1.242, 1.155]	0.0306	0.961	[-1.214, 1.275]
2	<i>senior</i>	0.2102	0.784	[-1.316, 1.737]	0.6485	0.378	[-0.811, 2.108]	0.9455	0.217	[-0.571, 2.462]
3	<i>assistant</i>	0.4668	0.665	[-1.676, 2.609]	0.8225	0.425	[-1.226, 2.872]	0.6437	0.547	[-1.485, 2.772]
4	<i>manager</i>	0.6468	0.362	[-0.761, 2.054]	1.1232	0.100	[-0.223, 2.469]	1.2217	0.086	[-0.176, 2.620]
5	<i>partner</i>	4.4957	0.122	[-1.242, 10.233]	2.7356	0.323	[-2.751, 8.222]	3.1616	0.272	[-2.537, 8.861]
6	<i>director</i>	0.0132	0.995	[-4.540, 4.566]	1.3256	0.545	[-3.029, 5.680]	0.4509	0.843	[-4.072, 4.974]
7	<i>nyears</i>	-0.0023	0.990	[-0.365, 0.360]	0.0071	0.967	[-0.340, 0.354]	0.0840	0.642	[-0.276, 0.444]
8	<i>nprojects</i>	-0.0151	0.328	[-0.046, 0.016]	-0.0058	0.692	[-0.035, 0.023]	-0.0110	0.472	[-0.041, 0.019]
9	<i>ACCA</i>	1.3231	0.048 (*)	[0.012, 2.634]	0.8677	0.171	[-0.386, 2.121]	0.7624	0.246	[-0.539, 2.064]
10	<i>VACPA</i>	1.3827	0.077	[-0.154, 2.919]	0.7113	0.337	[-0.758, 2.181]	0.3228	0.674	[-1.203, 1.849]
11	<i>CPA</i>	2.8193	0.002 (**)	[1.102, 4.537]	1.2258	0.141	[-0.417, 2.868]	1.5440	0.075	[-0.162, 3.250]
12	<i>bachelor</i>	2.3776	0.292	[-2.097, 6.852]	1.0094	0.639	[-3.269, 5.288]	0.8981	0.687	[-3.546, 5.342]
13	<i>MBA</i>	1.6693	0.062	[-0.089, 3.427]	0.5571	0.510	[-1.124, 2.238]	0.7509	0.393	[-0.995, 2.497]

Note: (*) represents $0.01 < p \leq 0.05$, (**) represents $0.001 < p \leq 0.01$, and (***) represents $p \leq 0.001$.

the coefficients, *p*-values, and 95% confidence interval (CI). CI is an estimated range of values that may contain the true mean of the population. Most commonly, the confidence level is used as 95% (strictly speaking, if we were to take 100 different samples and compute a 95% CI for each sample, then approximately 95 of the 100 confidence intervals will contain the true mean value). Remember that, in the experiment result, (*) represents $0.01 < p \leq 0.05$, (**) represents $0.001 < p \leq 0.01$, and (***) represents $p \leq 0.001$.

The final factors that affect the target functions for each phase of the auditing process are given:

- **Planning Phase:** Two factors are found including:
 - **ACCA:** *Acceptable affecting factor* with $p = 0.048$ ($0.01 < p \leq 0.05$). The positive coefficient ($c = 1.3231$) indicates that the auditors who have the ACCA certificate tend to use their

professional judgment in the planning phase of the auditing process. (If the coefficient is negative, the factors will affect the target function in the opposite way. For example, $p = -0.048$ indicates that the auditors who do NOT have the ACCA certificate tend to use professional judgment in the planning phase).

- **CPA:** *Nearly significant affecting factor* with $p = 0.002$ ($0.001 < p \leq 0.01$). The positive coefficient ($c = 2.8193$) indicates that the auditors who have the CPA certificate tend to use professional judgment in the planning phase of the auditing process.
- **Fieldwork Phase:** There is no factor found.
- **Concluding and Reporting Phase:** There is no factor found.

4.2 Result for Ethics

Similar to the professional judgment, the linear regression and t -test are applied to evaluate the ethics (table 3) with three different target functions f_{21} , f_{22} , and f_{23} . The final factors affecting the target functions in each phase of the auditing process are given:

Table 3. Experiment result for ethics

No.	Factor	Planning (f_{21})			Fieldwork (f_{22})			Concluding and Reporting (f_{23})		
		Coef.	p -Value	95%CI	Coef.	p -Value	95%CI	Coef.	p -Value	95%CI
(Intercept)		5.8213	0.000	[3.092, 8.550]	6.4600	0.000	[3.766, 9.154]	7.5002	0.000	[4.961, 10.040]
1	<i>male</i>	0.6181	0.360	[-0.723, 1.959]	0.2575	0.699	[-1.066, 1.581]	-0.2329	0.710	[-1.481, 1.015]
2	<i>senior</i>	0.1045	0.899	[-1.529, 1.738]	0.9284	0.254	[-0.684, 2.541]	0.6769	0.377	[-0.843, 2.197]
3	<i>assistant</i>	0.3822	0.740	[-1.910, 2.675]	1.3070	0.253	[-0.956, 3.570]	-0.1645	0.878	[-2.298, 1.969]
4	<i>manager</i>	1.1210	0.142	[-0.385, 2.627]	0.9632	0.200	[-0.523, 2.450]	1.4690	0.040 (*)	[0.068, 2.870]
5	<i>partner</i>	2.9445	0.341	[-3.194, 9.083]	2.9216	0.339	[-3.138, 8.981]	5.2784	0.069	[-0.434, 10.991]
6	<i>director</i>	1.2690	0.604	[-3.602, 6.141]	0.3398	0.888	[-4.469, 5.149]	0.2404	0.916	[-4.293, 4.774]
8	<i>nyears</i>	0.0152	0.938	[-0.373, 0.403]	0.1811	0.348	[-0.202, 0.564]	0.0461	0.799	[-0.315, 0.407]
8	<i>nprojects</i>	-0.0023	0.889	[-0.035, 0.030]	-0.0113	0.488	[-0.044, 0.021]	-0.0170	0.270	[-0.047, 0.014]
9	<i>ACCA</i>	0.8997	0.204	[-0.503, 2.302]	0.4627	0.506	[-0.922, 1.847]	0.9702	0.142	[-0.335, 2.275]
10	<i>VACPA</i>	0.8472	0.307	[-0.797, 2.491]	-0.1020	0.900	[-1.725, 1.521]	0.1543	0.841	[-1.375, 1.684]
11	<i>CPA</i>	1.2555	0.177	[-0.582, 3.093]	0.5318	0.560	[-1.282, 2.346]	1.3078	0.131	[-0.402, 3.018]
12	<i>bachelor</i>	2.5253	0.296	[-2.262, 7.312]	1.3742	0.563	[-3.351, 6.100]	1.7653	0.431	[-2.689, 6.220]
13	<i>MBA</i>	2.1705	0.024 (*)	[0.290, 4.051]	0.4455	0.633	[-1.411, 2.302]	0.4442	0.614	[-1.306, 2.194]

Note: Remind that: (*) represents $0.01 < p \leq 0.05$, (**) represents $0.001 < p \leq 0.01$, and (***) represents $p \leq 0.001$.

- **Planning Phase:** Only one factor is found:
 - **MPA:** *Acceptable affecting factor* with $p = 0.024$ ($0.01 < p \leq 0.05$). The positive coefficient ($c = 2.1705$) indicates that the auditors who obtained an MBA degree tend to use ethics in the planning phase of the auditing process.
- **Fieldwork Phase:** There is no factor found.
- **Concluding and Reporting Phase:** Only one factor is found:
 - **Manager:** *Acceptable affecting factor* with $p = 0.040$ ($0.01 < p \leq 0.05$). The positive coefficient ($c = 1.4690$) indicates that the auditors who are managers tend to use ethics in the concluding and reporting phase of the auditing process.

5. DISCUSSION AND CONCLUSION

In this section, we discuss some ideas for future work and their challenges.

- **Survey Language:** First, the survey is currently applied to a set of participants who are the auditors working in Vietnam. If the survey can be extended to global participants, the model can obtain more objective results. The globalization here can be in terms of having different nationalities or can be in terms of working in different countries. The challenge of this idea is that we should analyze whether the survey should be designed in English as a global language or translated into different languages. If the latter is decided, how to translate the survey such that the structure, meanings, and correctness are preserved should be also carefully studied.
- **Other Features:** Second, some other promising features can be added to the survey. For the demographics, the features can include age, salary, the duration of time that the participants spent to finish the survey. For the work experience, the features can include whether or not the participants have work experience in other business, how many auditor colleagues that the participants are working with, how many times that the participants change the company, whether the participant's company organize the class of philosophy in which the participant is educated about the professional judgment and ethics in auditing.
- **Likert-scale Options for the Impacts:** Finally, there are ten answer options for the impact questions in each target function. We hypothesized that, instead of giving many answer options such as ten in the current survey, the respondents may be more focused if the number of answers is reduced to 5-point Likert-scale options such as: not at all, not much, sometimes, often, and always. However, how many points for the Likert-scale that the model can give the best fit should be analyzed.

CONTRIBUTION

To the best of our knowledge, we are the first to investigate the impact of the auditor's personal information on the professional judgment and ethics in each phase of the auditing process including the planning phase, the fieldwork phase, and the concluding and reporting phase. We designed a survey and applied it to 74 auditor participants. We analyzed the responses, applied a (multiple) linear regression model, and measure the factors using the t-test statistics. Our results reveal some interesting findings. First, the auditors who obtained the accounting certificate ACCA (Association of Chartered Certified Accountants ACCA) or CPA (Certified Public Accountant) tend to use their professional judgment in the planning phase. Especially, the latter (i.e., CPA) is a nearly significant factor affecting the decision making in the planning phase. Furthermore, the auditors who got an MBA

degree tend to use ethics in the planning phase. Surprisingly, only the auditors who are managers really use ethics in the decision making of the final concluding and reporting phase.

In this work, we have investigated an analysis on the impact of the professional judgment and ethics on the planning phase, the fieldwork phase, and the concluding and reporting phase of the decision making in an auditing process. We designed an online survey and distributed it to 74 participants who are working as auditors. The survey consists of questions related to demographics, work experience, and impact of professional judgment and ethics to decision making in auditing. We analyzed the responses and applied a linear regression model along with the t-test statistics. Our experimental result shows that the auditors who have ACCA or CPA auditing certificates tend to use their professional judgment in the planning phase, and the CPA certificates is a nearly significant factor affecting the professional judgment in the planning phase. For the ethics, the auditors who have MBA tend to use ethics in the planning phase. Only the auditors who are managers tend to use ethics in the concluding and reporting phase.

FUNDING INFORMATION

This research is funded by University of Economics Ho Chi Minh City, Vietnam (UEH). We are grateful to UEH for the funding of the research.

REFERENCES

- American Institute of Accountants. (1955). *A Case Study of the Extent of Audit Samples*. New York: AICPA.
- Bonner, S. E. (2008). *Judgment and Decision Making in Accounting*. Pearson/Prentice Hall.
- Bringselius, L. (2018). Efficiency, economy and effectiveness—But what about ethics? Supreme audit institutions at a critical juncture. *Public Money & Management*, 38(2), 105–110. doi:10.1080/09540962.2018.1407137
- Collins, L., & Collins, D. (2016). Professional judgement and decision-making in the planning process of high-level adventure sports coaching practice. *Journal of Adventure Education and Outdoor Learning*, 16(3), 256–268. doi:10.1080/14729679.2016.1162182
- Cover, T. M., & Thomas, J. A. (2006). *Elements of Information Theory*. John Wiley and Sons.
- Dhillon, P. S., Foster, D. P., Kakade, S. M., & Ungar, L. H. (2013). A risk comparison of ordinary least squares vs ridge regression. *Journal of Machine Learning Research*, 14(1), 1505–1511.
- Elbeltagi, I., & Agag, G. (2016). E-retailing ethics and its impact on customer satisfaction and repurchase intention. *Internet Research*, 26(3), 288–310. doi:10.1108/IntR-10-2014-0244
- Everett, J., & Tremblay, M. S. (2014). Ethics and internal audit: Moral will and moral skill in a heteronomous field. *Critical Perspectives on Accounting*, 25(3), 181–196. doi:10.1016/j.cpa.2013.10.002
- Freedman, D. A. (2009). *Statistical Models: Theory and Practice*. Cambridge University Press. doi:10.1017/CBO9780511815867
- Halim, H. A., Jaafar, H., Janudin, S. E., & Idris, P. S. (2018). Factors influencing professional judgment of auditors in Malaysia. *International Business Research*, 11(11), 119–127. doi:10.5539/ibr.v11n11p119
- Hart, S. D., Douglas, K. S., & Guy, L. S. (2016). The Structured Professional Judgement Approach to violence risk assessment: Origins, nature, and advances. *The Wiley handbook on the theories, assessment and treatment of sexual offending*, 643–666.
- Harter, W. L. (1974). The Method of Least Squares and Some Alternatives: Part I. *International Statistical Review/Revue Internationale de Statistique*, 42(2), 147–174.
- Helland, I. S., Sæbø, S., Almøy, T., & Rimal, R. (2018). Model and estimators for partial least squares regression. *Journal of Chemometrics*, 32(9), e3044. doi:10.1002/cem.3044
- Houghton, C. (2015). Young people's perspectives on participatory ethics: Agency, power and impact in domestic abuse research and policy-making. *Child Abuse Review*, 24(4), 235–248. doi:10.1002/car.2407
- IAASB. (2010). *ISA 200, Overall Objectives of the Independent Auditor and the Conduct of an Audit in Accordance with International Standards on Auditing*. International Federation of Accountants.
- International Auditing and Assurance Standards Board - IAASB. (2013). *Handbook of International Quality Control, Auditing, Review, Other Assurance, and Related Services Pronouncements*. International Federation of Accountants.
- Libby, R. (1981). *Accounting and Human Information Processing: Theory and Applications*. Prentice-Hall.
- Libby, R. (1983). *Determinants of Performance in Accounting Decisions*. Accounting Research Convocation. The University of Alabama Press.
- Libby, R. (1995). The Role of Knowledge and Memory in Audit Judgment. In R. Ashton & A. Ashton (Eds.), *Judgment and Decision Making Research in Accounting and Auditing* (pp. 176–206). doi:10.1017/CBO9780511720420.009
- Louwers, T. J., Ramsay, R. J., Sinason, D. H., Strawser, J. R., & Thibodeau, J. C. (2021). *Auditing & Assurance Services* (8th ed.). McGraw-Hill Education.
- Lyon, A. (2014). Why are normal distributions normal? *The British Journal for the Philosophy of Science*, 65(3), 621–649. doi:10.1093/bjps/axs046

- Martinov-Bennie, N., & Mladenovic, R. (2015). Investigation of the impact of an ethical framework and an integrated ethics education on accounting students' ethical sensitivity and judgment. *Journal of Business Ethics*, 127(1), 189–203. doi:10.1007/s10551-013-2007-5
- Nguyen, H. T. L. (2021). A conceptual framework for wisdom-based decision-making process in audit profession. *Library Hi Tech*. doi:10.1108/LHT-10-2020-0256
- Nguyen, L. (2017). *Doctoral dissertation in Conceptual framework of wisdom in auditing*. Japan Advanced Institute of Science and Technology - JAIST.
- Nguyen, L., & Kohda, Y. (2017a). Toward a Knowledge Management Framework for Auditing Processes. *International Journal of Knowledge and Systems Science*, 8(3), 45–67. doi:10.4018/IJKSS.2017070104
- Nguyen, L., & Kohda, Y. (2017b). Toward a model of wisdom determinants in the auditing profession. *Proceedings of Hawaii International Conference on System Sciences 50th (HICSS 50th)*. doi:10.24251/HICSS.2017.560
- Rencher, A. C., & Christensen, W. F. (2012). *Methods of Multivariate Analysis* (3rd ed.). John Wiley & Sons.
- Samsonova-Taddei, A., & Siddiqui, J. (2016). Regulation and the promotion of audit ethics: Analysis of the content of the EU's policy. *Journal of Business Ethics*, 139(1), 183–195. doi:10.1007/s10551-015-2629-x
- Sheffet, O. (2017). Differentially private ordinary least squares. *Proceedings of the 34th International Conference on Machine Learning*, 70, 3105–3114.
- Şişmanoğlu, E., & Arikboğa, D. (2018). The factors affecting using professional judgment in independent auditing: Evidences from Turkey. *Contemporary Research in Economics and Social Sciences*, 2(1), 141–188.
- Solomon, I., Shields, M., & Whittington, O. (1999). What do industry-specialist auditors know? *Journal of Accounting Research*, 37(1), 191–208. doi:10.2307/2491403
- Student, W. (1908). The Probable Error of a Mean. *Biometrika*, 6(1), 1–25. doi:10.2307/2331554
- Suryanto, T. (2017). Cultural Ethics and Consequences in Whistle-Blowing among Professional Accountants: An Empirical Analysis. *Journal of Applied Economic Sciences*, 6(52), 1725–1731.
- Taylor, B. J. (2017). Heuristics in professional judgement: A psycho-social rationality model. *British Journal of Social Work*, 47(4), 1043–1060. doi:10.1093/bjsw/bcw084
- Thao, T., Takahashi, M., Shigeta, N., Irvan, M., Nakata, T., & Yamaguchi, R. (2020a). Human Factors in Exhaustion and Stress of Japanese Nursery Teachers: Evidence from Regression Model on A Novel Dataset. *Proceedings of the 13th International Conference on Advances in Computer-Human Interactions (ACHI'20)*.
- Thao, T. P., Sawaya, Y., Nguyen-Son, H. Q., Yamada, A., Kubota, A., Van, S. T., & Yamaguchi, R. S. (2020b). Human Factors in Homograph Attack Recognition. *18th International Conference on Applied Cryptography and Network Security (ACNS'20)*. doi:10.1007/978-3-030-57878-7_20
- Thao, T. P., Sawaya, Y., Nguyen-Son, H. Q., Yamada, A., Kubota, A., Van Sang, T., & Yamaguchi, R. S. (2019). *Influences of Human Demographics, Brand Familiarity and Security Backgrounds on Homograph Recognition*. <https://arxiv.org/abs/1904.10595>
- Tuncay Zayer, L., & Coleman, C. A. (2015). Advertising professionals' perceptions of the impact of gender portrayals on men and women: A question of ethics? *Journal of Advertising*, 44(3), 1–12. doi:10.1080/00913367.2014.975878
- Weber, R. (1980). Some characteristics of the free recall of computer controls by EDP auditors. *Journal of Accounting Research*, 18(1), 214–241. doi:10.2307/2490399
- West, G. (2004). Better Approximations to Cumulative Normal Functions. *Wilmott Magazine*, 70–76.
- Yan, X., & Su, X. (2009). *Linear Regression Analysis: Theory and Computing*. World Scientific. doi:10.1142/6986

ENDNOTES

- ¹ Google Form: <https://www.google.com/forms/about/>
- ² Single-choice question: the participants can only choose one answer option.
- ³ Multiple-choice question: The participants can choose multiple answer options at the same time.
- ⁴ ACCA: Association of Chartered Certified Accountants
- ⁵ VACPA: Vietnam Association of Certified Public Accountants
- ⁶ CPA: Certified Public Accountant
- ⁷ Python 3.7.1: <https://www.python.org/downloads/release/python-371/>
- ⁸ Scikit-learn: <https://scikit-learn.org>
- ⁹ Statsmodels: <https://www.statsmodels.org/>

Hoang To Loan Nguyen is a lecturer of Auditing Department, School of Accounting, University of Economics Ho Chi Minh City, Ho Chi Minh City, Vietnam. She did bachelor of arts (BA) in international business (2008). After that, she worked in EY Limited Company for around five years. Then she got master of science in knowledge management (2014) and doctor of philosophy (PhD) in knowledge management (2017) from Japan Advanced Institute of Science and Technology (JAIST), Japan. Her current areas of research includes audit judgment and decision-making, other research in accounting and auditing, accounting education and forensic accounting. Hoang To Loan Nguyen can be contacted at: loannht@ueh.edu.vn.