

# THE IMPACT OF ARTIFICIAL INTELLIGENCE ON CORPORATE CONTROL

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## Abstract

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This paper investigates the relationship between artificial intelligence (AI) and corporate control in the United Arab Emirates (UAE) emerging market. An exploratory study was conducted to derive the research questions. The nonprobability purposive sampling technique was implemented to select 10 highly experienced interviewees. In-depth primary data was collected through semi-structured interviews during 2019. Qualitative content analysis was used to answer the research questions. The results show a positive impact of AI on firm productivity and the auditing process, but uncertain influence on accounting information systems. More specifically, AI intervention increases firm productivity, creates new jobs and speeds up work processes. However, current AI technology is less likely to redefine auditing roles and still insufficient for developing accounting information systems. Human integration with AI systems will lead to more efficient results. This paper increases our understanding of how AI techniques can improve corporate control practices and the importance of selecting appropriate accounting professionals to decrease AI operation risks.

**Keywords:** Artificial Intelligence, Firm Performance, Auditing, Accounting Information Systems, UAE

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## 1. INTRODUCTION

In the past few years, organizations have been directed towards the adoption of AI in their activities, especially in accounting and auditing fields. Although the adoption of AI in firms may increase the efficiency in organizations, they must be careful with monitoring the costs and updates required for intelligent systems to avoid any risk and uncertainty (Gotthardt et al., 2019). However, the current AI adoption process seems to vary

across countries and even between companies in the same country (Gotthardt et al., 2019; Nickerson, 2019). This raises some doubts about the usefulness of this technology and allows companies to have concerns about whether adopting AI is worth it or not (Nickerson, 2019). Thus, it can be argued that the existence of AI itself may change the workload of accountants and auditors and increase their efficiency and effectiveness (Wilson & Daugherty, 2018). More studies, therefore, required to

investigate what is the correct way to start AI adoption in firms.

Several previous studies show the implementation of AI in firms has increased in the last few years for some reasons. For example, combining AI in accounting will minimize errors and mistakes, increase productivity (Jesuthasan, 2018), change the way people work in every industry (Jariwala, 2015), reduce problems of accounting databases (Pannu, 2015), and change clients expectations (Moffitt, Rozario, & Vasarhelyi, 2018). Furthermore, previous studies found that AI in auditing can motivate automation and change the auditing approach (Moffitt et al., 2018). However, AI has many limitations that cannot be forgiven. For example, AI can help with routine and repeated jobs in accounting but not with unique and new data (Nickerson, 2019). This implies that AI is still at an early stage of development and their associated costs and benefits are not clear for many organizations. Therefore, the main purpose of this study is to investigate the impact of AI on corporate control in the UAE. Specifically, this study attempts to answer the following questions: 1) What is the relationship between AI and firm productivity, 2) What is the impact of AI on the auditing process, 3) What is the influence AI and the accounting information systems. This study adds to the existing literature in two ways. First, it highlights the influence of AI on new areas such as firm productivity, auditing processes, and accounting information systems in an emerging market such as the UAE. Second, this study provides useful guidelines for accounting professionals and corporate managers on AI benefits and limitations in order to improve corporate control in the public and private sectors.

Empirical results in this paper show evidence of the impact of AI in enhancing firm productivity and auditing process. However, interviewees show that current AI technology has less impact on auditing roles and accounting information systems. The remainder of this paper is as follows: Section 2 presents the literature review. Section 3 has the methodology and data collection. Section 4 presents results and discussions. Finally, Section 5 concludes with a summary and recommendations for future studies.

## 2. LITERATURE REVIEW

The reasons behind introducing AI in business activities differ from one firm to another. Some firms use AI in process automation, while others have AI to optimize firm resources (Marr, 2019). In accounting, many auditing firms made significant investments in the AI industry (Zhou, 2017). For example, Ernest and Young (EY) and Deloitte both use AI for document and contract review and EY also uses AI in order to detect any fraud and fake transactions (*ibid*). This study uses the Human-Technology Collaboration Theory (Bauer, Wollherr, & Buss, 2008) to explain the results. This theory states that when humans and technology work together we can get better outcomes (Wilson & Daugherty, 2018). Nevertheless, previous empirical literature shows mixed results on the relationship between AI and corporate control. There are three main themes in previous literature which are:

the impact of AI on productivity, auditing process, and accounting information systems as follows.

### 2.1. Impact of AI on firm productivity

There is an ongoing debate between scholars on how the existence of AI in accounting affects firm productivity. Some studies highlight that AI will improve the quality of tasks done by accountants (Lin & Hazelbaker, 2019), create better insights (Nickerson (2019), increase their productivity by performing other high-level tasks (Jariwala, 2015), and create new jobs (Greenman, 2017). In contrast, a certain study done by the University of Oxford finds out that 95% of accountants are facing job redundancy due to the development of new machine technology (ICAEW, 2016). Even though it is true that AI may reduce demand for some professions but also, there is a good chance that this new technology will create new jobs in the market (ICAEW, 2016). Likewise, Greenman (2017) sees that it is normal to have changes in the job description of accountants over time. Thus, accountants can use AI technology and focus on higher-level work to achieve business goals (Lin & Hazelbaker, 2019). A report done by the Association of Chartered Certified Accountants (ACCA) supports this reasoning by suggesting that AI will allow accountants to shift from traditional tasks such as bookkeeping and recording transaction to focus on consultation, advisory and growth plan services (Jariwala, 2015).

Nevertheless, some scholars argue that at the current time the existing AI systems cannot provide very high practical and accurate outcomes (Luo, Meng, & Cai, 2018). Now machines can handle only routine jobs away from any uniqueness (ICAEW, 2018). The jobs that are taken from accountants are the non-sophisticated jobs that machines can perform easily (Lin & Hazelbaker, 2019). For example, audit firms now use robots for counting inventories, inspect fixed assets, handling bank audit confirmation, and reading contracts and documents. They argue that robots can do these basic jobs easier and faster than accountants who can save their time and focus on higher-level tasks (*ibid*). Greenman (2017) argues that humans deserve to use their brains in more advanced tasks rather than bookkeeping and transaction tasks. A global survey done on 3,000 executives found out that 79% of the respondents consider that AI will actually increase productivity (Ransbotham, Kiron, Gerbert, & Reeves, 2017). AI will allow human capital to use their time and skills more effectively to improve productivity (Jariwala, 2015). Accountants will shift from providing business information to focus on enhancing business performance and avoid less redundant job (Lin & Hazelbaker, 2019). Therefore, this study tries to answer the following question:

1) *What is the relationship between AI and firm productivity in the UAE emerging market?*

### 2.2. Applying AI in auditing processes

AI in the auditing processes is a set of technologies supplementing and changing the audit procedures (Issa, Sun, & Vasarhelyi, 2016). Some studies highlight that AI in auditing has been gradually evolving to motivate automation and change auditing approach (Moffitt et al., 2018). As the

emergence of analytics will change the time scope (more proactive than reactive), efficiency, cost and benefit of the auditing process (Fullerton, 2016) and improve auditing process (Issa et al., 2016; Li & Zheng, 2018; Nickerson, 2019; Ukpong, Udoh, & Essien, 2019). For example, Issa et al. (2016) argue that AI can help automate the auditing process and change it into high efficiency and highly effective audit line-production procedure. Rather than focusing on the restricted information provided by financial statements, auditors will be able to take advantage of textual data from social networks, video recordings, captured imagery, sensor data (e.g., Global Positioning System GPS locational data and Radio Frequency Identification RFID data), and merge the extracted characteristic with accounting and financial information (Moffitt et al., 2018). In addition, the functions of deep learning permit auditors to automate a number of tasks such as reviewing source documents (e.g., bank check, deposit slip, sales invoice), processing paperwork, analysing conference calls, emails, press release, news, and extract metadata from them, all of which could be further supporting evidence used to supplement traditional financial attributes (Issa et al., 2016). Raphael (2015) states “with the effective implementation of cognitive technologies, the audit process will become smarter, more insightful, and more efficient. This is the future of the audit career, and the users of financial statements deserve it”. Therefore, this study attempts to investigate the following question:

2) *What is the impact of AI on the auditing process in the UAE emerging market?*

### 2.3. Impact of AI on accounting information systems

Accounting information systems are databases for storing, processing and interpreting results (Tarmidi, Rozalan, Rasli, Roni, & Alizan, 2018). Previous studies show that the use of AI reduces the problems of accounting databases (Pannu, 2015), improve accounting information systems and decision making (Tarmidi et al., 2018). Integrating intelligent systems with accounting databases can help in the examination of large volumes of data with or without the direct participation of the decision-maker (*ibid*). The intelligent systems can resolve data and assist users to understand transactions, store and recover knowledge in natural language (Pannu, 2015). Such as the AI document-reviewing operation, developed by Deloitte, which automates the process of reviewing and extracting relevant information from various documents (Lin & Hazelbaker, 2019). Moreover, Mirzaey, Jamshidi, and Hojatpour (2017) argue that AI design allows accounting to process high volumes of data and experts can use the AI databases for consultancy to reduce costs. Li and Zheng (2018) find that AI has improved work efficiency such as registration of accounting books, the formation of statements that have required many resources. He argues that AI allows accounting personnel to focus on data entry, and the computer will do the rest of the job (*ibid*). Therefore, this study challenges to investigate the following question:

3) *What is the influence of AI on the accounting information systems in the UAE emerging market?*

## 3. METHODOLOGY

### 3.1. Research methods

This study uses the qualitative research methodology to answer the research questions (Burney & Saleem, 2008; Patton, 2005; Saunders, Lewis, & Thornhill, 2019). That is, it is used to gain intensive feedback on the respondents' opinions of AI operational processes and corporate control. It provides in-depth interpretations of the ways respondents understand, act and manage their day-to-day situations in particular settings (Saunders et al., 2019). This methodology is implemented by using semi-structured interviews to collect qualitative data through open questions (Appendix A). Again, this method is appropriate for this study because it provides in-depth information directly from respondents. The qualitative method depends on language, concepts, and words rather than numbers to represent evidence from research (Curtis & Drennan, 2013; Fain, 2017). In contrast, survey instruments can be somehow inaccurate depending on the sample size (Saunders et al., 2019).

### 3.2. Data collection

For the purpose of this study, qualitative data is collected using semi-structured interviews. The main advantage of interviews is the existence of direct contact with respondents which allows more understanding of responses (Saunders et al., 2019). However, there is a risk of respondents not answering interview questions correctly or refusing to answer the questions, which will result into wrong conclusions (*ibid*). In this study, interview questions are adopted from previous interviews and survey questions (Almarzooqi, 2019) and modified to meet the study objectives. Thus, the interview questions are divided into three different sections. Section 1 investigates the relationship between AI and firm productivity. Section 2 looks into AI and auditing processes. While Section 3 focuses on AI and accounting information systems. Details on the interview questions are found in Appendix A.

This study implements the non-probability purposive sampling technique. Purposive sampling is widely used in qualitative research for the identification and selection of knowledgeable respondents in the phenomenon of interest (Saunders et al., 2019). That is, it is used in order to select respondents that are well experienced and are related to the idea and objectives of the research (Palinkas et al., 2015). The number of sample interviewees depends on several criteria such as interview structure and content (Guest, Bunce, & Johnson, 2006) and the availability of resources (Seidman, 2006). In this study, the sample size satisfies the research criteria which focuses on obtaining intensive information from highly experienced respondents in different business sectors given the limited research resources and time availability. The 10 interviewees selected in this study are a mix of accountants and auditors from different organizations which include: high education organization, Chamber of Commerce, state-audit organization and three international

audit firms in the UAE. The sample chosen come from different entities and firms in order to have results that are free from any bias. Again, interviewees are chosen due to their knowledge in this field and their rich background information in both AI and accounting. The interviewees' demographics include four accountants (40%), five auditors (50%), and one vice president for finance (10%). Male and female respondents were (60%) and (40%), respectively.

Interviews were conducted via face-to-face office visits or phone calls during October and November 2019. Each interview took approximately 30 to 40 minutes. Detailed written notes were taken during each interview and in some cases, voice recording was used subject to respondents' approval (O'Leary, 2010). Then, the manual content analysis was used to analyse the data gathered from the interviews. The content analysis is a widely used method in social research and in related disciplines and professions (Drisko & Maschi, 2015). It is original in communication research and is potentially one of the most significant analysis techniques in the social sciences (Hsieh & Shannon, 2005). The content analysis seeks to analyze data within a specific condition in view of the meanings of someone or a group or a culture attached to them (Drisko & Maschi, 2015). One of the main advantages of content analysis is the step by step analysis of the material, following rules of procedure, into content analytical units (Hsieh & Shannon, 2005).

## 4. RESULTS AND DISCUSSION

### 4.1. AI and firm productivity

The empirical results using content analysis of interviewees' statements showed that (80%) of interviewees agree that adopting AI will impact the time needed for a process. That is, accountants or auditors will need less time to get done with tasks due to the automation of tasks. In addition, integration of AI will help in structuring formless data which takes a huge amount of time to fix. For example, the interviewee (No. 1) pointed out "We will be able to do more tasks in less amount of time". This means that AI implementation will speed up the work process consistent with the previous studies such as Lin and Hazelbaker (2019). Other interviewees highlighted that tasks getting done in a faster matter will allow a reduction in costs. As one interviewee (No. 2) said, "It will add value to the firm performance. It will contribute to cutting costs an increasing outcome".

Furthermore, other results show that (70%) of interviewees highlight that automation of tasks will cause a change to the resource of human capital after the adoption of AI. The speedup of processes will result in reducing the workload of employees. First, AI will allow accountants to focus on tasks that cannot be automated. Second, it will allow the human energy to be shifted to higher-level tasks with more value. For example, the interviewee (No. 6) clearly stated, "It will let their employees save time and be able to look at other sections or duties". This means that the adoption of AI will allow employees to save their energy to perform adding value tasks rather than time-consuming tasks. This shifting of

human capital will add value to firms and increase their performance consistent with previous literature such as Jariwala (2015). Therefore, this result implies that AI has positive relationship with firm productivity in the UAE emerging market.

### 4.2. AI and employment

The majority of interviewees (90%) documented that AI has several consequences on employment such as the need for new skills, professional accountants and encourage the employees to increase their intelligence. They highlighted that AI will create new jobs in the market that will need new skills and AI will not replace employees. For example, the interviewee (No. 10) pointed out "AI cannot replace us as professionals." As AI will not be able to stand alone or work alone, human and technology collaboration is needed. They added that for this collaboration to take place society should learn to change with the needs of technology. As one interviewee (No. 3) clearly stated "Understanding that new skills are going to be required. Computers will be used for ordinary jobs while humans for the extraordinary jobs". This is consistent with previous studies such as Greenman (2017) who argued that AI will allow humans to use their brains in higher advanced tasks rather than bookkeeping and transaction recording tasks that can be easily automated.

### 4.3. AI and auditing processes

#### 4.3.1. AI and auditing processes efficiency

The analysis results indicate that all interviewees (100%) indicated that the use of AI will increase the efficiency and effectiveness of the auditing process in the UAE. That is, the efficiency and effectiveness of work will lead to a higher quality of data. For example, the interviewee (No. 2) stated "Adding more value within the auditing process. This will result in providing and creating better and higher quality for the audit data". This is consistent with previous studies such as Lin and Hazelbaker (2019). Therefore, this outcome shows that AI has favorable impact on auditing process in the UAE emerging market.

#### 4.3.2. AI prerequisites

The analysis results show that there are two main steps to consider before the adoption of AI in auditing processes in the UAE emerging market. First, the majority of interviewees (70%) focus on planning and organizing how AI will satisfy the needs of the auditor and the client. Second, interviewees (50%) pointed out that costs and benefits should be considered before AI adoption. For example, the interviewee (No. 9) mentioned "It is always about the costs actually and whether these adoptions are worth it or not". Third, certain interviewees highlighted AI challenges as an important issue. Interviewee (No. 6) suggested "AI challenges such as losses of financial assets and losses of data".

### 4.3.3. AI and auditing roles

There is debate among interviewees on the influence of AI on auditing roles in practice. The analysis results show that only (50%) of interviewees documented that the adoption of AI in some cases can redefine auditing roles in private companies. As the interviewee (No. 7) clearly stated “It will make it easier to detect any errors, mistakes, and unconformities. It will give auditors an easier procedure or path to follow”. While the other (50%) of interviewees disagree on this issue. For example, the interviewee (No. 1) clearly stated “AI will not redefine roles but it will improve and enhance the efficiency and productivity of the existing roles”. This is consistent with previous studies such as Issa et al. (2016).

### 4.4. AI and accounting information systems

The analysis results show only (50%) of interviewees agree that the adoption of AI has enhanced and improved the accounting information systems. Some interviewees highlighted that AI will help in combining and analysing all accounting information needed in one platform to assist in preparing financial statements. In addition, they suggested that AI can save processing time and rebalance the accounts in some situations. As the interviewee (No. 3) highlighted that “I think we will see improvement in things like scanning, digitalization, and electronic invoicing, so we have input part of it”. This implies that input data will be more transparent, clean, and highly structured.

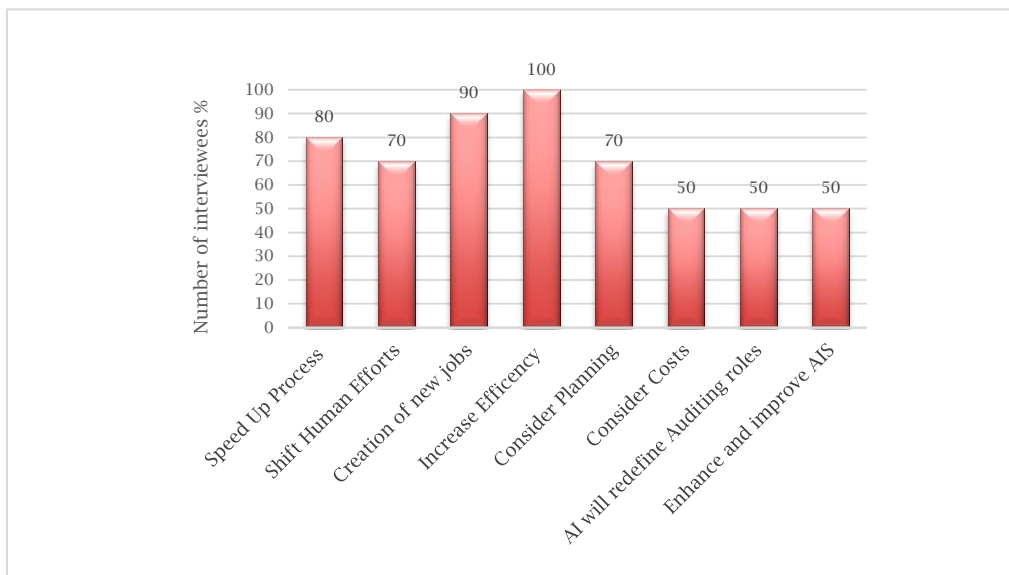
Moreover, the interviewee (No. 5) added a new point concerning the speed of processing. He mentioned that “AI allows accountants to access the data in a faster way from the database. Because it does not check it manually like how we do it. It does it smartly and intelligently and in a rapid step”. This implies that data will be automated instead of manual inputs, and users can select data more accessible and faster. Interviewee (No. 2) stated “AI should implement internal control systems to help poor corporate governance; cost-benefit analysis for developing, designing, implementing and

maintaining effective internal control systems”. This comment suggests linking AI, internal control systems and improvements in the internal scope of accounting information systems. This is consistent with previous studies such as Li and Zheng (2018) who stated that AI has improved work efficiency. For example, Enterprise Resource Planning (ERP) systems will continue to remove the risk of inaccuracy, mistakes and inconsistent data.

The analysis results indicated that (60%) of interviewees pointed out that existing AI technology is not sufficient for developing accounting information systems needed in the future. They argued that AI would need updates and improvements. It is true that current technology will expand and get more prominent in the future. However, the AI level of intelligence will not reach the level of human minds. As the interviewee (No. 5) mentioned, “AI tells me I don’t have enough budget, but does it guide me what to do next? An accountant is needed to tell me the rest. So, AI will definitely not be sufficient”. This implies that existing AI systems cannot reach the complexity of human minds and human integration with AI systems will lead to results that are more efficient. On the other hand, (40%) of the interviewees pointed out that existing AI technology is sufficient for developing accounting information systems in the future. As interviewee (No. 2) highlighted “Current AI can help and assist in producing the required reports for all stakeholders internally and external”. Therefore, this feedback indicates uncertain influence of AI on accounting information systems in the UAE emerging market.

The overall analysis results in Figure 1 indicate that interviewees agreed that AI would increase the efficiency and effectiveness of auditor work, which will lead to higher quality of data (100%). AI will create new jobs in the market and remove boring jobs (90%). AI adoption will speed up the accounting process (80%). However, there are disagreements among interviewees on issues such as considering AI costs before adoption (50%), AI will redefine the auditing roles by creating easier procedures, and AI will enhance speed and save time processing in accounting information systems (50%).

**Figure 1.** Interviewees responses on the impact of Artificial Intelligence and Factors Affecting Firm Productivity, Auditing Process, and Accounting Information Systems (AIS)



## 5. CONCLUSION

This paper examines the impact of AI adoption on corporate control in the UAE emerging market. The results show that there are positive relationships between AI, productivity, and auditing process, but uncertain influence on accounting information systems. Interviewees reported that the adoption of AI increases work efficiency which allows better decisions. AI also reduces the time needed to perform accounting tasks, create new jobs and allow employees to focus on a higher level and more important tasks. Moreover, AI has improved the accounting information systems to some extent. However, interviewees highlighted that current AI technology is less likely to redefine auditing roles and is not enough to develop accounting

information systems in the future. The practical implications of these results are important for both accounting professionals and corporate managers. Managers in the private and public sectors should consider the importance of AI to improve the speed and quality of work. However, they need to plan and organize AI adoption to avoid unsatisfactory results. Furthermore, managers should carefully select accounting professionals who are able to integrate with these AI systems in order to improve firm performance; and decrease the threat of misusing AI systems. Limitations in this study include the small sample size, absence of observations and document analysis given the restricted resources available. Future studies should investigate the AI implementation costs and barriers to develop accounting information systems.

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**APPENDIX A**

Interview questions

<i>Section 1: Productivity</i>	
1	What are the potential impacts of adopting AI on the productivity of the firm in the UAE? Why?
2	If you could design a new AI-based technology that would enhance and improve your firm performance, what will be its purpose?
3	What are the potential impact of AI on employment in the UAE? Why?
4	What are the most important determinates of AI adoption in the UAE? Why?
<i>Section 2: Auditing</i>	
5	What is the impact of AI on auditing process in the UAE? Why?
6	What are the most important steps private companies should consider when adopting AI in auditing process in the UAE? Why?
7	How will the adoption of AI redefine auditing roles in private companies in the UAE? Why?
8	In which ways can AI improve the efficiency and effectiveness of Auditing in the UAE? Why?
<i>Section 3: Accounting information systems</i>	
9	How does having AI impact on accounting information systems in the UAE? Why?
10	What AI systems should be implemented to improve accounting information systems in the UAE? Why?
11	Do you think the existing AI technology are sufficient for developing accounting information system that will be needed in future in the UAE? Why?