



RESEARCH ARTICLE

REVISED Data analytics competency and religiosity influence on external auditors' performance in Malaysia [version 2; peer review: 1 approved, 2 approved with reservations]

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Abstract

Background - Data analytics can support the external auditors' judgements. However, little is known about the external auditors' data analytics competency. Likewise, role of religiosity in enhancing the external auditors' performance is also inadequately investigated. This study examined: 1) the effects of data analytics competency on the external auditors' performance, and 2) the moderating effects of religiosity on data analytics competency and external auditors' performance relationship.

Methods - Survey was conducted on 201 external auditors. Data analytics competency dimensions, namely, personal capabilities, professional expertise, technical skills, technologies and tools expertise were examined. Religiosity was measured by level and dimension (faith, virtue and optional).

Results - Data analytics competency (personal capabilities) has a significant positive effect on the Muslim external auditors' performance, whereas data analytics competency (technologies and tools expertise) has a significant positive affect on the non-Muslim external auditors' performance. Level of religiosity has significant moderating effect on the relationship between data analytics competency (technologies and tools expertise) and Muslim external auditors' performance. Nonetheless, level of religiosity does not moderate the relationship between data analytics competency and the performance of non-Muslim external auditors. Religiosity (virtue) has significant moderating effect on the relationship between data analytics competency (personal capabilities) and Muslim external auditors' performance. Meanwhile, religiosity (faith) has a significant moderating effect on the relationship between data analytics competency (technologies and tools expertise) and non-Muslim external auditors' performance.

Conclusion - This study demonstrates that data analytics competency and religiosity can influence the external auditors' performance.

Open Peer Review

Approval Status

	1	2	3
version 2 (revision) 14 Feb 2022	 view		
version 1 09 Nov 2021	 view	 view	 view

1. **Prem Lal Joshi**, ICSSR, Mumbai, India
2. **Khalid Al-Adeem** , King Saud University, Riyadh, Saudi Arabia
3. **Amal Hayati Ahmad Khair**, De Montfort University, Leicester, UK

Any reports and responses or comments on the article can be found at the end of the article.

Keywords

Data analytics, competency, religiosity, external auditors, performance, Malaysia, Muslim, non-Muslim



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REVISED Amendments from Version 1

Reviewer 1 suggested the authors to provide justifications for the differences in findings between Muslim external auditors and non-Muslim external auditors. The revised version provided the justification (in the discussion section) that one possible reason might be due to the level of support provided by the auditing firms. Hence, further research is needed to understand other possible factors affecting the DAC and subsequently the EAP. In addition, Reviewer 1 commented whether the findings can be generalized to other environments. In the discussion section, the revised version stated that the study provided an initial investigation into the effects of religiosity on EAP. Future research might want to incorporate other contributing factors affecting EAP such as organizational culture as to understand the effects of various factors affecting performance in other environment or setting.

Reviewer 2 and 3 commented on the hypotheses development. A revision was made to improve the clarity of this section including of adding past studies on the potential moderating role of religiosity. Clearer explanation was made at the religiosity section as recommended by Reviewer 3. On the suggestion of Reviewer 2, to run SEM, the revised version retained the existing data analysis because the current software used in the study was able to analyse the current data and achieve the objectives of the study.

Any further responses from the reviewers can be found at the end of the article

Introduction

In this Fourth Industrial Revolution era, external auditors (EAs) are expected to acquire data analytics competency (DAC) because it can strengthen audit quality (e.g. ICAEW, 2016; Goh, 2017). However, evidence regarding the DAC of EAs and its impact on the external auditors' performance (EAP) is limited (Yeo & Carter, 2017). Furthermore, literature suggests religiosity influences individual's behaviour which includes commitment to work and ethics (e.g. Van Buren, Syed & Mir, 2020). Nonetheless, little is known about the role of religiosity in enhancing the EAP in the context of DAC. Thus, this study aims: (1) to investigate the influence of DAC on the EAP, and (2) to examine the moderating effect of religiosity on the relationship between DAC and the EAP.

Competence performance theory and hypotheses

This study adopts Competence Performance Theory (CPT) by Korossy (1999). CPT establishes a connection between competency (e.g. skills and abilities) and performance level. This theory aids in the prediction of performance outcomes and provides an explanation for performance discrepancies. Applying CPT to this study, perceived DAC (in terms of personal capabilities, professional expertise, technical skills, and technologies and tools expertise) help to predict the performance of the external auditors. Subsequently the theory explains that the discrepancies in the external auditors' performance could be contributed by their level of DAC. That is low in certain DAC denotes why the external auditor was not able to perform (in this study making correct judgment). Thus, this study hypothesises:

- H1a:** DAC (personal capabilities) has positive effects on the Muslim/non-Muslim-EAP.
- H1b:** DAC (professional expertise) has positive effects on the Muslim/non-Muslim-EAP.
- H1c:** DAC (technical skills) has positive effects on the Muslim/non-Muslim-EAP.
- H1d:** DAC (technologies and tools expertise) has positive effects on the Muslim/non-Muslim-EAP.

An individual conduct will be influenced by his or her religious belief in a variety of ways. Ali, Baluch and Mohamed Udin (2015) proposed a moderating role of religiosity on the relationship between technology readiness and diffusion of electronic commerce. In addition, Robbie and Novianti (2020) found that religiosity moderates the relationship between organizational commitment and employee performance. Bestyasamala (2018), on the other hand, offered mixed results on the moderating role of religiosity between two constructs (emotional intelligence and Religiosity Organizational Citizenship Behavior) and workers' performance. In the context of this study, it is predicted that religiosity commitment of the EAs will influence their behavior in performing the audit. This suggests that religiosity may influence the consistency of behaviour exhibited by the EAs. It is predicted that high DAC and level of religiosity will enhance the EAP. Therefore, this study further hypothesizes:

- H2a-b:** Religiosity (level/dimension) moderates the relationship between DAC (personal capabilities) and the Muslim/non-Muslim-EAP.
- H3a-b:** Religiosity (level/dimension) moderates the relationship between DAC (professional expertise) and the Muslim/non-Muslim-EAP.
- H4a-b:** Religiosity (level/dimension) moderates the relationship between DAC (technical skills) and the Muslim/non-Muslim-EAP.

H5a-b: Religiosity (level/dimension) moderates the relationship between DAC (technologies and tools expertise) and the Muslim/non-Muslim-EAP.

Methods

Research design and sample

Survey questionnaires (Underlying data) (Jaffar et al., 2021) were distributed among final year accounting students at one private university in Malaysia. There were 201 students and all of them participated in the survey. These students had undergone a six-month auditing internship program thus deemed suitable to be used as proxies for EAs. This approach is similar with Ashton and Kramer (1980) who also used students as surrogates for auditors.

DAC was measured by analysing: personal capabilities, professional expertise, technical skills, and technologies and tools expertise as proposed by Strengell's (2017) (Underlying data) (Jaffar et al., 2021). Religiosity (beliefs and practices) was adapted from Mahdzan, Zainudin, Che Hashim and Sulaiman's (2017). EAP was measured using Asare and Cianci's (2009) technique, where respondents were given a hypothetical inventory audit case and asked to indicate the likelihood of recommending the inventory to be written off. A pilot test with 50 students revealed that the questionnaire needed no changes. Finally, the questionnaires were sent to the actual respondents.

Models of the study

Models of this study were as follows:

Model 1:

$$\text{Perf} = \beta_0 + \beta_1\text{Personal} + \beta_2\text{Professional} + \beta_3\text{Technical} + \beta_4\text{Tools} + e$$

Model 2:

$$\text{Perf} = \beta_0 + \beta_1\text{Personal} + \beta_2\text{Professional} + \beta_3\text{Technical} + \beta_4\text{Tools} + \beta_5\text{Personal*ReliLevel} + \beta_6\text{Professional*ReliLevel} + \beta_7\text{Technical*ReliLevel} + \beta_8\text{Tools*ReliLevel} + e$$

Model 3:

$$\text{Perf} = \beta_0 + \beta_1\text{Personal} + \beta_2\text{Professional} + \beta_3\text{Technical} + \beta_4\text{Tools} + \beta_5\text{Personal*Faith} + \beta_6\text{Professional*Faith} + \beta_7\text{Technical*Faith} + \beta_8\text{Tools*Faith} + \beta_9\text{Personal*Virtue} + \beta_{10}\text{Professional*Virtue} + \beta_{11}\text{Technical*Virtue} + \beta_{12}\text{Tools*Virtue} + \beta_{13}\text{Personal*Optional} + \beta_{14}\text{Professional*Optional} + \beta_{15}\text{Technical*Optional} + \beta_{16}\text{Tools*Optional} + e$$

Model 1 depicts the relationship between DAC and EAP. Level of religiosity (Model 2) and religiosity dimensions (Model 3) were included to test the moderating effects of religiosity on the relationship between DAC and EAP.

Results and statistical analysis

This study used SPSS Version 26 to analyse the data. Specifically, linear regression was applied to test all the three models of the study. The linear regression was performed separately for Muslim and non-Muslim EAs. Exploratory factor analysis (EFA) was performed to identify the latent constructs of religiosity, and means analysis was used to determine the level of religiosity. Details of the data analysis were presented in the following sections.

DAC and performance

For Muslim EAs, the result exhibited a close to moderate level of R square (42.2%) which signified that variation of the Muslim-EAP was almost moderately explained by their DAC. DAC statistically ($p=0.000$) predicted the Muslim-EAP. Coefficient results showed that DAC (personal capabilities) was the main predictor ($p = 0.000$) of the Muslim-EAP. Results of Model 1 for non-Muslim EAs revealed a weak level of R square (1.9%) denoting that the variation of the non-Muslim-EAP was weakly explained by their DAC. ANOVA displayed $p = 0.536$ indicating that DAC did not statistically predict the non-Muslim-EAP.

Religiosity

Using factor loading of 0.6, EFA was performed to identify the latent constructs of religiosity (Hair, Sarstedt, Hopkins & Kuppelwieser, 2014). Only 21 items were used to represent the latent constructs of religiosity for Muslim EAs. The names

of the factors were the same as those used by Mahdzan et al. (2017) who adopted Wan Ahmad, Ab. Rahman, Ali and Che Seman's (2008) and Tiliouine and Belgoumidi's (2009) measurement scale. The factors were faith, virtue, obligation, and optional. For this study only three factors were used due to low factor loading of the other factor. Factor one (faith), two (virtue) and three (optional) demonstrated high reliability scores with Cronbach's alpha between 0.843 and 0.971. This study used 19 items to capture the non-Muslim EAs' religiosity constructs. The same procedures were applied to the religiosity data of the non-Muslim EAs. Based on the EFA results, five items were discarded because of low factor loadings. The remaining 14 items produced a five-factor solution. Following the test, factor one (faith) produced a Cronbach's alpha value of above 0.8 which was considered good. The Cronbach's alpha values for factors two (virtue) and three (optional) were 0.752 and 0.629, respectively, which were considered acceptable. Finally, only 12 items were used to represent the latent constructs of religiosity for the non-Muslim EAs.

Level of religiosity

Muslim religiosity level was measured by the religiosity strength represented by Casual (Low religion practice), Moderate (Modest religion practice) and Devout (High religion practice). Similar to Mahdzan et al. (2017), a grand mean was computed as follows:

- Casual - mean scores (μ) were 0.5; standard deviation of 2.915 ($\mu \leq 2.915$)
- Moderate - mean scores were between 2.925 and 3.415 ($2.915 < \mu < 3.415$)
- Devout - mean scores above 3.415 (≥ 3.415)

Using similar procedures, the non-Muslim EAs' religiosity strength was computed as follows:

- Casual - mean scores were 0.5; standard deviation of 2.411 ($\mu \leq 2.411$)
- Moderate - mean scores were between 2.411 and 2.911 ($2.411 < \mu < 2.911$)
- Devout - mean scores above 2.911 (≥ 2.911)

Moderating role of level of religiosity

In Model 2, linear regression on DAC, level of religiosity and Muslim-EAP exhibited moderate R square (65%) signifying that variation of the Muslim-EAP was moderately explained by DAC and level of religiosity. The ANOVA results displayed $p = 0.000$ indicating that the Muslim-EAP was significantly predicted. The subsequent results showed that level of religiosity has significant moderating effect ($p = 0.054$) on the relationship between DAC (technologies and tools expertise) and the Muslim-EAP. The technologies and tools expertise, however, has statistically significant negative main effect on the Muslim-EAP at $p = 0.030$. This result denoted that the higher the DAC (technologies and tools expertise), the lower the Muslim-EAP. The inclusion of the level of religiosity has improved the overall model fit as evidenced by the higher R square (65%) compared to Model 1's R square (49%).

Regression results for DAC, level of religiosity and non-Muslim-EAP indicated low R square (4.2%) demonstrating that variation of the non-Muslim-EAP was weakly explained by the DAC and level of religiosity. ANOVA results showed $p = 0.556$ indicating that the non-Muslim-EAP was not statistically predicted. The inclusion of the level of religiosity slightly improved the overall model fit as evidenced by the higher R square (4.2%) compared to Model 1's R square (1.9%). Nonetheless, the R square is still considered as low.

Dimensions of religiosity

Moderating effects of religiosity dimensions on the relationship between DAC and the EAP were predicted in Model 3 using linear regression analysis.

Regression results showed only the Virtue dimension has significant effect on the relationship between DAC and the Muslim-EAP but not Faith and Optional dimensions. R square = 61.9% suggested that variation of the Muslim-EAP was moderately explained by DAC and Virtue, as supported by ANOVA results of $p = 0.001$. Subsequent results showed that DAC (personal capabilities) has statistically significant positive main effects on Muslim-EAP at $p = 0.011$, while DAC (technologies and tools expertise) has statistically significant negative main effects on the Muslim-EAP at $p = 0.10$ ($p < 0.1$). The result also demonstrated that Virtue as a dimension of religiosity has significant moderating effect ($p = 0.098$, using significant level of $p < 0.1$) on the relationship between DAC (personal capabilities) and the Muslim-EAP. However, the coefficient is -2.084 which denoted the negative direction of the moderating effect of Virtue. In other

words, the higher the religiosity (Virtue) the more negative the effect of DAC (personal capabilities) on the Muslim-EAP. Nonetheless, it can be concluded that Virtue as a dimension of religiosity has improved the overall model fit as evidenced by the higher R square (61.9%) compared to Model 1's R square (49%).

For non-Muslim EAs, the regression results showed only Faith dimension has significant effect on the relationship between DAC and the non-Muslim-EAP but not Virtue and Optional dimensions. The regression result for Faith showed a moderate R square (8.5%) suggesting that variation of the non-Muslim-EAP was weakly explained by DAC and Faith as a dimension of religiosity. The ANOVA results displayed $p = 0.076$ ($p < 0.1$), signifying that the non-Muslim-EAP was significantly predicted. The subsequent results showed that DAC (technologies and tools expertise) has statistically significant positive main effects on the non-Muslim-EAP at $p = 0.007$. Faith as a dimension of religiosity has a significant moderating effect ($p = 0.002$) on the relationship between DAC (technologies and tools expertise) and the non-Muslim-EAP. However, the coefficient is -0.624 which denoted the negative direction of the moderating impact of Faith. In other words, the higher the religiosity (Faith) the more negative the effect of DAC (technologies and tools expertise) on the non-Muslim-EAP. Nevertheless, the inclusion of Faith as a dimension of religiosity has improved the overall model fit as shown by the higher R square (8.5%) compared to Model 1's R square (1.9%). Nonetheless, the R square is still considered as very low.

Discussion

In summary, H1a is accepted for Muslim EAs but not for the non-Muslim EAs. This finding indicates that DAC (personal capabilities) improves the Muslim-EAP. This suggests that personal qualities such as creativity and stress tolerance can improve Muslim EAs performance. This finding corroborates with CPT and Ebrahimi and Hassanein (2018) who demonstrated that DAC has a significant positive relationship with firm's decision-making performance. As for non-Muslim EAs, H1d is accepted (under Model 3). This finding demonstrates that DAC (technologies and tools expertise) enhances the non-Muslim EAs performance. Obviously, expertise in data analytics technology and methods can enhance the performance of the non-Muslim EAs. This finding is consistent with CPT and Ghasemaghaei, Ebrahimi and Hassanein (2018) regarding the potential impact of DAC on performance. Although the finding for H1d for the Muslim EAs is significant, the relationship is negative (under Model 2). The finding suggests that the higher the skill in data analytics technologies and tools, the lower the performance of the Muslim EAs. This could be due to the nature of EAs' work which relies generally on professional opinion. In addition, Omitogun and Al-Adeem (2019) found that EAs lack relevant technical skills and were unfamiliar with related data analysis tools, except Excel. Both H1b and H1c are not accepted. These findings demonstrate that DAC (professional expertise and technical skills) does not influence the EAP. Professional expertise requirements such as problem-solving skills and reporting are among expertise already required by the profession. This finding corroborates Weber's (2020) revelation that the EAs were not well prepared for data analytics and that they only had a moderate sense of urgency to become competent in analytics, owing to their employers' lack of demand for analytics. Overall, the findings showed that certain DAC dimensions influence the EAP. One possible reason might be due to the level of support provided by the auditing firms. Hence, further research is needed to understand other possible factors affecting the DAC and subsequently the EAP. In addition, this study provides an initial investigation into the effects of religiosity on EAP. Future research might want to incorporate other contributing factors affecting EAP such as organizational culture as to understand the effects of various factors affecting performance in other environment or setting.

H2a, H3a, and H4a are not accepted, implying that level of religiosity has no influence on the relationship between DAC (personal capabilities, professional expertise, and technical skills) and the EAP which is inconsistent with prior research by Ali et al. (2015). The insignificant results may be due to the fact that in the audit profession, the EAs are required to comply with the Professional Code of Ethics. For Muslim EAs, H5a is accepted, but not for non-Muslim EAs. This suggests that the relationship between DAC (technologies and tools expertise) and the Muslim-EAP is moderated by level of religiosity. This finding also shows that the more religious the Muslim EAs are – which indicates that they are honest, ethical or trustworthy – the greater the favourable influence of DAC (technologies and tools expertise) on the Muslim-EAP.

H3b and H4b are not accepted, denoting that religiosity (Faith, Virtue and Optional) does not moderate the relationship between DAC (professional expertise and technical skills) and the EAP. These findings do not corroborate Ali et al. (2015) and this may be due to the fact that the EAs already conform to the Code of Professional Ethics. In the case of H2b, however, religiosity (Virtue) significantly moderated the relationship between DAC (personal capabilities) and the Muslim-EAP, but not for non-Muslim EAs. Nonetheless, the direction is not consistent with the prediction of this study that the more religious Muslim EAs are, the lesser the impact of DAC (personal capabilities) on their performance. Likewise, for H5b, religiosity (Faith) significantly moderated the relationship between DAC (technologies and tools expertise) and the non-Muslim-EAP but not for Muslim-EAP. Nevertheless, the direction is not consistent with the

prediction of this study that the more religious non-Muslim EAs are, the lesser the impact of DAC (technologies and tools expertise) on their performance.

This study acknowledged one limitation of this study that was the use of students as proxy for external auditors which could cause problems with generalizability. Nevertheless, because these students had undergone a six-month internship at the accounting firms, this constraint was minimised. As a result of this exposure, they were qualified to act as external auditors' surrogates.

Conclusion

In conclusion, this study reveals that having DAC is critical for EAs because it can improve their performance. This requires the EAs to acquire data analytics skills for rendering audit services. Furthermore, accounting firms should make data analytics training a priority for their staff. Additionally, religiosity, which has been inadequately tested in DAC literature, provides insights into the significant role of religiosity in EAP. Future research could investigate the cost and benefits of using data analytics in enhancing audit efficiency.

Ethical approval

This research received an ethical approval from the Research Ethics Committee (REC) of Multimedia University (Approval Number EA2302021).

Data availability

Underlying data

Figshare: Data Analytics Competency and Religiosity Influence on External Auditors' Performance in Malaysia

<https://doi.org/10.6084/m9.figshare.16803472> (Jaffar et al. 2021)

This project contains the following underlying data:

Data (1): The dataset comprises of demographic data of the external auditors, data analytics competency items, religiosity items and performance.

Data file (2): Questionnaire used to collect data on the external auditors' demographic profile, data analytics competency, religiosity and performance.

Data are available under the terms of the [Creative Commons Attribution 4.0 International license](#) (CC-BY 4.0)

Author contributions

Nahariah Jaffar, Abdul Aziz Ahmad and Noor Adwa Sulaiman were involved in conceptual framework, methodology, analysis, discussion, and writing of the article.

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Prem Lal Joshi

Western Regional Centre, ICSSR, Mumbai, Maharashtra, India

I have read carefully the replies to my comments by the authors. I am satisfied with the authors' replies. Approved.

Competing Interests: Please note that I was an employee of MMU Malaysia from 2013 to October 2019.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 1

Reviewer Report 24 January 2022

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Amal Hayati Ahmad Khair

Leicester Castle Business School, De Montfort University, Leicester, UK

My comments:

This is a potentially interesting paper. The author/s have an interesting context and study involving data analytics competency and religiosity, in which the former is developed based on

four dimensions of competency (i.e. personal capabilities, professional expertise, technical skills, and technology and tools expertise) and the latter, as the moderating factor, is developed based on two measurements of religiosity (i.e. level and dimension), in which their impact were tested on external auditors' performance in Malaysia.

It addresses an important topic, especially since some have proposed that religiosity positively influences individual performance¹ and organisational behaviour and thus has substantial economic implications.² Similarly, some have argued that competency has significant impact on performance.³ However, as currently written, the paper seems to be at a very early stage of development and thus considerable development is needed. Despite the rather small temporal and spatial extent of the study on external auditors' performance (EAP), it should make an important contribution of behavioural studies especially in the auditing within Islamic context.

The paper has initiated discussions on the issues associated with competency and religiosity on the EAP. However, it exhibits a lack of organisation and coherent arguments in some instances. For example, starting from page 3 onwards, some of the ideas and arguments have not been developed adequately, especially with the hypotheses' development. Although the paper has attempted to develop the hypotheses with reference to the literature, the arguments were inadequately discussed and have not been linked properly in some instances. For example, under the 'Dimensions of Religiosity' section on page 5, four dimensions have been used for Islamic religiosity (i.e. faith, virtue, obligation, optional), but these clash with the abstract, which included only three dimensions (i.e. faith, virtue and optional). Another example, the two measurements of religiosity (i.e. level and dimension), which were introduced in 'Competence performance theory and hypotheses' section on page 3, could have been explained clearly how these two dimensions were utilised as moderating factors in the study. Some parts of the methodology sections could have been explained better, for example what it is meant by casual, moderate and devout (refer page 4) for religiosity strength and its link to the EAP.

In term of argument and methodology, the paper is built on appropriate known concepts, and research is properly designed with correct methodology. However, the discussion on research design and sample could have explained the distribution between Muslim and non-Muslim external auditors. The results could have been presented in tables so that they could be understood and communicated better. Nevertheless, the results have been analysed appropriately and conclusions have been adequately tied together the other elements of the paper in term of the research objective, literature reviews and results.

In general, the paper clearly expresses its case by taking into considerations all aspects in term of expected knowledge of readers and appropriate language used. However, it contains a number of typographical errors, occasional stylistic or grammatical flaws, corrections to references, etc. Further proof reading would benefit the audience.

Comments to the Author/s:

The subject of your paper is important and the empirical material you have collected holds potential. However, I believe the paper needs considerable development, particularly around the clarity of the concepts mobilised and model development and cannot be given the status approved until these revisions are made. The highlighted comments offer a number of important observations and suggestions for further improvement.

References

1. Bestyasamala E: THE INFLUENCE OF EMOTIONAL INTELLIGENCE AND ORGANIZATIONAL CITIZENSHIP BEHAVIOR TOWARDS OFFICER PERFORMANCE WITH THE ORGANIZATION AND RELIGIOSITY AS A MODERATING VARIABLE (STUDY ON THE EMPLOYEES OF THE EDUCATION AND CULTURE DEPARTMENT IN DEMAK). *International Journal of Islamic Business Ethics*. 2018; **3** (1). [Publisher Full Text](#)
2. Amin M, Kim I, Lee S: Local religiosity, workplace safety, and firm value. *Journal of Corporate Finance*. 2021; **70**. [Publisher Full Text](#)
3. Fu'ad E, Aminuddin M: Motivation as An Intervening Variables Influence Competency on the Performance of Cooperative Managers. *Journal of Management and Entrepreneurship Research*. 2021; **1** (2). [Publisher Full Text](#)

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Partly

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: My primary research interests are accounting fraud/bribery/corruption, fraudulent accounting practices, auditing, ethics, and corporate governance.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 11 Feb 2022

nahariah jaffar, Multimedia University, Persiaran Multimedia, Malaysia

Dear Prof.

Thank you for reviewing our manuscript. We are grateful for the insightful comments you

have shared.

The following are our responses to your comments:

1- Lack of organisation and coherent arguments in hypotheses development.

Our response: A revision was made to improve the clarity of the hypotheses development section. Additional literature was added to explain the moderating role of religiosity.

2- Unclear on Dimensions of Religiosity.

Clearer explanation was made in the religiosity section regarding the adoption of religiosity dimensions in the study that was based on high factor loading.

3- Unclear on Level of Religiosity.

Clearer explanation was provided in the Level of Religiosity section regarding the meaning of the three levels of religiosity (casual, moderate, devout).

We hope that these responses are acceptable and look forward to your feedback. Thank you again for your time in reviewing our manuscript.

Competing Interests: No competing interests were disclosed.

Reviewer Report 18 January 2022

<https://doi.org/10.5256/f1000research.76844.r99723>

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Khalid Al-Adeem 

College of Business Administration, King Saud University, Riyadh, Saudi Arabia

- The hypotheses are not deduced from a theory or at least literature. For the hypothetico-deduction to be properly implemented, hypotheses need to be deduced from a theory/theories or at least prior literature on the phenomenon being investigated. Without doing so, the work is merely speculative
- Furthermore, the linear regression does not count for the error term in models. However, I see that the authors included the error term in the three models. The author could have employed Structural Equation Modeling (SEM) to count for the error term, and test the three models once as opposed to test them separately.

- With regard to identifying the “latent constructs of religiosity”, I suggest further performing Confirmatory Factor Analysis (CFA) to confirm the loading and assure the existence of such a construct. That is, to validate what the Exploratory Factor Analysis (EFA) suggests.
- There are grammatical errors in this paper, it should be gone over again and these should be corrected.
- The authors write, 'Meanwhile, religiosity (faith) has significant moderating effect on the relationship between data analytics competency (technologies and tools expertise) and non-Muslim external auditors' performance',

I suggest writing the statement this way:

- *“Meanwhile, religiosity (faith) has a significant moderating effect on the relationship between data analytics competency (technologies and tools expertise) and non-Muslim external auditors' performance”.*

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

No

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

No

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Development of Accounting Thought; IFRS; Accounting Research Methodology; Epistemology; Auditor Independence;

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 11 Feb 2022

nahariah jaffar, Multimedia University, Persiaran Multimedia, Malaysia

Dear Prof

Thank you for reviewing our manuscript. We are grateful for the insightful comments you have shared.

The following are our responses to your comments:

1- Hypotheses not deduced from theory

Our response: A revision was made to improve the clarity of the hypotheses development section. This study adopted Competence Performance Theory (CPT) by Korossy (1999) to predict the effects of DAC on the EAP. In addition, additional literature were added to explain the moderating role of religiosity.

2- Adoption of SEM

Our response: The revised manuscript retained the existing data analysis because the current software used in the study was able to analyse the current data and achieved the objectives of the study.

3- Grammatical error

Our response: the manuscript has been sent for English proof reading.

4- To improve one statement in the abstract.

Our response: We have made the necessary changes.

We hope that these responses are acceptable and look forward to your feedback. Thank you again for your time in reviewing our manuscript.

Competing Interests: No competing interests were disclosed.

Reviewer Report 13 December 2021

<https://doi.org/10.5256/f1000research.76844.r99722>

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Prem Lal Joshi

Western Regional Centre, ICSSR, Mumbai, Maharashtra, India

The issues studied in this research are contemporary in auditing research, and limited work has been undertaken so far in this area. Therefore, any research on the effects of data analytics competency on the external auditors' performance is very welcome. The theme and research questions investigated in this study are highly relevant. Additionally, it is interesting to know the moderating effects of religiosity on data analytics competency and external auditors' performance relationship.

This research uses a survey method which is acceptable. The sample size is quite large. The data analytics competency dimensions are indicated by personal capabilities, professional expertise, technical skills, technologies and tools expertise, which may be considered as relevant measures. The religiosity variable is measured by level and dimension (faith, virtue and optional). The theory applied in this research is Competence Performance Theory (CPT) as laid out by Korossy (1999), which is also relevant to this type of research.¹ The hypotheses formulated are duly supported by prior research.

The study findings state that data analytics competency (personal capabilities) has a positive significant effect on the Muslim external auditors' performance. However, data analytics competency does not affect the performance of non-Muslim external auditors. Level of religiosity has a significant moderating effect on the relationship between data analytics competency (technologies and tools expertise) and Muslim external auditors' performance. However, the level of religiosity has no moderating effect on the relationship between data analytics competency and the performance of non-Muslim external auditors.

My main concern is that the authors have not provided clear reasons or justifications for these differences in findings between Muslim external auditors and non-Muslim external auditors. Do both the groups acquire different education training and skills with respect to DAC in Malaysia? Why does this difference occur? Can these findings be generalized to other environments?

I recommend the manuscript for approval subject to addressing the above minor comments.

References

1. Korossy K: Modelling knowledge as competence and performance. *Psychology Press*. 1999.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Yes

Are all the source data underlying the results available to ensure full reproducibility?

Yes

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: Please note that I was an employee of MMU Malaysia from 2013 to October 2019.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 11 Feb 2022

nahariah jaffar, Multimedia University, Persiaran Multimedia, Malaysia

Dear Prof

Thank you for your time in reviewing our manuscript. We are greatly appreciative of the insightful comments that you have provided.

Our responses to your comments are as follows:

1- Justification for the differences in findings between Muslim external auditors and non-Muslim external auditors.

Our response: The revised version provided the justification (in the discussion section) that one possible reason might be due to the level of support provided by the auditing firms. Hence, further research is needed to understand other possible factors affecting the DAC and subsequently the EAP.

2- Generalizability of the findings to other environments.

Our responses: In the discussion section of the revised version, it is stated that the study provided an initial investigation into the effects of religiosity on EAP. Future research might want to incorporate other contributing factors affecting EAP such as organizational culture to understand the effects of various factors affecting performance in other environment or setting.

We hope that our responses are acceptable and look forward to your feedback. Thank you again for your time in reviewing this manuscript.

Competing Interests: No competing interests were disclosed.

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