Assessing the role of factors affecting the adoption of VAT-compliant accounting systems

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C H R O N I C L E	A B S T R A C T
	This study explores technology adoption through the lens of Technology Acceptance Model and Technology-Organization-Environment model in the context of Small and Medium Enterprises (SMEs) operating in the United Arab Emirates. A survey designed research was carried out at UAE SMEs, leading to a sample of 370 establishments that were included in the final analysis. Data was analyzed using partial least squares structure equation modelling technique. The main findings propose that the Computer Self-Efficacy (CSE), Compatibility (COM), significantly affect the adoption of VAT-compliant accounting systems. Further, the possible mediator relationships are partially supported. Implication and limitation of study are also discussed.

1. Introduction

As new challenges faced by organizations do vary by type, such as: financial, technological, or intellectual (i.e. human capital), so do competitive pressures broaden by scope for Small-Medium Enterprises (SMEs). The cutthroat business contextual factors lead organizations to utilize the management functions in an appropriate way to attain business success. Scholars have come to a consensus that "innovation is a transformative force, it also has the power to craft, create, weave and even shape the model of the world economy; given the current development in today's digital world as noted by prior researchers"(Hedman & Kalling, 2003). Technological development is considered a crucial factor in the globalization changing effect on both business models (i.e. strategic level) and transactions (i.e. functional level) (Kadar et al., 2014). One such change, that SMEs are facing, pertains to taxation systems such as implementing the Value-added Tax (VAT) (Egger & Raff, 2015; Kawano & Slemrod, 2016; Smith, 2015). For instance, more than 160 countries implemented the VAT system since it was classified as an efficient way for tax collection(Azmi et al., 2016; Hwang & Min, 2015).

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VAT compliance activities consume a substantial amount of time for SMEs compared with other types of taxes, such as capital gains tax and income tax (Hansford & Hasseldine, 2012). According to Azmi et al. (2016) "One major impact of VAT on SMEs' internal resources is the adoption of VAT-compliant accounting systems, which tag transactions with specific codes that enable an accurate calculation of VAT amounts (including taxes that firms have charged to their customers as well as the taxes charged by their suppliers)". Moreover, SMEs' decisions to employ accounting information systems rests on, at least partially, the need to deal with these tax compliance activities (Eichfelder & Schorn, 2012; Kamleitner et al., 2012; Ojeka et al., 2017; Tusubira & Nkote, 2013). Bearing in mind that SMEs are less likely to invest in computerized systems due to associated costs that are harder to be economically justified on a smaller scale (Gangwar et al., 2015a).

Implementing tax compliance costs (TCC) systems involves measuring organizational resource consumption or utilization untaken to abide by tax regulations. As such, TCC are defined as "those costs incurred by taxpayers, or third parties such as businesses, in meeting the requirements laid upon them in complying with a given tax structure. For a business, the compliance costs include the cost of collecting, remitting and accounting for tax on the products or profits of the business and on the wages and salaries of its employees together with the costs of acquiring the knowledge to enable this work to be done including knowledge of their legal obligations and penalties" (Pope, 2011).

A number of theoretical lessons have been employed to make sense of information technology acceptance and use. While "theory of reasoned action" (TRA) (Ajzen & Fishbein, 1980) represents the earlier concrete theory for the purpose explaining use and employment of information technology, newer variations such as the "theory of planned behavior" (TPB) (Ajzen, 1991), and "Technology Acceptance Model"(TAM) (Davis et al.,1989a) have been applied as well. In particular, this paper takes the view that TAM framework is more relevant theory for purpose of this paper's endeavor as it represents a robust, highly parsimonious, and more predictive tool than the other frameworks. Such a view has been confirmed by various scholars (Amoako-Gyampah & Salam, 2004; Lee et al., 2010; Ma & Liu, 2005; Venkatesh & Davis, 2000). TAM variables have been used and extended by modern scholars due to the evolving nature of technology and modern work-setting. For example, classified the following as external factors; computer experience, self-efficacy. On the other hand, "Technology-Organization-Environment" TOE framework is thought to be a vigorous and fully flavored model to examine firm-level adoption of various IS applications (Tornatzky et al., 1990). The main objective of this study is to adopt the TAM model and TOE framework to assess the factors affecting VAT-accounting system adoption in SMEs. By extending TAM model and testing computer-self efficacy predictive explanatory power, while from TOE framework the researcher adapts the following variables use compatibility and relative advantage as technological factors, tax compliance costs (TCC) as an organizational factor.

The current study contributes to the existing literature by examining the developed model drawing on the aforementioned theories in UAE SMEs context. Further, this study highlights the role of TCC in the adoption of VAT-compliant accounting system in SMEs. To do so, the researcher presents a holistic view of the factors that affect SMEs adoption of VAT-compliant accounting systems.

2. Literature review and hypotheses development

The adoption of tax-compliance technology, including accounting systems, depends on several factors. First, employees' abilities and skills to embrace using new systems. This represents the starting point for technological change adaptation. Second, firms' infrastructure and capacity, to support new technology and/ or technological application, plays a significant role in adapting to new systems or applications. Third, innovation levels within firms, which are associated with higher yields, offer a relative advantage that affects the acceptance of employees or firms to apply information systems. Fourth, adopting tax-compliant accounting systems creates a financial burden that might discourage or delay the process as the resources of SMEs, the subject of this study, are limited.

Previous studies have explored the influence of different factors on the intention to adopt tax- compliant accounting system. Categorizing these factors in a general view leads to technological, organizational, or environmental groups. Below is a summary of literature used to build the hypotheses of this survey.

2.1. Computer self-efficacy and intention to use (adoption)

The term " self- Efficacy" refers to the extent of confidence that an individual retains in relation to his/ her ability to perform an allocated task (Taylor & Todd, 1995). Computer self-efficacy, in information technology context, refers to the confidence of an individual in his/ her ability to use a computer and its technological application. Marakas et al. (1998) mentioned that computer self-efficacy refers to users' perception of efficacy when performing a specific task using a computer-based application. Computer self-efficacy is an indicator of acceptance and use behavior of IT application. Computer-efficacy has an impact on the intention of user, intention to implement information systems, outcome, perceived usefulness, and ease of use (Compeau & Higgins, 1995a, 1995b; Hill et al., 1987; Hsia et al., 2014; Jia et al., 2014; Shih, 2006). Furthermore, researchers found that perceived usefulness, expected outcome, and ease of use are mediating the relation between computer self- efficacy and adoption (Ma & Liu, 2005; Taylor & Todd, 1995; Venkatesh & Davis, 2000; Yi & Hwang, 2003). However, these findings are not well explored in the literature of SMEs, precisely in the non-western countries such as the UAE. To fill the gap and to reach more solid generalization the author proposes the following hypothesis:

H_1: Perceived Computer self-efficacy influences the SMEs' adoption of VAT-compliant accounting systems.

2.2. Compatibility and intention to use (adoption)

System compatibility issues refer to the level of technical capacity of the firm and existing infrastructure that are aligned to modern technology-based systems (Gangwar et al., 2015b; Géczy, Izumi, & Hasida, 2012). For instance, cloud solutions increase the complexity of compatibility issues on firms' decisions to adopt cloud solutions (Marston et al., 2011b). Technology compatibility is applicable when determining if an innovative activity is seen as consistent or inconsistent with previous experience, user's needs, and existing values (Calisir et al., 2009). To reduce incompatibility, VAT-compliant accounting systems must consider the existing architecture for work processes (e.g., data import and export, and format interfaces and data structure). Some previous MIS & ERP studies have mentioned that compatibility is a reliable basis in determining perceived usefulness, perceived ease of use, and intention to use (Aljarrah et al., 2016; Calisir et al., 2009; Chen & Tan, 2004; Karahanna et al., 2006). Based on the aforementioned literature, as of now the role of system compatibility is not well known and explored in SMEs, to fill this gap the researcher developed the following hypothesis:

H_2: Perceived Compatibility influences the SMEs' adoption of VAT-compliant accounting systems.

2.3 Relative advantage and intention to use (adoption)

Relative advantage explains the benefits from the adoption of technologies, such as; investing in accounting system compliant with VAT (for example: XBRL) (Henderson et al., 2012; Raut et al., 2018). Firms can integrate this technology with the existing financial reporting system that leads to: saving costs, improving the decision-making process, and improving information transparency (Garbellotto, 2009; Hodge et al., 2004). Integrating the accounting system with the financial reporting processes will enhance the process of tagging daily transactions and improve needed documentation. However, an in-depth investigation is warranted to examine the role of relative advantage in adopting VAT-compliant accounting systems, these new technologies will be expected to add value to SMEs through saving costs as reported in literature, which suits all enterprises types as more cash flow is a welcomed addition to any financial statement. To examine the aforementioned role, the following hypothesis was developed:

H_3: Perceived Relative advantage influences the SMEs' adoption of VAT-compliant accounting systems.

2.3 Tax compliance cost and intention to use (adoption)

The lack of necessary resources in SMEs reduces their investments in IT and encourages them to use relatively small level of work-process computerization (Iacovou et al., 2006; Syed et al., 2011; Willcocks & Lacity, 2002). It is hypothesized that the adoption of VAT-compliant accounting systems is influenced by the resources allocated for tax-compliance activities. Literature indicates that SMEs may bear a significant cost when adopting and using tax-compliant accounting systems (Evans et al., 1996; Halabi et al., 2010). A limited number of studies have discussed the role of tax compliance cost and its role in the adoption of new technologies, so the researcher developed the following hypothesis to examine an under researched area of inquiry:

H4: Perceived Tax compliance cost influences the SMEs' adoption of VAT-compliant accounting systems.

2.4 The mediating role of Perceived usefulness and Perceived ease of use of adoption of VAT-compliant accounting systems

Technically, VAT-compliant accounting systems perceived usefulness denotes the extent to which IS application user believes the application could improve his/her work. Perceived usefulness is "the extent to which a person believes that using a particular system would enhance his or her job performance". Empirical evidence suggests a link between perceived usefulness and IS application usage and adoption (Ajzen, 1991; Fusilier & Durlabhji, 2005; Leng et al., 2011). Similarly, perceived ease of use of VAT-compliant accounting systems is the degree to which potential IS application user anticipates the application to be effortless (Davis, 1989). In other words, user's belief that using the software would require minimum effort (Venkatesh & Davis, 2000). Empirical evidence supports a link for perceived ease of use with system usage (King & He, 2006; Kositanurit et al., 2006; Nah et al., 2004). Based on the aforementioned theoretical and empirical evidence, the following hypotheses were developed:

H5a: Perceived usefulness mediates the relationship between computer self-efficacy and SMEs' adoption of VAT-compliant accounting systems.

H5b: Perceived ease of use mediates the relationship between Computer self-efficacy and SMEs' adoption of VAT-compliant accounting systems.

H5c: Perceived usefulness mediates the relationship between Compatibility and SMEs' adoption of VAT-compliant accounting systems.

H5d: Perceived ease of use mediates the relationship between Compatibility and SMEs' adoption of VAT-compliant accounting systems.

3. Methods and sample of the study

Recent technological advancements and the associated technology adoption in SMEs coupled with economic and taxation progress make the targeted population a relevant and timely study context to investigate tax compliance costs and adoption of IT. The sampling technique used in this study is judgmental sampling, where subjects are selected if considered to be archetypal to the studied population (Judd et al., 1991). Judgmental sampling is suitable for such type of studies. SMEs comprise 94 per cent of all active companies in the UAE, contributing 40 per cent to the country's GDP. The SMEs collectively employ 72 per cent of the country's working population. The researcher has contacted UAE SMEs, and those that agreed to participate in the study were included. The author has selected one employee from each SME in order to collect the data presented in this study.

3.1. Items measured

- **Computer self-efficacy (CSE)**was measured with nine-items adopted from previous empirical work (Compeau & Higgins, 1995b).
- **Compatibility (COM)** was measured with four items adopted from prior research (Premkumar & Ramamurthy, 1995; Thompson et al., 1991).
- **Perceived usefulness** (PU) was measured with six items adopted from previous studies (Davis et al., 1989b; Dishaw & Strong, 1999; Wixom & Todd, 2005).
- **Perceived Ease of use (PE)** was measured with six items adopted from previous studies (Davis et al., 1989a; Shih, 2006).
- **Tax compliance costs** (TCC) which was adapted from (Abdul-Jabbar & Pope, 2008).
- **Relative advantage (RA)** was measured with four items adopted from previous studies (Ghobakhloo et al., 2011; Lian, Yen, & Wang, 2014).
- **Intention to use (IU)** was measured with two items adopted from previous studies (Ajzen & Fishbein, 1980; Rajan & Baral, 2015).

3.2. Data analysis

This research used Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze the collected data and test the hypotheses. While PLS-SEM has recently received many scholarly criticisms such as lack of quality indices and the inability to capture measurement error, it can work efficiently under certain circumstances (Sarstedt et al., 2016). This paper takes the view that PLS provides more robust results when the model has multiple structural paths relationship (Akter et al., 2011; Alsaad et al., 2018; Elrehail et al., 2018). Moreover, PLS is more appropriate when the study model contains complex and multiple mediated-moderation relationships (Hair et al., 2014; Petter, 2018). Armed by the aforementioned arguments PLS techniques and analysis were applied. PLS technique has two stages of analysis, the first is the measurement model and the second is the structural model (Wetzels et al., 2009). To analyze the data, Statistical Package for the Social Sciences (SPSS) and ADANCO were applied. Further, ADANCO is "new software for variance-based structural equation modeling. It implements several limited-information estimators, such as partial least squares path modeling (also called PLS modeling, PLS-SEM, or simply PLS) or ordinary least squares regression based on sum scores" (www.composite-modeling.com).This analysis started by the demographic information obtained from the dataset which is presented in Table 1 to Table 4.

The researcher asked SMEs representative to participate in the study, these representatives include (owner, manager, or director). Out of the 600 SMEs identified, only 370 valid responses were gathered, the response rate 62% which is acceptable in studies conducted in middle-eastern countries in related fields of inquiry(Alzghoul et al., 2018) . With regards to gender, approximately 66% of the respondents were men; and about 34% were women as showed in Table 1.

Table 1
Gender distribution

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	245	66.2	66.2	66.2
Female	125	33.8	33.8	100.0
Total	370	100.0	100.0	

Table 2 shows the positions occupied by the respondents, the dataset showed that 7.3% of the respondent are the owners, 10.3% of the respondents are managers and the rest of them are directors.

Table 2
Position of respondent

	Frequency	Percent	Valid Percent	Cumulative Percent
Owners	27	7.3	7.3	7.3
Managers	38	10.3	10.3	17.6
Directors	305	82.4	82.4	100.0
Total	370	100.0	100.0	

While an industry involves the assembly of products and services in an economy, it might also refer to a group of enterprises that manufacture a specific type of goods or services. In an attempt to capture the sector of the focal SMEs, the respondents were asked to name the industry they operate in. Out of the 370 responses, 64.3% (238) of the SMEs surveyed were in the manufacturing sector; and 35.7% (132) operate in the wholesale and retailing industry. See Table 3 below.

Table 3
The classification of sectors

	Frequency	Percent	Valid Percent	Cumulative Percent
Manufacturing	238	64.3	64.3	64.3
Retailing	132	35.7	35.7	100.0
Total	370	100.0	100.0	

Level of education of the SMEs representatives varied between: bachelor's degree holders 83% (327), Postgraduate degrees 11.7% (46), and the rest 5.3% (21) of the respondents have high school diplomas. See Table 4.

Table 4
Educational background

	Frequency	Percent	Valid Percent	Cumulative Percent
High School	21	5.7	5.7	5.7
Bachelor's	303	81.9	81.9	87.6
Postgraduate	46	12.4	12.4	100.0
Total	370	100.0	100.0	

Next, the researcher assesses the measurement model, a set of analyses are conducted to ensure the reliability and validity of the variables. Several tests applied to get the values of Cronbach's Alpha, Construct Reliability and Convergent Validity. As shown in Table 5 the values of Cronbach's Alpha are above the threshold 0.70 as recommended by Nunnally (1978). These values are similar to results in recent research (e.g. Alnajdawi et al., 2017; Elrehail, 2018).

Table 5
Construct Reliability and Cronbach's alpha

Construct	Dijkstra-Henseler's rho (ρ_A)	Jöreskog's rho (ρ_c)	Cronbach's alpha(α)	AVE
CSE	0.95	0.96	0.95	0.71
COM	0.91	0.93	0.90	0.77
PU	0.91	0.93	0.91	0.70
PE	0.93	0.94	0.92	0.73
IU	0.74	0.89	0.74	0.79
TCC	0.84	0.90	0.84	0.76
RA	0.89	0.90	0.87	0.71

After that the discriminant validity values is assessed using Fornell-Larcker criterion (Fornell & Larcker, 1981; Jahmani et al.,2018). The dataset shown discriminant validity is also satisfied if the average variance extracted (AVE) for all constructs is more than 0.50 and the square root of AVE is greater than each correlation coefficient (Alatailat et al., 2019; Alsaad et al., 2017; Becker et al., 2012). See Table 6 below:

Table 6
Discriminant validity values using Fornell-Larcker criterion

Construct	CSE	COM	PU	PE	IU	TCC	RA
CSE	0.7131						
COM	0.5385	0.7743					
PU	0.3907	0.3301	0.7005				
PE	0.4853	0.3589	0.6483	0.7260			
IU	0.4262	0.2195	0.3479	0.4701	0.7937		
TCC	0.4625	0.3406	0.4235	0.4424	0.5580	0.7558	
RA	0.5061	0.5355	0.4256	0.4462	0.3864	0.4697	0.7139

Squared correlations; AVE in the diagonal

After examining the measurement model and concluding that validity and reliability values are above the accepted thresholds, the researcher moved forward to examine the structural model. In this study, two structural models examined, the first one was for testing the direct effect, and the second was for testing the indirect effect (i.e. mediation). Multicollinearity values were assessed, the multicollinearity is defined as a "phenomenon in which one predictor variable in a multiple regression model can be linearly predicted from the others with a substantial degree of accuracy" (Farrar & Glauber, 2006). Further, variance inflation factor (VIF), which identifies the correlation between independent variables and the strength of that correlation, was examined, and all values of VIF have ranged between 1-5 as recommended by (Ringle et al., 2015). Next, Table 7 presents the total effect inference and hypotheses, for determining the results of hypotheses the researcher depends on the P-value and T-value. As noted in Table 7, H_1, H_2, H_3, and H_4 study the direct effect on adoption, received empirical support from our dataset. Lastly, mediation analysis for H_{5a-d} received empirical support.

Table 7
Total Effects Inference

Effect	Original coefficient	Mean value	Standard error	t-value	p-value (2-sided)
CSE → PU	0.4407	0.4432	0.0834	5.2849	0.0000
CSE → PE	0.5568	0.5570	0.0584	9.5377	0.0000
CSE → IU	0.3646	0.3639	0.0763	4.7789	0.0000
COM → PU	0.2511	0.2499	0.0796	3.1535	0.0016
COM → PE	0.1905	0.1912	0.0620	3.0742	0.0021
COM → IU	-0.1712	-0.1708	0.0575	-2.9773	0.0029
PU → IU	-0.0737	-0.0697	0.0739	-0.9970	0.3188
PE → IU	0.3191	0.3164	0.0620	5.1481	0.0000
TCC → IU	0.4621	0.4596	0.0553	8.3509	0.0000
RA → IU	0.1399	0.1440	0.0669	2.0903	0.0366

4. Discussion and implication of the study

Drawing on the TAM model and TOE framework, this study aimed at assessing the factors influencing SMEs to adopt VAT-compliant accounting system. Data curated from SMEs working inside UAE. Primarily, data showed consistency with prior studies used the TOE framework and TAM model in IT adoption in SMEs (Awa et al., 2015; Ramdani et al., 2013; Ramdani et al., 2009). Technology is playing a crucial role in the development of SMEs performance is observed through VAT-compliant accounting systems positive effect on enhancing their activities and the way of collecting VAT related information (Azam, 2015). The paper proposed that computer self-efficacy, compatibility and relative advantage were associated with VAT-compliant accounting systems adoption. These hypotheses have received empirical support, and our results are consistent with previous studies that covered the SMEs sector using the TOE framework and TAM model (Azmi et al., 2016; Ghobakhloo et al., 2011). Further, TCC is not classified as a technological factor that motivates the organization to adopt VAT-compliant accounting systems, as prior literature classified it as an external learning source for the new adopters of VAT-compliant accounting systems. The TCC needed to understand the accounting process, costing and pricing strategies,

the results from the dataset shown that TCC is associated with adoption of VAT-compliant accounting systems and consistent with existing literature (Azmi et al., 2016; Halabi et al., 2010).

Several noticeable contributions can be highlighted for theory and practice. First, this study was conducted in non-western context, specifically in UAE to provide a comprehensive overview of the SMEs sector and their adoption of information technology, more precisely the VAT-compliant accounting systems. Second, this study utilized the TAM model and TOE framework to provide academic readership and practitioners with an in-depth review of the existing literature and empirical evidence for the positivity of VAT-compliant accounting systems adoption. Finally, SMEs sector plays a dominant role in employment and the economic development of UAE. This study enhanced the understanding of SMEs usage of IT to reduce costs and save time by adopting VAT-compliant accounting systems.

5. Limitation and future research venues

The key limitations of this study are as follows. First, the generalization of our results is limited to the SMEs sector and limited to one country (i.e. UAE). Second, the cross-sectional design of our study limited the understanding of changes that would occur after implementing the VAT-compliant accounting systems, the researcher recommends conducting longitudinal studies as a future research venue. Lastly, common method variance could potentially be affecting the data since variables were gathered in the same time period through using one method of data collection.

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