

SMEs' tax compliance costs and IT adoption: the case of a value-added tax

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ABSTRACT

The objective of this study is to examine the factors behind the adoption of a tax-compliant accounting system among small and medium-sized enterprises (SMEs) using the technological–organizational–environmental (TOE) framework, particularly the role of tax compliance costs in fostering the adoption of this system. This study makes a novel contribution by attempting to link the influence of tax compliance costs to the information technology (IT) adoption literature. Questionnaires were distributed to 401 SMEs, and data were analyzed using partial least squares. The results suggest that the TOE framework is useful for examining factors that affect SMEs' IT adoption decisions; the influence of perceived compatibility, complexity, relative advantage, and mimetic and regulatory pressure is important for the adoption of a value-added tax (VAT)-compliant accounting system. Moreover, the impact of compatibility, learning from external sources, and perceived coercive pressure on the adoption of a VAT-compliant accounting system is moderated by tax compliance cost.

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1. Introduction

A value-added tax (VAT) has been implemented in 160 countries because it is an efficient method of tax collection. VAT is perceived to be highly efficient in terms of tax turnover because it provides greater revenue collection and, at the same time, narrows deficits (Lee et al., 2013). VAT has a different effect on businesses, increasing both their start-up and ongoing operating costs; this effect is stronger for small and medium-sized enterprises (SMEs) (Evans et al., 1996; Gunz et al., 1995). VAT compliance activities consume a substantial amount of time for SMEs compared to other types of taxes, such as capital gains tax and income tax (Hansford and Hasseldine, 2012). SMEs are also more likely to rely on internal resources rather than external sources, such as external tax advisors, to comply with tax law (Eichfelder and Schorn, 2012; Eichfelder and Vaillancourt, 2014; Hanefah et al., 2002). 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 firms have charged to their customers as well as the taxes charged by their suppliers). The difference between these two amounts is the amount of VAT that firms pay to, or claim as, refunds from the government. These tax compliance activities are facilitated by the accounting system. Prior literature (Eichfelder and Schorn, 2012; Halabi et al., 2010; Marriott and Marriott, 2000) has found that these tax compliance activities are a major reason behind SMEs' adoption of an accounting system.

One way to measure the amount of resources that a firm utilizes for tax compliance activities is to use the firm's tax compliance costs. Tax compliance costs (Sandford et al., 1989) are defined as

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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 (p.10).

Existing research on SME tax compliance costs has been primarily concerned with factors that influence compliance costs and how these costs can be measured effectively (Evans et al., 1996; Hansford et al., 2003). Hansford et al. (2003) found that firms using a computerized accounting system usually record higher tax compliance costs than those using a manual method. One possible reason for this is that firms allocate costs attributed to the computerized accounting system separately while costs associated with the manual method are included as part of the many roles performed by SME owner-managers. The researchers highlighted the need to examine the relationship between taxation and information technology (IT) adoption. Evans et al. (1996) indicated that SMEs incur relatively greater tax compliance costs than bigger firms and that a trend exists toward greater utilization of computers for tax purposes. These studies offer insights into possible links between tax compliance costs and accounting system adoption.

The current study contributes to the literature by empirically examining SMEs' perception of their tax compliance costs as an important factor in their accounting system adoption. Our study attempts to position tax compliance costs in the IT adoption framework for SMEs. In doing so, we provide a more comprehensive picture of the factors that affect SMEs' adoption of an accounting information system. In other words, instead of focusing exclusively on tax compliance costs as the sole factor in SMEs' adoption of an accounting system, we examine the influence of tax compliance costs as one factor in IT adoption. This study also contributes to practice by providing managers and management teams with an understanding of the factors affecting accounting system adoption. This understanding enables managers to make informed decisions regarding integration and use of a tax-compliant system in their organizations' accounting system, particularly in the initial stages of the system's adoption.

We selected the technological–organizational–environmental (TOE) framework (Henderson et al., 2012; Kuan and Chau, 2001; Tornatzky and Fleischer, 1990) as an appropriate theoretical foundation for investigating this type of adoption among SMEs. A VAT-compliant accounting system not only facilitates the recording and calculation of tax returns, but also provides proper recordkeeping. We believe that a VAT-compliant accounting system improves the compliance and monitoring of companies' transactions in regard to VAT payments because of the requirement to map the VAT taxonomy to these transactions. Survey data from 401 SMEs were used to test the TOE framework. Based on partial least squares analysis, the results suggest that all the technological factors significantly influence the adoption of a VAT-compliant accounting system. Only the environmental variable, perceived coercive pressure, does not significantly influence the adoption of a VAT-compliant accounting system. In addition, the organizational variable, learning from external sources, does not significantly influence the adoption of a VAT-compliant accounting system. Tax compliance costs, as a measure of tax compliance activities, have a moderating effect on perceived comparability, learning from external sources, and perceived coercive pressure; these variables belong in technological, organizational, and environmental factors, respectively. Our study offers insights into the impact of the early stages of VAT implementation on SMEs.

The paper is organized as follows. First, the background of the VAT system in Malaysia is presented, followed by the literature review and theoretical background of the study and the hypothesis development section. Next, the methods and findings are presented. Last, discussion and implications of the study are presented.

2. SMEs and the goods and services tax in Malaysia

SMEs in Malaysia have played an important role in the economic growth of the nation. According to the 2011 Malaysian Economic Census, SMEs accounted for 97.3% of total business establishments in 2010 or 645,136 business establishments (SME Corp, 2016). SMEs contribute 35.9% to Malaysia's gross domestic product (GDP), 65% to total employment (about 6.2 million employees), and 17.8% of total exports (SME Corp, 2015, 2016). SMEs are defined as businesses in the manufacturing sector with sales turnover not exceeding RM50 million (USD12 million) or employing fewer than 200 full-time employees; the term also covers businesses in other sectors either with sales turnover not exceeding RM20 million (USD4.8 million) or that employ fewer than 75 full-time employees (SME Corp, 2016). Based on this definition, large numbers of SMEs have been affected by the introduction of the GST in Malaysia because this tax required businesses to be GST-registered at the low threshold of a yearly turnover of more than RM500,000 (approximately USD120,000) of taxable supplies. The government had repeatedly attempted to introduce the GST in Malaysia in 2005 and 2007, but it was not implemented until April 2015 (Ng, 2013). Prior to introduction of the GST, sales tax and service tax applied and only affected certain businesses. Sales tax applied only to manufacturers and importers while the service tax was imposed on service providers that met certain revenue thresholds.

Prior literature (Evans et al., 1996; OECD, 2009, 2013) has found that tax compliance activities affect SMEs more than larger organizations. The impact of being GST-registered for SMEs is that they either become first-time adopters of an accounting system or, for those that already have an accounting system, must ensure that their accounting system is GST compliant and able to accommodate GST requirements (Star, 2014). This has significant implications for SMEs due to the demands that GST puts on their operational and financial activities. For example, having voluminous transactions per month would pressure SMEs to have a dedicated staff with adequate competency to monitor the GST charged to customers and refunds from the government. GST-registered companies are also subject to audits and investigations by relevant authorities and, thus, exposure to possible fines

and penalties. Palil et al. (2013) found that SMEs had a low level of awareness and knowledge of GST requirements despite its impending implementation in 2015.

GST-compliant accounting systems in Malaysia have two essential features. The first is the inclusion of GST taxonomies for financial transactions—namely, 13 codes for purchases and 10 for supply (RMC, 2014). Second, the system generates a GST audit file that tracks all the transactions made by the company and generates a report for audit purposes (RMC, 2014). These features create complexities for SMEs because they need to identify day-to-day operations that have GST and non-GST implications and tag them with the appropriate GST code, which may differ across industries and transactions, prepare proper GST documentation such as tax invoices for all transactions, and file the monthly GST returns (Kannaa, 2015). SMEs in Malaysia currently face integration issues and may find it difficult to comprehend the full benefits of the system to their businesses (Habib, 2015; Khoo, 2015).

3. Literature review and theoretical background

In choosing the theoretical framework for our research, we sought one that would both assist in understanding the internal and external environments of SMEs and integrate them with the tax compliance costs to provide a broader understanding of the adoption of a VAT-compliant accounting system. We found that the TOE framework was suitable for our purpose. The TOE framework, developed by Tornatzky and Fleischer (1990), is frequently used as a theoretical lens through which to explain an organization's intention to adopt information technology. The TOE posits that technological, organizational, and environmental variables influence an organization's intention to adopt IT (Thong, 1999).

Researchers have applied the TOE framework to investigate the adoption of a variety of innovations, such as electronic data interchange and information systems, by small businesses (Iacovou et al., 1995; Kuan and Chau, 2001; Thong, 1999). The TOE framework identifies three aspects of a firm's context—technological, organizational, and environmental—that influence the firm's decision to adopt a technological innovation (Henderson et al., 2012; Thong, 1999; Zhu et al., 2006). Technology factors focus on the perceived characteristics of both existing and new technologies (Henderson et al., 2012; Thong, 1999; Zhu et al., 2006). Organizational factors, including scope, size, and amount of slack resources available internally, describe those attributes of a firm that may affect adoption decisions (Henderson et al., 2012; Thong, 1999; Zhu et al., 2006). Environmental factors include aspects of the surroundings in which the firm conducts business—the industry, competitors, and dealings with government—that may affect adoption decisions (Henderson et al., 2012; Thong, 1999; Zhu et al., 2006). Combined, these three groups of contextual factors influence a firm's intention to adopt IT.

The TOE framework constitutes a high-level theoretical basis for investigating adoption; thus, the specific factors identified within the three contexts do not provide the theoretical rationale necessary to establish causal relationships. Henderson et al. (2012); Thong (1999), and Zhu et al. (2006) suggest that the TOE framework should be combined with other theories to identify specific variables in the technological, organizational, and environmental factors and to establish the causal relationships needed for hypothesis development. Our study uses the TOE framework to specify the categories of factors (technological, organizational, and environmental) affecting adoption of a VAT-compliant accounting system. Similar to Henderson et al. (2012), our study adopts technological factors from the diffusion of innovations (DOI) theory (relative advantage, compatibility, complexity), organizational factors from organizational learning perspectives (learning from external sources), and environmental factors from institutional theory (mimetic pressure, coercive pressure, and regulatory pressure). Our study utilizes the DOI theory developed by Rogers (1995) because it is most applicable for innovations with an intra-organizational locus of impact (Thong, 1999) such as an accounting system. This theory, DOI, has also been combined with other theories by researchers such as Henderson et al. (2012) and Thong (1999) to provide a richer and potentially more explanatory model of IT adoption. The information system characteristics that are the focus of this research are relative advantage, compatibility, and complexity. These variables were used because they have been consistently related to adoption (Henderson et al., 2012; Premkumar and Roberts, 1999; Ramdani et al., 2009; Tornatzky and Klein, 1982).

For the organizational factors, studies such as Henderson et al. (2012); Rai and Patnayakuni (1996) and Zmud (1983) support the critical role of external information in the organizational innovation process. The learning from external sources construct is drawn from the organizational learning perspectives developed by Attewell (1992). Learning from external sources is a suitable aspect of the organizational variable for this study because VAT-registered SMEs must understand how their accounting system tracks their transactions through the tagging process so that accurate VAT calculations are charged and claimed by companies. Tagging these business transactions is complex when transactions are too numerous to tag manually and include more complex business transactions. Learning from external sources offers insights into how organizations, particularly SMEs, can learn to cope with the technology changes that come with being VAT registered.

SMEs' adoption strategies have unique differences from larger organizations with respect to IT adoption. Swanson (1994) identified accounting systems as Type II innovations that affect the administrative aspects of the business. The adoption of these types of system is likely to be influenced by organizational size. Thong (1999) suggested organizational size as the most significant characteristic that determines the extent of IT adoption, with factors such as greater informational needs, adequate financial resources, and IT-knowledgeable employees being crucial in the adoption of IT systems for SMEs. Tax compliance activities create a greater need for financial information in SMEs so that they prepare the correct computations and supply the relevant supporting documents based on the calculations. Thus, technological and organization factors are important and contribute to the successful adoption of an accounting system (Kuan and Chau, 2001; Thong, 1999).

For tax compliance costs, many studies (Eichfelder and Schorn, 2012; Halabi et al., 2010; Hansford et al., 2003; Marriott and Marriott, 2000) on accounting system use or adoption point to tax compliance activities as one reason behind SMEs' adoption or use of an accounting system. However, no IT adoption study has empirically verified or measured the role of tax compliance activities in the study of accounting system adoption. As previously indicated, these tax compliance activities can be measured by their costs (Sandford et al., 1989). Thus, tax compliance cost can become an organizational variable because, similar to the treatment of financial cost as an organizational variable (Iacovou et al., 1995; Kuan and Chau, 2001), it is a firm attribute that may influence adoption decisions. Financial cost in these studies refers to the allocation of resources, such as "installation costs, implementation of any subsequent enhancements, and ongoing expenses during usage (such as communication charges, usage fees, etc.)" (Iacovou et al., 1995, p. 469), to achieve the benefits of IT adoption. Hansford et al. (2003) found possible links between high tax compliance costs and the use of computerized accounting systems among SMEs. Eichfelder and Schorn (2012) found that the use of tax software is more cost-efficient for larger firms than smaller ones. We believe that a VAT-compliant accounting system improves the compliance and monitoring of companies' transactions with respect to VAT charged and paid because of the requirement to map the VAT taxonomy to these transactions and perform proper recordkeeping. The organizational learning perspective is a useful context for identifying the important aspects of organizational factors because it brings together tax compliance costs and learning effective use of an accounting system.

Environmental factors such as the influence of trading partners and regulatory pressures are also critical reasons behind the adoption of IT among SMEs (Iacovou et al., 1995; Kuan and Chau, 2001). SMEs that strongly depend on trading partners or supply chain networks for their survival will adopt an IT system because SMEs are seen as the "weaker partners in an interorganizational relationship" (Iacovou et al., 1995, p. 470). To identify aspects of the environmental factors, our study utilizes the concept of institutional theory because this theory focuses on the role of environmental pressures that might drive firms to adopt innovations (Henderson et al., 2012). This theory has been used to explain the adoption of other IT innovations similar to VAT-compliant accounting systems, such as eXtensible Business Reporting Language (XBRL) (Henderson et al., 2012) and Electronic Data Interchange (EDI) (Teo et al., 2003). According to DiMaggio and Powell (1983), firms compete for resources and legitimacy—two aspects that are interrelated. By behaving appropriately, firms gain legitimacy and thus have opportunities to access resources. We identified three types of pressure: mimetic pressure and coercive pressure, as identified by DiMaggio and Powell (1983), and regulatory pressure, which has been found significant in the IT adoption literature (Kuan and Chau, 2001; Zhu and Kraemer, 2005; Zhu et al., 2006). A summary of the variables used in this study and their sources of reference are provided in Table 1.

4. Hypothesis development

A tax-compliant accounting system is one of a number of technologies that SMEs can adopt to improve their compliance with the tax system. Tax compliance is one reason SMEs adopt an accounting system (Halabi et al., 2010; Hansford et al., 2003). As discussed earlier, the TOE framework specifies the categories of factors (technological, organizational, and environmental) that are useful in understanding factors that lead to the adoption of a VAT-compliant accounting system. The TOE framework and the variables used in this study are presented in Fig. 1.

4.1. Technological factors

SMEs that adopt technology perceive that their business can improve data accuracy, speed up processes, and reduce clerical errors (Kuan and Chau, 2001). SMEs with a positive attitude toward technological factors, which are perceived compatibility, complexity, and relative advantage, are more likely to adopt information systems (Thong, 1999). "Compatibility" refers to the degree to which a VAT-compliant accounting system is compatible with existing organizational practices and procedures. Compatibility is important in the context of a VAT-compliant accounting system because it has the potential to change the business reporting chain. Prior research on other technologies similar to VAT-compliant accounting systems, such as Henderson et al. (2012); Premkumar and Roberts (1999), and Ramdani et al. (2009), found that compatibility has a significant positive effect on adoption. Adopting a VAT-compliant accounting system can introduce additional systems integration issues, whereby existing processes throughout the financial reporting chain must be modified to accommodate the taxonomy introduced by the VAT-compliant accounting system. Thus, we hypothesize:

Table 1
Summary of literature on SME IT adoption.

Type of factor	Variables used in the study	Sources
Technological	<ul style="list-style-type: none"> • Compatibility • Complexity • Relative advantage 	Henderson et al. (2012); Ramdani et al. (2009); Thong (1999); Premkumar and Roberts (1999)
Organizational	<ul style="list-style-type: none"> • Learning from external resources • Tax compliance costs 	Henderson et al. (2012); Iacovou et al. (1995); Kuan and Chau (2001); Rai and Patnayakuni (1996); Zmud (1983)
Environmental	<ul style="list-style-type: none"> • Coercive pressure • Mimetic pressure • Regulatory pressure 	Chan et al. (2012); Henderson et al. (2012); Iacovou et al. (1995); Sila (2013); Zhu and Kraemer (2005); Zhu et al. (2006); Kuan and Chau (2001); Ramdani et al. (2009)

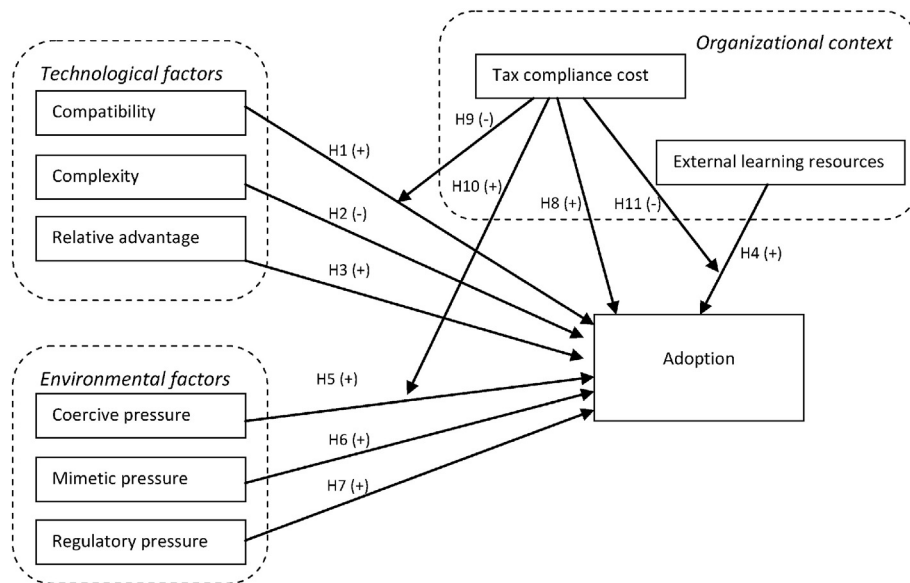


Fig. 1. The research model.

H1. Perceived compatibility has a positive influence on SMEs' adoption of VAT-compliant accounting systems.

"Complexity" refers to the degree to which the innovation is perceived as difficult to use (Rogers, 1995). The complexity of a VAT-compliant accounting system originates from system integration issues and the tagging process. The difficulty in the tagging process stems from the specialized financial knowledge required to tag each transaction according to the codes prescribed by the relevant revenue authority. Prior research has found that complexity has a negative influence on the adoption of technologies with taxonomies (Chau, 1996; Henderson et al., 2012). SMEs may struggle not only with handling the system, but also with integrating it into their business processes and organizational culture. Compared to larger organizations, SMEs have limited resources to address issues that increase the costs of tax compliance, such as the complex partial exemption VAT rules, complexity in VAT determination, and the cost of hiring an external advisor (Hansford et al., 2003). Thus, we hypothesize:

H2. Perceived complexity has a negative influence on SMEs' adoption of VAT-compliant accounting systems.

"Relative advantage" refers to the advantages, or perceived benefits, that an innovation is expected to provide to an organization (Rogers, 1995). Relative advantage is significant in explaining the adoption of other technologies similar to a VAT-compliant accounting system, such as XBRL (Henderson et al., 2012; Premkumar and Roberts, 1999; Ramdani et al., 2009). SMEs may deeply integrate the system into their financial reporting processes, which can help organizations achieve benefits such as significant cost savings, improved decision making, and transparency of financial information (Garbellotto, 2009; Hodge et al., 2004). By having a system that is deeply integrated with the financial reporting processes, day-to-day transactions can be properly tagged to the VAT codes and carry the proper documentation. With a more positive perception of the benefits of the system, SMEs are more likely to adopt a VAT-compliant accounting system. Thus, we hypothesize:

H3. Perceived relative advantage has a positive influence on SMEs' adoption of a VAT-compliant accounting system.

4.2. Organizational factors

Organizational factors are firm attributes that may influence the decision to adopt. The selection of organizational factors is derived from the organizational learning perspective proposed by Attewell (1992), which states that adoption can be facilitated by lowering knowledge barriers about an innovation through organizational learning. Attewell (1992) suggested that, to adopt a new innovation, an organization must have the expertise needed to use the technology effectively. For SMEs, employees' knowledge of information systems is a main determinant of their adoption of such system (Thong, 1999). This means that employees of SMEs must be motivated to learn about the important implications of VAT on financial transactions and ultimately the accounting information system. Tagging financial transactions in-house requires a good level of accounting knowledge because the employees must understand how to map the transactions to the appropriate elements in the VAT taxonomy. SMEs can lessen their burden by learning how to operate the system effectively from external sources. We therefore propose the following hypothesis:

H4. The perceived degree to which the organization learns from external sources has a positive influence on SMEs' adoption of a VAT-compliant accounting system.

4.3. Environmental factors

Iacovou et al. (1995) found that the strongest factor influencing SMEs' adoption of information technology is external pressures. Coercive pressures are forces exerted on organizations by other organizations upon which they depend (DiMaggio and Powell, 1983). Thus, organizations may exhibit similar adoption patterns as those organizations upon which they depend due to coercive pressures (Iacovou et al., 1995; Kuan and Chau, 2001; Sila, 2013; Teo et al., 2003). When SMEs are dependent on other VAT-registered firms, these firms can pressure the dependent SMEs to become VAT-registered. To be VAT-registered, these SMEs will need to adopt a VAT-compliant accounting system. In a supply chain, larger firms may want their dependent SMEs to be VAT-registered so that they can claim all the VAT charged by these dependent SMEs, thus lowering their operating costs. Based on these rationales, we propose the following hypothesis:

H5. Perceived coercive pressures have a positive influence on SMEs' adoption of a VAT-compliant accounting system.

Mimetic pressures lead organizations to imitate other organizations that they perceive to be successful in their industry. Mimetic pressures stem from competitive pressures and can lead to the same adoption decisions as successful rivals (DiMaggio and Powell, 1983). Teo et al. (2003) indicated that mimetic pressures manifest themselves in two ways. First, if many organizations in the same industry adopt a VAT-compliant accounting system, others in the industry will also adopt it to avoid the risk of being perceived as less innovative. Second, by mimicking competitors that succeed in their adoption of a VAT-compliant accounting system, organizations seek to follow perceived best practices to remain competitive. SMEs that do not meet the required threshold to be VAT-registered may still voluntarily be VAT-registered to convey to the public that their business is doing as well as their competitors in the industry, especially because being VAT-registered means that the business has a yearly turnover of more than RM500,000. Hence, we hypothesize:

H6. Perceived mimetic pressure has a positive influence on SMEs' adoption of a VAT-compliant accounting system.

Regulatory pressure is a significant factor in IT adoption (Kuan and Chau, 2001; Zhu et al., 2006). Regulatory pressure is included to capture pressure from regulatory authorities (e.g., the customs office) to adopt a VAT-compliant accounting system. The rationale is that a VAT-compliant accounting system is not required for non-accounting-related purposes for SMEs, such as human resources management and supplier management. Thus, the regulatory mandate may cause an organization to adopt a VAT-compliant accounting system for other purposes. Kuan and Chau (2001) found that this regulatory pressure increased adoption among SMEs because SMEs believe that they will benefit from the adoption more than the government does. Some German SMEs have found that their adoption of accounting systems for regulatory purposes, such as business law, has also been useful for preparing tax compliance reports (Eichfelder and Schorn, 2012). Hence, we hypothesize:

H7. —Perceived regulatory pressure has a positive influence on SMEs' adoption of a VAT-compliant accounting system.

4.4. The role of tax compliance costs in adopting VAT-compliant accounting systems

SMEs tend to lack the resources necessary for IT investments and use a relatively low computerization level for their operations (Evans et al., 1996; Iacovou et al., 1995; OECD, 2009, 2013). Drawing from the literature that highlights financial cost as part of the organizational factor, we hypothesize that the allocation of resources for tax compliance activities influences the adoption of a VAT-compliant accounting system. Evans et al. (1996); Hansford et al. (2003), and Halabi et al. (2010) indicated that SMEs adopt and use accounting systems for tax compliance activities, which represents a significant cost to SMEs. Thus, drawing from this rationale, we formulate the following hypothesis:

H8. Perceived tax compliance cost has a positive influence on SMEs' adoption of a VAT-compliant accounting system.

Moreover, no empirical study has examined the moderating effect of tax compliance cost in this adoption context. The relationship between adoption and the TOE variables may be stronger if tax compliance cost is considered; this indicates that tax compliance cost may have a significant moderating effect on adoption. We hypothesize that the three variables on which tax compliance costs have a significant influence are compatibility (technological construct), learning from external resources (organizational), and coercive pressure (environmental). These hypotheses are based on Evans et al. (1996); Hansford et al. (2003), and Halabi et al. (2010), who indicated that an accounting system is used mainly for tax compliance purposes. Thus, when tax compliance cost is low, its use may be related to better compatibility with organizational procedures and practices. For organizational learning from external sources, we hypothesize that a strong link to tax compliance cost exists because of SMEs' unfamiliarity with the VAT system and that SMEs face high learning costs (Rametse and Pope, 2002). Thus, if SMEs use their accounting system mostly for tax purposes, the more SMEs learn to manage compliance activities effectively through their accounting system, the fewer resources they need to spend on tax compliance matters. We also hypothesize a significant link between coercive pressure and tax compliance cost; when SMEs are highly dependent on VAT-registered firms, these SMEs incur high tax compliance costs because they need to be VAT-registered. One major tax compliance cost for these VAT-registered SMEs is a VAT-compliant accounting system and staff training in using such system. Thus, we hypothesize the following:

H9. Perceived tax compliance cost negatively moderates the relationship between perceived compatibility and SMEs' adoption of a VAT-compliant accounting system.

H10. —Perceived tax compliance cost positively moderates the relationship between perceived coercive pressure and SMEs' adoption of a VAT-compliant accounting system.

H11. —Perceived tax compliance cost negatively moderates the relationship between the perceived degree to which the organization learns from external sources and SMEs' adoption of a VAT-compliant accounting system.

5. Methods and materials

5.1. Measures

A questionnaire was developed from past studies. For technological constructs, perceived compatibility (C), complexity (CX), and relative advantage (RA) were adapted from Henderson et al. (2012). We measured perceived compatibility by asking respondents how compatible the new VAT-compliant accounting system was with the organization's existing system. Perceived complexity measures the organization's difficulty in using the system, while perceived relative advantage refers to the expected benefits of the innovation to the organization.

For the organizational construct, the items for learning from external sources (L) were adapted from Henderson et al. (2012). We asked respondents about the external sources upon which they depend to learn about the VAT-compliant accounting system. For tax compliance cost, we followed Evans et al. (1996), who identified the four major types of compliance costs as “own labour costs, costs of external advisers, computing costs and incidental costs such as specific travel, stationery, postage etc” (p.11) We asked respondents to choose a range that indicated their tax compliance costs for each major type of cost. Initially, when we piloted the study, we asked respondents to state the exact amount of each major type; however, these questions were not answered. Due to this reluctance to state the exact amount, we opted to use a range of compliance costs, which was adapted from Abdul-Jabbar and Pope (2008).

For environmental constructs, the items for mimetic pressure (MP), coercive pressure (CP), and regulatory pressure (RP) were taken from Henderson et al. (2012). We measured mimetic pressure by asking a question about the SMEs' pressure to mimic competitors and adopt a VAT-compliant accounting system. Coercive pressure was measured by asking respondents to indicate whether suppliers pressured their organization to adopt a VAT-compliant accounting system. For regulatory pressure, we asked respondents to indicate whether regulators pressured their organization to adopt a VAT-compliant accounting system.

Following Venkatesh et al. (2003), VAT-compliant system adoption (A) was operationalized through three items. Each question asked respondents to indicate the adoption status of their firm (whether they agreed or disagreed on a 5-point Likert scale, with 1 representing strongly disagree and 5 representing strongly agree).

5.2. Data collection

SMEs were randomly selected from the list provided by SME Corporation Malaysia, which is a government agency responsible for the development of SMEs in Malaysia. The list contained only SMEs that have agreed to make their company information publicly available. This list ensured that the businesses chosen for this study were SMEs. From this list, we randomly chose SMEs

Table 2
Respondents' details.

Details	Total (N = 399)	
	N	%
Main business activity		
Manufacturing (including agro-based)	51	12.9
Manufacturing-related services	77	19.5
Services	117	29.7
Construction	25	6.4
Other	124	31.5
Years in operation		
<2 years	49	12.3
2 to 5 years	138	34.7
>5 years	211	53.0
Number of employees		
4 or fewer	127	32.2
5 to 19	136	34.5
20 to 50	72	18.3
51 to 150	38	9.6
151 or more	21	5.3
Paid-up capital		
RM500,000 or less	235	59.8
RM500,001 to RM2,500,000	121	30.8
RM2,500,001 or more	37	9.4

located in Kuala Lumpur, the capital city of Malaysia, and its surrounding area, which represent >50% of the total SMEs in the list provided by SME Corporation Malaysia. To collect data, two enumerators were sent to the various business locations in Kuala Lumpur and its surrounding area, which has the greatest number of SMEs. These enumerators approached 482 randomly selected organizations. The target respondents were the company's senior officers whose scope of work included implementing VAT systems. Forty-four organizations, however, did not agree to participate, so the enumerators did not leave questionnaires with them. For those that agreed to participate, the enumerators either left the questionnaire to be collected later or met the respondents and discussed the questionnaire with them. Ultimately, 438 questionnaires were collected after four months. Of these 438 questionnaires, we discarded 37 due to a lack of data in the tax compliance cost section. Furthermore, we examined for common method bias by using Harman's one-factor test Podsakoff et al. (2003). The test revealed the presence of four distinct factors with eigenvalues >1.0, rather than a single factor. The four factors together accounted for 66% of the total variance; however, the first and largest factor did not account for a majority of the variance (36.9%). No significant biases in our dataset were due to the survey methodology.

To check for non-response bias, we compared early respondents with late respondents in terms of three key organizational characteristics of the sample: number of employees, fixed assets, and sales turnover. The rationale for this test was that late respondents were likely to have characteristics similar to non-respondents (Armstrong and Overton, 1977). The *t*-test showed no significant difference between the two groups of respondents in terms of number of employees ($t = -1.706$, $p = 0.089$), paid-up capital ($t = -1.64$, $p = 0.870$), or sales ($t = -0.959$, $p = 0.338$) at the 5% significance level, suggesting that nonresponse bias was not a problem.

Table 2 shows the SMEs' background information in terms of main business activity, years in operation, number of employees, and paid-up capital.

6. Data analysis

6.1. Analysis method

To analyze our data, we used a partial least squares (PLS) method, which employs a component-based approach for estimation purposes (Lohmoller, 1988). PLS can also simultaneously test the structural and measurement models, providing a more complete analysis. PLS also makes minimal demands on the sample size and residual distribution (Chin et al., 2003). Smart PLS and a two-step analysis approach were used to analyze the data. In addition, a bootstrapping method (5000 re-samples) was used to determine the significance levels of the loadings, weights, and path coefficients.

6.2. Measurement model

The measurement model was assessed for the total sample. We dropped one item, L3 (learning from external resources), as it had composite reliability values <0.5. We had four single-item constructs: perceived coercive pressure (CP), perceived complexity (CX), perceived mimetic pressure (MP), and tax compliance cost (TCC). Apart from these single-item constructs, all constructs in

Table 3
Reliabilities.

Construct	Number of items	Cronbach's α	Composite reliability	Ave
Compatibility (C)	2	0.885	0.946	0.897
Learning from external sources (L)	3	0.842	0.904	0.759
Regulatory pressure (RP)	2	0.709	0.873	0.775
Relative advantage (RA)	2	0.830	0.899	0.747
Adoption (A)	3	0.825	0.895	0.741

Table 4
Item loadings and cross-loadings.

	Compatibility (C)	Learning from external sources (L)	Regulatory pressure (RP)	Relative advantage (RA)	Adoption (A)
C1	0.942	0.151	0.484	0.566	0.484
C2	0.952	0.201	0.514	0.653	0.532
L1	0.125	0.836	0.322	0.263	0.266
L2	0.188	0.913	0.357	0.319	0.367
L4	0.168	0.864	0.344	0.298	0.337
RP1	0.460	0.435	0.880	0.478	0.585
RP2	0.469	0.256	0.881	0.476	0.587
RA1	0.555	0.287	0.454	0.875	0.483
RA2	0.520	0.350	0.478	0.888	0.513
RA3	0.599	0.239	0.471	0.828	0.499
A1	0.512	0.269	0.607	0.550	0.878
A2	0.529	0.273	0.637	0.500	0.882
A3	0.336	0.443	0.465	0.436	0.821

Note: Values in bold indicate items loadings.

Table 5
Latent variable correlations.

Construct	CP	C	CX	L	MP	RP	RA	TCC	A
Coercive pressure (CP)	Single-item construct								
Compatibility (C)	0.389	0.947							
Complexity (CX)	0.364	0.187	Single-item construct						
Learning from external sources (L)	0.426	0.364	0.195	0.871					
Mimetic pressure (MP)	0.577	0.528	0.298	0.480	Single-item construct				
Regulatory pressure (RP)	0.637	0.645	0.385	0.392	0.596	0.880			
Relative advantage (RA)	0.536	−0.029	0.519	0.339	0.459	0.542	0.864		
Tax compliance cost (TCC)	−0.041	0.538	−0.146	0.013	0.003	0.066	−0.133	Single-item construct	
Adoption (A)	0.551	0.450	0.283	0.376	0.642	0.666	0.577	0.054	0.860

Note: Diagonals (in boldface) represent the square root of average variance extracted while the other entries represent the correlations; single-item constructs were excluded from this table.

the model satisfied the requirements for reliability (see Table 3). All composite reliability values were >0.70 . We also examined the discriminant and convergent validity of each indicator (Chin, 1998). To be discriminant and convergent, each indicator should load higher on the construct of interest than on any other latent variable (see Table 4). Discriminant validity is also satisfied if the average variance extracted (AVE) for all constructs is >0.50 and the square root of AVE is greater than each correlation coefficient (see Table 5).

6.3. Structural model

To evaluate the structural models' predictive power, we calculated the standardized coefficient (β), which specifies the strength of the relationship between two constructs, and the R^2 for the adoption of a VAT-compliant system, which indicates the amount of variance explained by the exogenous variables (Hair et al., 2013). In addition, by applying a variance inflation factor (VIF), a multicollinearity test was used to determine whether the correlation among exogenous variables in the TOE framework existed in the research model. The results show that the VIF values for all exogenous variables were <10 , which means that multicollinearity was not a major problem in this study. We ran two separate models to test the support for direct effects only and direct with moderated effects. Table 6 reports the results for predicting adoption of a VAT-compliant accounting system under both models. Fig. 2 shows the standardized path coefficients of the variables, their respective significance levels, and the variances explained for the direct and moderated effects model.

In Fig. 2, the PLS results for the model suggest that all hypotheses except H4, H5, and H8 were supported. All technological factors (perceived compatibility, complexity, relative advantage) had an effect on adoption of a VAT-compliant accounting system. The path coefficient from perceived compatibility to VAT-compliant accounting system adoption was 0.165 (significant at $p < 0.01$). Moreover, perceived complexity had a significantly negative effect on VAT-compliant accounting system adoption ($\beta = -0.106$, $p < 0.05$) while perceived relative advantage had a significantly positive effect with a path coefficient ($\beta = 0.207$, $p < 0.001$). The results provide support for H1, H2, and H3. For the construct in the organizational factor, the perceived degree to which the organization learns from external sources had no effect on VAT-compliant accounting system adoption, suggesting that learning from external sources has no influence on adoption of a VAT-compliant accounting system ($\beta = 0.028$, $p = 0.433$). The result provides no support for H4.

For environmental factors, H5, H6, and H7 predicted positive relationships between the variables of environmental factors (perceived coercive, mimetic, and regulatory pressure) and VAT-compliant accounting system adoption. Perceived coercive

Table 6
Structural model results.

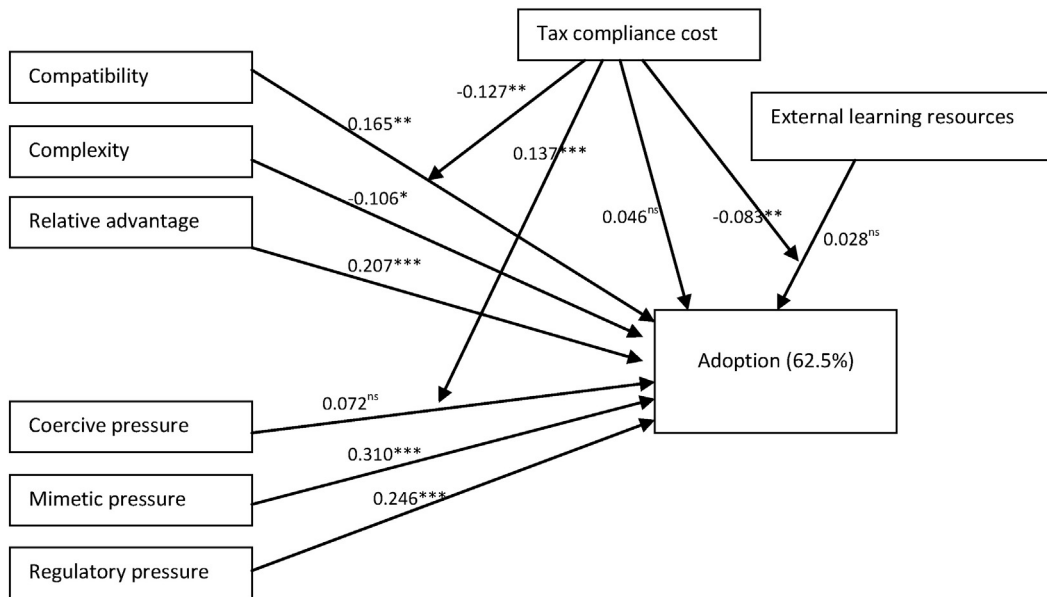
	Direct effects only	Direct and moderated effects
R^2	0.604	0.625
Adjusted R^2	0.596	0.614
Compatibility(C)	0.177**	0.165**
Complexity (CX)	−0.116*	−0.106*
Relative advantage (RA)	0.201***	0.207***
Learning from external resources (L)	0.013	0.028
Coercive pressure (CP)	0.054	0.072
Mimetic pressure (MP)	0.318***	0.310***
Regulatory pressure (RP)	0.276***	0.246***
Tax compliance cost (TCC)	0.052	0.046
$C \times TCC$	–	−0.127**
$C \times CP$	–	−0.137***
$C \times L$	–	−0.083**

Note: ns = not significant.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.



Note: ns = not significant, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Fig. 2. Results for structural model.

pressure had no significantly positive effect on VAT-compliant accounting system adoption ($\beta = 0.072$, $p = 0.190$), rejecting H5. This implies that the respondents' perception of coercive pressure such as pressure from trading or business partners had no significant effect on adoption of a VAT-compliant accounting system. The path coefficient from the perceived mimetic pressure to VAT-compliant accounting system adoption was 0.310 and significant at $p < 0.001$, supporting H6. In addition, the path coefficient from perceived regulatory pressure to VAT-compliant accounting system adoption was 0.246 and significant at $p < 0.001$, supporting H7.

For tax compliance cost, which we categorized as an organizational factor, the results showed no significant influence on adoption of a VAT-compliant accounting system ($\beta = 0.046$, $p = 0.142$), thereby rejecting H8. The moderating effect of tax compliance cost was also examined by testing the effect of the interaction terms on perceived compatibility, perceived coercive pressure, and learning from external sources through H9, H10, and H11. The results showed that tax compliance cost had significant moderating effects on all hypothesized relationships. The path coefficients for H9, H10, and H11 were -0.127 ($p < 0.01$), -0.137 ($p < 0.001$), and -0.083 ($p < 0.01$), respectively, supporting these hypotheses. These results imply that tax compliance cost does not directly affect adoption of a VAT-compliant accounting system but rather facilitates the relationships between perceived compatibility, perceived coercive pressure, and learning from external sources and adoption of a VAT-compliant accounting system. Thus, when SMEs perceive better compatibility and learn from external sources, the extent to which they adopt a VAT-compliant accounting system can increase while decreasing their tax compliance cost. In addition, as SMEs perceive stronger coercive pressure from their trading partners, the extent to which they adopt a VAT-compliant accounting system can increase along with their tax compliance cost.

The variance in VAT-compliant accounting system adoption with direct effects only and direct effects with moderated effects was good at 60.4% and 62.5%, respectively. To examine the effect size of moderation, we used f^2 (Sánchez-Franco, 2006). The average effects size in tests of moderation was only 0.009 (Aguinis et al., 2005); thus, we followed the effect sizes of 0.005, 0.01, and 0.025 for small, medium, and large, respectively (Kenny, 2015). The moderator variables' effect size ranged between medium and large.

7. Discussion

Consistent with prior literature on SMEs' IT adoption (Iacovou et al., 1995; Kuan and Chau, 2001; Premkumar and Roberts, 1999; Thong, 1999), the empirical results of this study support the underlying concept that constructs in the TOE framework are directly useful for explaining the factors behind adoption of a VAT-compliant accounting system. Furthermore, tax compliance cost plays an important role as an enhancing factor in the relationships between the TOE factors and VAT-compliant accounting system adoption.

All three technological factors have a significant positive influence on VAT-compliant accounting system adoption, thereby supporting H1, H2, and H3. The significance of the technological factors for the adoption of this system is consistent with the idea that SMEs can only achieve greater benefit from IT systems after modifications to existing systems and processes. H1 assessed

the relationship between comparability and VAT-compliant accounting system adoption, while H2 tested the relationship between complexity and VAT-compliant accounting system adoption. Both hypotheses were supported, implying that SMEs need to deal with system integration issues to accommodate a VAT-compliant accounting system. These findings are consistent with studies on SMEs' IT adoption such as Premkumar and Roberts (1999) and Thong (1999). H3 proposed a positive relationship between relative advantage and VAT-compliant accounting system adoption. This hypothesis was supported, suggesting that SMEs adopt a VAT-compliant system if they perceive the need for the technology to overcome a challenge or to exploit a business opportunity. Results also suggest that relative advantage has the strongest influence among other technological factors, which is consistent with prior studies such as Premkumar and Roberts (1999) and Thong (1999), who found that this factor significantly influenced SMEs' IT adoption.

Although prior research on IT adoption (Henderson et al., 2012; Rai and Patnayakuni, 1996) has emphasized the importance of learning from external resources, our results indicate that learning from external resources does not have a significant influence on SMEs' adoption of a VAT-compliant accounting system, thereby rejecting H4. This result is surprising given the complexity involved in tagging an organization's chart of accounts to the appropriate VAT codes as well as the potential complexity surrounding systems integration issues. A close inspection of the items for this construct provides insights into this result. Several of the items refer to learning about VAT-compliant accounting systems from sources such as seminars, workshops, and system vendor representatives. These resources were inserted in the questionnaire due to their availability in the Malaysian market to educate businesses on various VAT requirements in Malaysia. However, the SMEs in the sample may not have extensively learned about VAT-compliant accounting system adoption from these external sources; this is concerning as it is unclear whether this is due to SMEs actually growing through learning or whether they are less likely to learn from these external sources. Future research should further explore the potential significance of learning for high-growth SMEs and the medium that they use to facilitate their growth.

Hypotheses 5, 6, and 7 assessed the relationship between environmental factors (i.e., perceived coercive, mimetic, and regulatory pressures) and VAT-compliant accounting system adoption. The results indicate that perceived coercive pressure (H5) had no significantly positive effect on VAT-compliant accounting system adoption, whereas the perceived mimetic pressure (H6) and perceived regulatory pressure (H7) did. These results provide support for institutional theory, as only perceived coercive pressure is not significant in explaining VAT-compliant accounting system adoption. This result seems contradictory as it is natural to assume that firms adopt IT systems partly due to pressure from trading partners (Iacovou et al., 1995), as some are not required to do so by regulatory law. Our sample showed that >50% of our firms have turnover less than RM500,000, which means that they are less likely to be VAT-registered and thus less likely to need a VAT-compliant accounting system. However, perceived mimetic and regulatory pressures are important influences for VAT-compliant accounting system adoption—a finding similar to that of Kuan and Chau (2001). The results also suggest that perceived mimetic pressure has the strongest influence on VAT-compliant accounting system adoption for SMEs. These SMEs might see the adoption of a VAT-compliant accounting system as an industry trend, a socially acceptable business practice, and thus a necessity (Premkumar and Roberts, 1999). Perceived government pressure is important for the adoption of a VAT-compliant accounting system, and this pressure may come from SMEs that are VAT-registered. As discussed earlier, the sample showed that most of the respondents are unlikely to be VAT-registered, but the perceived regulatory pressure is a strong factor. One possible explanation is that, in the context of a developing country such as Malaysia, government regulation is more important for e-business assimilation (Zhu et al., 2006). SMEs may also use the accounting system for other mandated requirements, such as the annual filing of a business's financial statements with the registrar of businesses or companies.

Finally, tax compliance cost is not a factor in adoption of a VAT-compliant accounting system, but it moderates the relationships between perceived comparability, perceived coercive pressure, and learning from external sources and VAT-compliant accounting system adoption. This somewhat contradicts finding in prior literature (Halabi et al., 2010; Marriott and Marriott, 2000) that SMEs use accounting systems mainly for tax filing requirements. This research suggests that tax compliance is not a major factor in the decision to adopt a VAT-compliant accounting system for SMEs. There are two possible explanations for this contradictory result. First, our study examines the initial phase of VAT implementation in Malaysia. In this initial phase, SMEs are still learning and adjusting to VAT requirements. They need to understand how VAT affects not only their accounting processes but also their costing and pricing strategies. Prior studies such as Halabi et al. (2010) and Marriott and Marriott (2000) were conducted when VAT was a well-established tax in the country of study. Second, the introduction of VAT may also mean that many SMEs in our studies are first-time adopters of an accounting system. At this initial adoption stage, these SMEs may not fully comprehend how the VAT-compliant accounting system can benefit them from the tax perspectives or they may still be too involved in settling integration issues to notice the full benefits, particularly from the tax point of view, that accrue from adoption of the system to their business processes.

Nevertheless, our study found that tax compliance cost functions as a moderator. Learning from external resources and perceived coercive pressure had no significant relationship with VAT-compliant accounting system adoption. However, with the presence of tax compliance cost, these relationships become significant. Because of the need to comply with the VAT requirements to tag and file, tax compliance cost is likely to affect adoption of a VAT-compliant accounting system; such cost serves as a moderator that facilitates learning from external resources and perceived coercive pressure. This means that SMEs will only begin to learn from external resources when they are motivated to reduce their tax compliance costs. This result is consistent with Hansford et al. (2003), suggesting that educating SMEs about VAT is warranted to improve compliance. Our study suggests that such education influences the adoption of a VAT-compliant accounting system. In addition, perceived coercive pressure only comes into play when there is a tax compliance cost, which may indicate that, when trading partners are VAT-registered, SMEs are pressured to become VAT-registered as well, thereby identifying the need to adopt a VAT-compliant accounting system.

7.1. Research implications

This study's results have important theoretical implications. Previous studies of IT adoption decisions have generally focused on how the accounting processes, such as the recording, communicating, and reporting of financial transactions, have affected IT and vice versa. Thus, there is a need to further our understanding of whether taxation processes influence information technology or vice versa. Prior literature has shown that organizations, particularly SMEs, mostly use their accounting systems for tax compliance activities, such as tax-related calculations and tax filing. This study contributes to the literature by providing a better understanding of how tax compliance activities, measured through their costs, influence the IT adoption process. The proposed model fills a gap in the literature by investigating the significance of tax compliance activities to SME owners' and managers' psychological and behavioral outcomes in adoption decisions during the early stage of implementing a tax.

In addition, this study has empirically measured the relative importance of tax compliance activities in the context of accounting system adoption. Our research model clearly describes the adoption factors that are important for a tax-compliant accounting system, and our study reveals the moderating effect of tax compliance cost on the adoption of this system. This model thus provides a new theoretical foundation for future research because it extends the work of scholars such as [Eichfelder and Schorn \(2012\)](#); [Guyton et al. \(2005\)](#); [Hansford et al. \(2003\)](#), and [Evans et al. \(1996\)](#) by examining how tax compliance costs factor into the IT adoption model through the TOE framework.

Second, the TOE framework has been used to explain organizational innovation in various contexts, but not in the context of SMEs' accounting system adoption in the initial phase of adoption. The proposed model incorporates various factors of the TOE framework to explain organizational adoption behaviors of SMEs associated with a newly introduced IT system: a VAT-compliant accounting system.

7.2. Policy implications

The results also provide practitioners with important insights by highlighting the benefits that SMEs derive through a better understanding of the adoption of a tax-compliant accounting system, particularly the role of tax compliance costs. SMEs with little or no knowledge of a tax-compliant accounting system can gain a deeper understanding of the factors that are important for its adoption and use the system to provide the optimum benefit. In particular, SMEs should educate themselves through external sources such as workshops and seminars not only to lessen their tax compliance costs, but also to improve their use of the accounting system in the early stages of adoption.

Furthermore, SMEs with a solid understanding of the factors influencing the adoption of a tax-compliant accounting system are better positioned to move their organizations away from indifference to IT and toward a full integration of the accounting system into their daily operations. In addition, managers are also in a better position to utilize their accounting system if they have a clear understanding of the influence of tax compliance costs in the use of such system; they can focus on the factors that are important for reducing tax compliance cost and simultaneously encourage IT adoption. Such knowledge offers a competitive edge, especially considering that tax compliance costs are a major issue for SMEs. Finally, accounting system initiators and advocates such as the government and vendors should also devise strategies that enhance accounting systems not only as a managerial and financial reporting tool for SMEs, but also as a tool that facilitates tax filing requirements.

8. Conclusion

Our study attempts to offer a better understanding of the adoption of a tax-compliant accounting system, particularly the role of tax compliance costs in this type of IT adoption. Our study focused on SMEs in Malaysia and the requirements of the VAT system in Malaysia. Although our study's model may apply to firms in other regions, we cannot confirm that the results will be similar. However, despite these limitations, we believe that our study makes several contributions to the field of IT adoption.

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