Designing a Model of the Factors Affecting Tax professionals' Tax noncompliant behaviour using The ISM Approach

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Abstract

The purpose of this study is to determine the factors affecting Tax professionals' tax noncompliant behavior by using interpretive structural modelling method. Based on a comprehensive literature review and on the perception of 30 Tax professionals in Iran, five factors were identified to explain the Tax professionals' tax noncompliant behavior: age, gender, tax knowledge, legislative tax complexity, and compliance tax complexity. The results of the interpretive structural modelling method showed that age and gender were the most influencing factors in the field of Tax professionals' tax noncompliant behavior.

Keywords Interpretation Structural Modelling · Tax noncompliance · Tax professionals

Introduction

Tax noncompliance takes place in all societies and economic systems including both developed and developing countries. According to a report from the WIDER—World Institute for Development Economics Research (Cobham & Jansky, 2018), US \$500 billion in global revenue is lost because of tax avoidance. Building on a previous study performed by International Monetary Fund researchers (Crivelli et al., 2016), the WIDER's report offers two different perspectives: overall loss estimates, and losses as a percentage of GDP (gross domestic product). In terms

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of overall losses, The United States occupy the first place, with estimated losses at US \$188 billion every year, with China in a distant second place with US \$66.8 billion of losses per year. But the report emphasizes the significance of the losses as a percentage of GDP: in that perspective, the greatest intensity of losses occurs in low-income and lower-middle-income countries, as well as across sub-Saharan Africa, Latin America, Caribbean, and South Asia. In contrast, for the United States and China the losses as a percentage of GDP only represent, respectively, 1.13 and 0.75 percent.

In this context of massive revenue losses, tax noncompliance assumes the role of an universal problem. The increase in tax noncompliance and its effects on tax collection and government revenue have attracted the special attention of academics, policy makers and international non-governmental organizations such as the World Bank and the Organization for Economic Co-operation and Development (OECD).

Therefore, due to the importance of tax revenue in providing revenue sources for countries (Nurlis, 2015; Saad, 2014), several studies have been done on tax compliance, however, in the context of tax noncompliance, many questions remain to be answered. In this context, this research seeks to answer the following questions: What are the most important factors influencing the explanation of Tax professionals' tax noncompliant behavior? What is their hierarchical conceptual model?

Lopes (2008) and Borrego (2015) argue that the activities of tax professionals can play an important role in designing a country's tax policy. Therefore, it is useful for tax policy to be investigated the profile of tax professionals and their relationship to tax compliance.

By collecting data based on the literature review performed and on the perception of Tax professional, the main factors have been identified for the present investigation. Then, using the interpretive structural modelling method, the final interpretation model was achieved, and the results presented.

In addition to this introduction, the article is organized as follows: the Sect. 2 presents the Literature review and the Theoretical framework on tax noncompliance. Section 3 describes the ISM-based research methodology. Section 4 presents the results of the ISM Interpretive Structural Modelling for Levelling and Determining Key Criteria affecting Tax professionals' tax noncompliant behavior. Section 5 discusses the research findings. Finally, conclusions and limitations will be identified in last section.

Literature Review and Theoretical Framework

Concepts of Tax Noncompliance

Although there is extensive literature on the drivers of tax (non)compliance, there is no standard all-embracing or agreement among tax researchers on a universal definition of tax (non)compliance. Some studies (Brown & Mazur, 2002; Devos, 2005; Gilligan & Richardson, 2005; Slemrod, 2007; Ho & Wong, 2008; Kirchler et al., 2008; Kastlunger et al., 2010) use several theories from psychology or econometric domains to explore the concept of tax compliance, but they do not clearly define the

concept. As Devos (2005: 223) pointed out, “there is no standard all-embracing definition of tax (non)compliance adopted across all tax compliance studies”. Slemrod (2007) agrees with Devos (2005) and states that the main reason for this lack of consensus is the use of several concepts with different meanings such as “misreporting”, “noncompliance”, “evasion” and “tax gap”.

This study adopted the compliance obligations as defined by OECD (2008), which contend that tax compliance include: (i) registering for tax purposes; (ii) filling tax returns on time; (iii) disclosing all taxable income and making a proper claim for deductions on the tax return; and (iv) paying the assessed tax by due dates. According to definition of the OECD (2008), it can be stated that tax noncompliance includes all the intentional or unintentional schemes or activities to reduce, to avoid or to defer the payment of taxes.

Theoretical Framework on Tax Noncompliance

The first studies on noncompliance with simple economic models started in the 1970s regard tax (non)compliant behavior. The first and most well-known model is the Tax Evasion Standard Model (also, known as the traditional theory of tax evasion and A-S theory) based on Becker’s theory of crime (1968), which was first introduced by Allingham and Sandmo (1972). This model only uses econometric variables («actual income— W »; «tax rate— θ »; «declared Income— X »; «the probability that the taxpayer will be subject to investigation by tax authorities— p »; «penalty rate— π »). In this model, two variables—probability of audits and severity of punishment—were introduced as a main deterrent to noncompliant behavior.

Although the A-S theory helps to understand tax noncompliance behavior, that was criticized by many researchers such as Cullis & Lewis (1997); Graetz and Wilde. (1985); Feld and Frey. (2007). Critics of the A-S theory have argued that it is too restrictive to explain the complexity of tax evasion in the social and global contexts. In this scope, the Psychological and Sociological Tax Models were emerged, which are based on the traditional theory of tax evasion, updating it with Social and psychological variables (Alm et al., 1992a, 1992b; Andrei et al., 2014; Feld & Frey, 2007; Fischer et al., 1992; Spicer & Becker, 1980).

For instance, Spicer and Becker (1980) concluded that the feeling of inequity increases tax noncompliance. Jackson and Milliron (1986), in review of 43 tax compliance studies undertaken from 1974 to 1985, identified fourteen key variables of compliant behavior, which include: age; gender; education; income level; income source; occupation; peer influence; ethics; fairness; complexity; tax authority contact; probability of being detected; and tax rates.

In the following decade, these factors were categorized by Fischer et al. (1992), in «Fischer Model», into 4 groups: (i) demographic (e.g.: age, gender and education) (ii) noncompliance opportunity (e.g. income level, income source and occupation), (iii) attitudes and perceptions (e.g. fairness of the tax system and peer influence) and (iv) tax system/structure (e.g. complexity of the tax system, probability of detection and penalties and tax rates). Moreover, OECD (2008) identified five determinants of

tax (non)compliance, namely: deterrence, norms (personal and social), opportunity (to comply or not comply), fairness, and trust and interactions (how the other variables interact with each other).

Also new Research in the field of fiscal sociology, especially studies on tax morale, has been developed. For example, Alm et al., (1992a, 1992b) and Torgler, (2004, 2006a, 2006b) explain that the main reason for taxpayers to tax compliance is their tax morale (the intrinsic motivation to pay taxes).

The explanatory theories of tax noncompliance initially emerged to explain taxpayers' behavior, however, in many countries, tax professional have gradually replaced taxpayers in implementing their tax decision-making process, as a result, the equation between tax authorities and taxpayers has changed and a new player has been added to the equation: Tax professional (OECD, 2008; Laffer et al., 2011; Devos, 2012). The perception of this gap in research on tax noncompliance led to the emergence of studies that extend the application of explanatory theories of tax noncompliance to tax professionals (Ayres et al., 1989; Borrego, 2015; Borrego et al., 2015, 2017; Klepper et al., 1991; O'Donnell et al., 2005).

After defining the concept of tax noncompliance and its theoretical framework, in the following, the factors affecting Tax professionals' tax non-compliance behavior are described.

Tax Professionals' Tax Noncompliant Behavior

Age, Gender and Tax professionals' tax noncompliant behavior

The literature presents almost an absence of the theme of gender and age in the context of the role of tax professionals in tax noncompliance context. Nevertheless, many Studies have explained the difference between age and gender in taxpayers' (non)compliant behavior and most of studies conclude that old taxpayers are more compliant than youngest, and women are more compliant than men (Vogel, 1979; Spicer & Becker, 1980; Spicer & Hero, 1985; Feinstein, 1991; Klepper et al., 1991; Andreoni et al., 1998; Schuetze, 2002; Torgler, 2006a, 2006b; Chung & Trivedi, 2003; Torgler & Valev, 2010; Kastlunger et al., 2010).

This difference can be explained mainly by the following factors: women overestimate the probability of detection and punishment in an audit (Hasseldine, 1999), tax morale is higher in women (Torgler & Schneider, 2004), and the propensity for risk is lower in women (Kastlunger et al., 2010).

The impact of age and gender in the context of the role of professionals in tax noncompliance, as far as we know, has only been studied by Borrego et al., (2015, 2017), who explicitly studied differences between male and female in tax professionals in tax noncompliant behavior (about the Portuguese case). Borrego et al., (2015, 2017) found younger women have a high propensity for intentional tax noncompliance. Thus, the authors also verified the existence of a great difference regarding gender, between the posture of taxpayers and professionals, in this context. Borrego et al., (2015, 2017) presented the following justification for the more aggressive posture (in the context of tax noncompliance) of women who exercise this profession:

young woman are more exposed to pressures from clients and employers; moreover, because they are young, it is possible that many holding their first professional position are thus more apprehensive about losing their jobs or clients.

The Perception of Tax Complexity and Tax Professionals' Tax Noncompliant Behavior

The perception of tax complexity is a mental concept because anyone has his/her own perception (McKerchar, 2007; Slemrod & Bakija, 2008). Despite that, it is possible to distinguish two different dimensions of tax complexity: (i) tax complexity as an objective concept (*e.g.* the number of pages of tax codes, the dimension of a tax code (number of articles) and the number of words of each article); (ii) its perception as a mental concept. For example, the study by Erich et al. (2006) showed that tax complexity led taxpayers to a negative perception of the tax system and consequently encouraged their unwillingness to tax complying.

In tax compliance literature, tax complexity can take many forms. For instance: computational complexity (American Institute of Certified Public Accountants, 1992), rule complexity, compliance complexity (Carnes & Cuccia, 1996), procedural complexity (Cox & Eger, 2006), and the low level of readability (Pau et al., 2007; Saw & Sawyer, 2010).

According to Gammie (1996), Lopes (2012) and Hoppe et al. (2019) the two dimensions of tax complexity: legislative tax complexity and compliance tax complexity are two main problems of the current tax systems.

Long and Swingen (1987), McKerchar (2005), McKerchar et al. (2005) have developed studies where they demonstrate that the Legislative tax complexity is related to the problems of tax law readability, as well as the structure of the tax system and mainly is encompassing «Ambiguity», «Change» and «the excessive number of rules». Compliance complexity is related to the complexity of the declarative and administrative component and mainly is encompassing «Computations», «Record keeping» and «tax forms». Literature, also, suggests that tax complexity is one of the determinants in the tax noncompliant behavior in taxpayers and tax professionals' scope. Bloomquist et al. (2007), Laffer et al. (2011), Collier et al. (2018) and Eric et al. (2019) refer clearly that tax complexity provides opportunities for tax noncompliance. In addition, tax knowledge is an effective factor in the perception of tax complexity and Tax professionals' tax noncompliant behavior. The next section describes this subject.

Tax Knowledge and Tax Professionals' Tax Noncompliant Behavior

The studies examining the association between tax complexity and tax (non)compliant behavior have been sparse and they provided contradictory evidence. However, in all studies tax knowledge is a key factor in the perception of tax complexity and in tax professionals' tax (non)compliant behavior.

The results of those studies show that the influence of tax knowledge on tax compliance can be either positive or negative or a combination of both. The three possibilities are outlined below:

Positive: O'Donnell et al. (2005) conclude that tax professionals use their high level of tax knowledge to deal with tax complexity to comply more. Moreover, a higher level of tax knowledge gives tax professionals a greater perception of the probability of detention and punishment for taxpayers and for themselves.

Negative: Authors such as Ayres et al. (1989), Reckers et al. (1991) and Newberry et al. (1993) argue that professionals use their high level of tax knowledge to deal with tax complexity in favor of their customers or employers' tax savings that can result in more clients' /employers' tax noncompliance.

Combine: Another group of studies detected the two types of relation: positive and negative relationships between tax knowledge, tax professionals' tax aggressiveness and the levels of tax complexity. Authors such Klepper and Nagin (1989), Klepper et al. (1991), Hite and McGill (1992), Erard (1993) and Stephenson (2007) argue that tax professionals can have flexible attitudes towards tax compliance, depending on the level of tax complexity. Therefore, tax professionals take a positive attitude towards tax compliance when tax cases are not complex and ambiguous, however, when tax law gives rise to ambiguous interpretations, professionals tend to make use of their tax knowledge around that ambiguity in favor of their customers/clients' tax savings.

To sum up, tax professionals can have two kinds of approaches (positive or negative) to compliance.

in tax complexity environments. Although five decades have passed since most of these studies were conducted, due to the importance of the activities of tax professionals in tax systems and the low processing of scientific studies on the tax professionals' role in the tax system, the topic remains relevant. In this scope, Borrego et al. (2015) argue that the activities of tax professionals can play an important role in designing a country's tax policy.

Methodology

The present work uses a mix method to collect data. Information is collected by using literature analysis and a survey.

First, the literature was reviewed to identify the Factors Affecting the Tax professionals' tax non-compliant behavior and to define the Psychological and Sociological Tax Models as the theoretical framework for this research. Secondly, a series of semi-structured interviews were conducted with a team of experts, to confirm or remove the specified factors identified in the previous steep. A questionnaire was designed to enquire the experts about the effect of the affecting factors for Tax professionals' tax non-compliant behavior on each other and their overall impact. Finally, the degree of dependency of each value was determined. The outputs of this process are graphs that show the importance of values, their interdependence, and the driving force of each value for Tax professionals' tax noncompliant behavior (Raj et al., 2008).

In this study, interpretive structural modelling (ISM) method was used to achieve the research goal. The ISM was built as a communication tool for complex situations.

ISM is an interactive learning process that was first introduced by Warfield (1974). This is one of the methods of system designing especially for economic and social systems. In the model, the set of interrelated elements are structured into a comprehensive systematic model (Warfield, 1974). The main idea of ISM is to use the experts' experience and knowledge to break down a complex system into multiple systems (elements) and build a multi-level structural model. The ISM method helps to create order and direction in the complex relationships between elements of a system (Warfield, 1974). One of the core assumptions of this approach is that the elements with broader effects on other elements of the system having higher importance (Raj et al., 2008).

Figure 1 shows the research method used in this study. The results of its application are discussed in the following sections.

Interpretive Structural Modelling (ISM)

To perform the ISM methodology, two main stages should be accomplished:

1. Building the hierarchical relationship
2. Analysing using MICMAC (Cross-Impact Matrix Multiplication Applied to Classification).

In the first stage, a simple notion of graph theory is used to depict and explain the inter-relationship among the factors and drivers. To develop this hierarchical relationship several steps should be taken as follows (Kannan et al., 2009; Eswarlal et al., 2011).

Step 1: Factors (criteria) considered for the system under consideration are listed.

Step 2: From the factors identified in step1, a contextual relationship is established among factors to identify which pairs of factors should be examined.

Step 3: A structural self-interaction matrixes (SSIM) is developed for factors, indicating pair-wise relationships among the factors of the system under consideration.

Step 4: A reachability matrix is developed from SSIM, and the matrix is checked for transitivity. The transitivity of contextual relations is a basic assumption in ISM. It states that if variable A is related to B and B to C, then A is necessarily related to C.

Step 5: The reachability matrix obtained in step 4 is partitioned into different levels.

Step 6: Based on relationships stated in the reachability matrix, a directed graph is drawn, and transitive links removed.

Step 7: The resultant digraph is converted into ISM by replacing variable nodes with statements.

Fig. 1 Methodology of ISM approach

Step 8: The ISM model developed in step 7 is checked for conceptual inconsistencies, and necessary modifications are made.

The several steps are shown in Fig. 2.

Questionnaire Development

The ISM methodology suggests the use of the expert opinions based on several management techniques such as brain storming, nominal technique, questionnaire, etc., in developing the contextual relationship among the variables (Mathiyazhag et al., 2013).

In this study, to analyse the effective factors in the explanation of «Tax professionals' tax noncompliant behavior», 5 factors were identified in literature review. In

Fig. 2 Flow diagram for preparing the ISM model. Source: Adapted from Kannan et al. (2009)

order to collect data, we used a survey of Tax professional in Iran. The questionnaire was distributed among active Tax professional in 2020 and 2021. It should be noted that due to the spread of Covid-19, it was not possible to distribute the questionnaires in person. Instead, we searched tax groups through virtual media such as Telegram and Instagram. Then, we connected online with Tax professional. It is important to emphasize that in this questionnaire, we contacted professionals to conduct their assessment in relation to the research topic. Respondents included a number of members of the Tax Affairs Organization Council, tax auditors and tax advisors.

To obtain Tax professional perception about the topic under review, a questionnaire was sent to 40 Tax professional. 30 of them completed and send the questionnaire back.

Results

Results from Data Collection

In this study for identifying the underlying relationship between the effective factors in the Tax professionals' tax noncompliant behavior were used the perspective of 30 experts familiar with the concepts of tax noncompliance.

The factors identified in literature review and ratified by experts are shown in Table 1.

Structural Self-Learning Matrix

Considering the relationship based on the contextual relationship for each variable, the existence of a relationship between two factors (i, j) and its related relationships is questioned. Four symbols are used to indicate the relationship among factors (i, j).

- V: Factors i will help achieve factor j ;
- A: Factors j will help achieve factor i ;
- X: Factors i and j will help achieve each other; and.
- O: Factors i and j are unrelated.

The matrix obtain is shown in Table 2.

Initial Reachability Matrix

At this stage, the reachability matrix of the SSIM is developed. This SSIM format is initially converted to an initial access matrix. The format is initialized by converting the information of each SSIM cell into a binary digit (one or zero). This transformation is done by the following rules:

- A. If cell (i, j) is represented by the symbol V in the SSIM matrix, cell (i, j) is 1 and cell (j, i) is zero in the initial reachability matrix.
- B. If cell (i, j) in the SSIM matrix is denoted by A, in the initial reachability matrix, cell (i, j) becomes 0 and cell (j, i) becomes 1.
- C. If cell (i, j) in the SSIM matrix is symbolized X, in the initial reachability matrix, cell (i, j) takes number 1 and cell (j, i) takes number.
- D. If cell (i, j) in the SSIM matrix has the symbol O, in the initial reachability matrix, cell (i, j) gets 0 and cell (j, i) gets 0.

According to these rules, the initial reachability matrix obtain is listed in Table 3.

After the initial reachability matrix is obtained by entering transferability based on the variables' relationships, the final accessibility matrix is obtained. This is a square matrix with each of its rij , the element of ri with element of rj have accessibility of any length, otherwise it is equal to 0.

The final reachability matrix for the factors is shown in Table 4.

Table 1 Factors Affecting the Tax professionals' tax noncompliant behavior

Row	Factors	Source
1	Age	Borrego et al., (2015, 2017)
2	Gender	Borrego et al., (2015, 2017)
3	Tax knowledge	O'Donnell et al. (2005) Ayres et al. (1989b); Reckers et al. (1991); Newberry et al. (1993); Klepper and Nagin (1989b); Klepper et al. (1991); Hite and McGill (1992); Erard (1993); Stephenson (2007)
4	Perception of legislative tax complexity	Long and Swingen (1987); Gammie (1996); McKerchar (2005); McKerchar et al. (2005) Erich et al. (2006); Bloomquist et al. (2007); Laffer et al. (2011); Lopes (2012)
5	Perception of compliance tax complexity	Long and Swingen (1987); Gammie (1996); McKerchar (2005); McKerchar et al. (2005); Erich et al. (2006); Bloomquist et al. (2007); Laffer et al. (2011); Lopes (2012)

Table 2 The Structural Self-Interaction Matrix (SSIM)

Factors	Factor 5	Factor 4	Factor 3	Factor 2	Factor 1
Factor 1	V	V	V	O	X
Factor 2	V	V	V	X	O
Factor 3	V	V	X	A	A
Factor 4	X	X	A	A	A
Factor 5	X	X	A	A	A

Factor 1 = Age, Factor 2 = Gender, Factor 3 = Tax knowledge, Factor 4 = Perception of legislative tax complexity, Factor 5 = Perception of compliance tax complexity.

Table 3 Initial reachability matrix

Factors	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1	1	0	1	1	1
Factor 2	0	1	1	1	1
Factor 3	0	0	1	1	1
Factor 4	0	0	0	1	1
Factor 5	0	0	0	1	1

Factor 1 = Age, Factor 2 = Gender, Factor 3 = Tax knowledge, Factor 4 = Perception of legislative tax complexity, Factor 5 = Perception of compliance tax complexity.

Table 4 Final reachability matrix

Factors	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Factor 1	1	0	1	1	1
Factor 2	0	1	1	1	1
Factor 3	0	0	1	1	1
Factor 4	0	0	0	1	1
Factor 5	0	0	0	1	1

Factor 1 = Age, Factor 2 = Gender, Factor 3 = Tax knowledge, Factor 4 = Perception of legislative tax complexity, Factor 5 = Perception of compliance tax complexity.

Level Partitions

The reachability and antecedent set for each value is obtained from the final reachability matrix (Warfield, 1974). The reachability set for a particular variable consists of the variable itself and the other variables, which may help the achievement. The antecedent set consists of the variable itself and the other variables, which may help in achieving them. Subsequently, the intersection of these sets is derived for all variables. The variable for which the reachability and the intersection sets are the same is given the top-level variable in the ISM hierarchy, which would not help achieve any other variable above their own level. After the top-level elements have been identified, the other remaining variables are discarded. In this study, the 5 values,

along with their reachability set, antecedent set, intersection set and levels, are presented in Table 5. Level identification process of these values is completed in three iterations.

From Table 5, it can be seen that tax professionals' perception of legislative tax complexity (5) and tax professionals' perception of compliance tax complexity (4) are found at level III.

Thus, they are positioned at the top of the ISM model.

This iteration is continued until the levels of each variable are obtained. The identified levels aid in building the digraph and the final model of ISM (Mathiyazhagan et al., 2013).

Formation of ISM-Based Model

The relation between the factors j and i is shown by an arrow pointing from i to j . The resulting graph is called a digraph. Removing the transitivity as described in the ISM methodology, the digraph is finally converted into the ISM model.

The top level of the digraph identifies two variables «perception of legislative tax complexity» (4) and «perception of compliance tax complexity» (5). They are at the top of the model because they have the maximum dependence power and the minimal driving power. As a result, these variables depend heavily on the low-level variables.

The second level is occupied by the variable «tax knowledge» (3). The second level is where the variable, with strong links between itself and other levels are contained. This variable is in the 'Linkage' quadrant of the MICMAC diagram, with identical dependence power and similar driving power. This means that this variable is influenced, at the same time, by its down-level variables and by the top-level variables.

The final level contains two variables 'age' (1) and 'gender' (1). They are with a high driving power and low dependence power sited on the MICMC diagram. For

Table 5 Level partition

Factors	Reachability set	Antecedent set	Intersection set	Level
Factor 1	C2-C3-C4-C5	C2	C2	I
Factor 2	C1-C3-C4-C5	C1	C1	
Factor 3	C3-C4-C5	C1-C2-C3	C3	
Factor 4	C4-C5	C1-C2-C3-C4-C5	C4-C5	
Factor 5	C4-C5	C1-C2-C3-C4-C5	C4-C5	I
Factors	Reachability set	Antecedent set	Intersection set	Level
Factor 4	C2-C3	C2	C2	II
Factor 5	C1-C3	C1	C1	
Factor 3	C3	C1-C2-C3	C3	
Factors	Reachability set	Antecedent set	Intersection set	Level
Factor 1	C2	C2	C2	III
Factor 2	C1	C1	C1	III

this reason, they are featured in the bottom level as they lack the connections with other variables that makes them dependent. But they have enough driving power to influence the level above them (Fig. 3).

MICMAC Analysis

The main purpose of the MICMAC analysis is to understand the driving power and dependency of each variable within the ISM and identify key factors in the Tax professionals' tax noncompliant behavior hierarchy. The definition of driving power and dependence in the MICMAC matrix with the sum of the number of along each row and column of each variable is performed from Table 4. The sum of each row and column for each coordinate variable in which the variable is located on the graph (Fig. 4). The four MICMAC frameworks determine the impact of power effects and dependencies between different relationships between variables. In other words, how variable is variable, indicates the amount of the power it has and its dependence on other variables, and how it is in the ISM model. The four sections are:

- **Independent**—defines variables that are of a weak dependence power but of high driving power, in addition, they are quite often seen as key factors.
- **Dependent**—Define variables that have a strong dependency barrier, but poor driving power. They are usually variables that are heavily influenced by others.
- **Autonomous**—Defines variables with poor driving power and dependency. They have very little influence, and they have very little relation to other variables.
- **Link**—Defines placeholders with high driving power and high affiliation power. They are considered as unsustainable, and any actions taken using these variables are likely to create a corresponding response that affects itself and other variables.

Fig. 3 ISM- based model for Factors

Fig. 4 Driving Power and Dependence Power Diagram

Most variables in the MICMAC diagram are within the ‘independent’ and ‘dependent’ quadrants. This diagram shows that the variables in the ‘independent’ quadrant have high driving power and low dependence power, unlike the variables located in the ‘dependent’ quadrant, they have the driving power necessary to influence other variables and so are situated in the bottom layer model. This clustering indicates that there is one variable that directs a small number of dependent variables, therefore is positioned in the middle ground of the ISM model.

The variable in the ‘Linkage’ quadrant is unstable and any action that is taken in relation to that variable will have a corresponding reaction on the others. The main characteristic of this type of variable is that due to the nature and large number of connections, any failure in it, will have a knock-on effect and potential to cause failure among other variables.

The variables located in the ‘Dependent’ quadrant are those variables that are heavily affected by the actions taken regarding those situated in the ‘Linkage’ quadrant. They do not have the driving power necessary to influence other variables, so they are situated in the top layer model. There are no variables in the ‘Autonomous’ quadrant showing there are no variables that have zero interconnections with the others in the MICMAC diagram. As a result, it is fair to assume that all variables are connected in some way due to the levels of driving and dependence power that they possess. The MICMAC analysis has been adapted from Rana et al. (2019)].

The driver power and dependence power of each of these 5 dimensions in this case study are shown in Table 6.

More details of the final full ISM model for the 5 dimensions are given in Fig. 4.

As shown in the results of Table 6 and Fig. 4, the variables the ‘perception of legislative tax complexity’ (4) and ‘perception of compliance tax complexity’ (5) are considered dependent variables that means, they are influenced by other variables. This fluency is from the independent variables ‘age’ (1) and ‘gender’ (2), which are

Table 6 Dependence power and driving power

Factors	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Driving power
Factor 1	1	0	1	1	1	4
Factor 2	0	1	1	1	1	4
Factor 3	0	0	1	1	1	3
Factor 4	0	0	0	1	1	2
Factor 5	0	0	0	1	1	2
Dependence power	1	1	3	5	5	

Factor 1= Age, Factor 2= Gender, Factor 3= Tax knowledge, Factor 4= Perception of legislative tax complexity, Factor 5= Perception of compliance tax complexity

fundamental for the noncompliant behavior. ‘Tax knowledge’ (3) is the Linkage: any actions on that variable causes a change in the variable, as well as, in other variables.

Discussion

Most of the Factors Affecting Tax professionals’ tax noncompliant behavior have higher than average driving power and are positioned in the ‘Independent’ and ‘Linkage’ quadrants of the MICMAC diagram. As a result, they are characterized by their dependence on each other and their ability to influence other variables within the model. There are two variables with a driving power lower than average. They are both positioned in the ‘Dependent’ quadrant and score a high level of dependence power, suggesting they rely heavily on other factors on the first level of the ISM model. In this situation are the variables ‘perception of legislative tax complexity’ (4) and ‘perception of compliance tax complexity’ (5); they exhibit high dependence power; hence they are positioned at the higher position in the ISM model. However, it is their lower driving power that creates the sense of vulnerability because they rely on all other variables below them. For example, towards high levels of tax knowledge, tax professionals have a positive or negative approach to tax compliance, depending on the level of tax complexity (Erard, 1993; Hite & McGill, 1992; Stephenson, 2007). These factors are shown in the MICMAC analysis because these variables exhibit the maximum levels of dependency, this means that these factors are strongly impacted by other related factors in the ISM model. These results are corroborated by the literature, for instance, Bloomquist et al. (2007) and Laffer et al. (2011) refer clearly that tax complexity provides opportunities for Tax professionals’ tax noncompliant behavior.

The driving power and the dependence power of ‘Tax knowledge’ (3) is higher than average. Therefore, Level II hosts the variable within the ‘Linkage’ quadrant. Hence, in the ISM model, it is in the middle position. The middle position of tax knowledge indicates that while this variable is affected by low-level variables, it also affects the previous level variables. These results corroborate the literature: there

is a set of studies which conclude that tax knowledge is an effective factor in the perception of tax complexity and Tax professionals' tax (non)compliant behavior (Klepper & Nagin, 1989; Klepper et al., 1991; Hite and McGill 0.1992; Erard, 1993; O'Donnell et al., 2005).

The bottom level of the ISM model (Level III) is represented by two variables: 'Age' (1) and 'gender' (2)—in the MICMAC diagram they have the maximum driving power and the minimum dependence power, which position them in the 'independent' quadrant and at the bottom of the ISM model.

Considering that this study examines Tax professionals' tax noncompliant behavior by using the interpretive structural modelling (ISM), it is logical that age and gender factors are the basis for the explanation of Tax professionals' tax noncompliant behavior and the other factors are affected by them at higher levels.

It is important to emphasize that the relevance of age and gender finds an echo in the previous literature, but mainly in the perspective of the taxpayers. In that scope, Devos (2005) states that the demographic characteristics of Social and psychological tax models play an important role in taxpayers (non)compliant behaviors.

According to the previous literature, as well as with this study, there are differences of perceptions, attitudes, and behaviors among age groups, as well as between men and women. Regarding the differences among age groups, they can be explained, for example by the differences between socialization of younger generations and older generations. Moreover, social values, attitudes towards the government and taxes may change from one age group to another. For example, with aging the need for public goods, such health care and social security, increases; older citizens might, thus, treasure more the benefits of taxes than younger ones, and, consequently, older taxpayers have a greater propensity for tax compliance. Older persons, also, might be in a better financial situation than younger ones, thus, it is easier for them to afford being tax compliant due to fewer budget constraints (Kirchler, 2007). Borrego et al., (2015, 2017) added another justification for the differences in professionals' context: the younger professionals, for fear of losing their job / clients, may be more susceptible to pressure to adhere to/to promote aggressive tax planning schemes.

In terms of gender, studies on taxpayers' behavior conclude that women have higher tax compliance behaviors than men, because women over-estimate the probability of detection and punishment in an audit (Hasseldine, 1999), tax morale is higher in women (Torgler & Schneider, 2004), and the propensity for risk is lower in women (Kastlunger et al., 2010), however Borrego et al., (2015, 2017) found that female tax professionals (specifically the youngest) were the group most prone to voluntary tax noncompliance; considering that this was justified by the greater vulnerability of that group to pressure from clients / employers.

As seen in the ISM model, 'age' (1) and 'gender' (2) are directly related to 'Tax knowledge' (3) and 'perception of legislative tax complexity' (4) and 'perception of compliance tax complexity' (5). In addition, 'tax knowledge' (3) under the influence of 'age' (1) and 'gender' (2) has influence on 'perception of legislative tax complexity' (4) and 'perception of compliance tax complexity' (5). As a result, there is a multilateral relationship between the research factors.

Conclusion, Limitations, and Future Research

This study has explored the Factors Affecting Tax professionals' tax noncompliant behavior. Using ISM, the factors have been put into a model to analysis the hierarchy and interaction between them.

The MICMAC diagram has identified the driving and dependence power of each variable and assigned them to a specific quadrant on the diagram. The resulting positioning of the variables suggests a medium–high driving power is associated with most variables. High driving power is related to high levels of influence over related factors. The levels at the bottom of the ISM model are occupied by two factors with the highest level of driving power (this means that the variables at higher levels are affected by the final level variables): 'age' and 'gender' are at the final level of the ISM model.

The results of ISM modelling showed that 'age' and 'gender' are directly related to 'Tax knowledge', 'perception of legislative tax complexity' and 'perception of compliance tax complexity'; also, tax knowledge', under the influence of 'age' and 'gender', has influence on 'perception of legislative tax complexity' and 'perception of compliance tax complexity'. This shows the direct and indirect influence of the variables 'age' and 'gender' on all factors of tax noncompliance and emphasizes the importance of examining the relationship between 'age' and 'gender' with other factors affecting tax professionals' tax noncompliant behavior.

Considering the starting questions of this research, the present study has several contributions to theory. Firstly, by reviewing the literature, as well as by collecting the perception of tax authority experts, the five Factors affecting the Tax professionals' tax noncompliant behavior were identified and analysed: age, gender, tax knowledge, perception of legislative tax complexity, and perception of compliance tax complexity. Secondly, as far as we know, this is the first research on this topic that has explored the Factors Affecting Tax professionals' tax noncompliant behavior and derived its framework using ISM. Thirdly, the MICMAC diagram also provides the nature of variables that clearly identifies their driving and dependence powers. This helps researchers to understand the nature of variables more clearly, because they are more like independent, mediating, or dependent variables. Finally, the framework developed, by using ISM, could help researchers picking up the selected variables for experimental evaluation of the proposed research model.

It is, also, important to mention that this study had limitations. Although the process followed the steps as outlined in the ISM, the model is highly dependent on the judgments of the expert team and the results have not been statistically validated. To validate the results, primary data must be collected for the Factors Affecting Tax professionals' tax noncompliant behavior in the proposed framework.

Additionally, the lack of studies on the Factors Affecting Tax professionals' tax noncompliant behavior led to the identification of few numbers of factors in the current study. Therefore, it is suggested the researchers, through an exploratory study, select more variables for their work, to expand the scope of their research.

As an additional topic for future investigations, it is important to notice that, in the future, the researchers intend to validate this model using the structural equation modelling (SEM) framework.

References

- Allingham, M., & Sandmo, A. (1972). Income tax evasion: A theoretical analysis. *Journal of Public Economics*, 1(34), 323–338.
- Alm, J., McClelland, G. H., & Schulze, W. D. (1992). Why do people pay taxes? *Journal of Public Economics*, 48, 21–38.
- Alm, J., Jackson, B., & McKee, M. (1992b). Estimating the determinants of taxpayer compliance with experimental data. *National Tax Journal*, 45(1), 107–114.
- Alm, J., Cherry, T., Jones, M., & McKee, M. (2010). Taxpayer information assistance services and tax compliance behavior. *Journal of Economic Psychology*, 31(4), 577–586.
- American Institute of Certified Public Accountants. (1992). *Blueprint for tax simplification*. AICPA.
- Andrei, A.L., Comer, K. and Koehler, M. (2014) An Agent-based model of networks effects on Tax Compliance. *Journal of Economic Psychology*, 40(Special Issue), pp. 119–133.
- Andreoni, J., Erard, B., & Feinstein, J. (1998). Tax Compliance. *Journal of Economic Literature*, 36(2), 818–860.
- Ayres, F., Jackson, B., & Hite, P. (1989). The Economic Benefits of Regulation: Evidence from Professional Tax Professionals. *Accounting Review*, 64(2), 300–312.
- Becker, G. S. (1968). Crime and Punishment: An Economic Approach. *Journal of Political Economy*, 76(2), 223–250.
- Bernasconi, M. (1998). Tax evasion and orders of risk aversion. *Journal of Public Economics*, 67(1), 123–134.
- Bloomquist K., Albert M. and Edgerton R. (2007) Evaluating preparation accuracy of tax practitioners: A bootstrap approach. *IRS Research Bulletin*. 78–90.
- Borrego A.C., Loo E.C., Lopes C.M., Ferreira C.M.S. (2015) Tax professionals' perception of tax system complexity: some preliminary empirical evidence from Portugal. *EJTR*.13 (1):338–360.
- Borrego A.C., Lopes C.M., Ferreira C.M.S. (2017) Tax professionals' profiles concerning tax noncompliance and tax complexity: Empirical contributions from Portugal. *EJTR*.15 (3): 424–456.
- Borrego, A. C. (2015). *Tax compliance and tax complexity in Portugal: essays on the perception of tax professionals*. PhD Thesis. Minho University, Portugal.
- Brown, R. E., & Mazur, M. J. (2002). National Research Program: Measuring Taxpayer Compliance Comprehensively. *Th U Kan l Rev*, 51, 1255.
- Carnes, G. A., & Cuccia, A. D. (1996). An analysis of the effect of tax complexity and its perceived justification on equity judgments. *Journal of the American Taxation Association*, 18, 40–56.
- Chung, J., & Trivedi, V. U. (2003). The effect of friendly persuasion and gender on tax compliance behavior. *Journal of Business Ethics*, 47, 133–145.
- Cobham, A., & Janský, P. (2018). Global distribution of revenue loss from corporate tax avoidance: re estimation and country results. *Journal of International Development*, 30(2), 206–232
- Collier R., Kari S., Ropponen O., Simmler M, Todtenhaupt M. (2018) *Dissecting the EU's Recent Anti-Tax Avoidance Measures: Merits and Problems*. EconPol Policy Report, European Network for Economic and Fiscal Policy Research.
- Cowell, F. A. (1981). Taxation and Labor Supply with Risky Activities. *Economia New Series*, 48(192), 365–379.
- Cox, S. P., & Eger, R. J. (2006). Procedural complexity of tax administration: The road fund case. *Journal of Public Budgeting, Accounting & Financial Management*, 18(3), 259.
- Crivelli E., Mooij R., Keen M. (2016) Base erosion, profit shifting and developing countries. *FinanzArchiv: Public Finance Analysis*. 72(3): 268–301. Retrieved from: <https://doi.org/10.1628/001522116X14646834385460>.
- Cullis, J., & Lewis, A. (1997). Why people pay taxes: From a conventional economic model to a model of social convention. *Journal of Economic Psychology*, 18(2/3), 305–321.
- Devos, K. (2012). The impact of tax professionals upon the compliance behavior of Australian individual taxpayers. *Revenue Tax Journal*, 22(1), 1–26.

- Devos K. (2005) The attitudes of Tertiary Students on Tax Evasion and the Penalties for Tax Evasion – A Pilot Study and Demographic Analysis. *e-Journal of Tax Research*, 3(2):222–273.
- Erard, B. (1993). Taxation with representation: An analysis of the role of tax practitioners in tax compliance. *Journal of Public Economics*, 52, 163–197.
- Eric, A., Solomon, A., Kwaku, A., Agyeiwa, H., & Antwi, K. (2019). An Empirical Assessment of Tax Knowledge, Socio-Economic Characteristics and Their Effects on Tax Compliance Behavior in Sunyani Municipality, Ghana. *Journal of Emerging Trends in Economics and Management Sciences (JETEMS)*, 10(4), 148–153.
- Erich, K., Niemiowski, A., & Wearing, A. (2006). Shared subjective views, intent to Cooperate and tax compliance: Similarities between Australian taxpayers and tax officers. *Journal of Economic Psychology*, 27(4), 502–517.
- Eswaralal, V. K., Dey, P. K., & Shankar, R. (2011). *Enhanced renewable energy adoption for sustainable development in India: interpretive structural modeling approach*
- Feinstein, J. M. (1991). An econometric analysis of income tax evasion and its detection. *RAND Journal of Economics*, 22(1), 14–35.
- Feld, L. P., & Frey, B. S. (2007). Tax compliance as the result of a psychological tax contract. The role of incentives and responsive regulation. *Law & Policy*, 29(1), 102–120.
- Fischer, C. M., Wartick, M., & Mark, M. (1992). Detection probability and taxpayer compliance: A review of the literature. *Journal of Accounting Literature*, 11, 1–46.
- Galbiati, R., & Zanella, G. (2012). Tax Evasion Social multiplier: Evidence from Italy. *Journal of Public Economics*, 96(5–6), 485–496.
- Gammie, M. (1996). The global future of income tax. *Bulletin for International Fiscal Documentation*, 50(10), 477–480.
- Gilligan, G., & Richardson, G. (2005). Perceptions of tax fairness and tax compliance in Australia and Hong Kong: A preliminary study”. *Journal of Financial Crime*, 12(4), 331–343.
- Graetz, M. J., & Wilde, L. (1985). The Economics of Tax Compliance: Fact and Fantasy. *National Tax Journal*, 38(3), 355–363.
- Hasseldine, J. (1999). Gender Differences in Tax Compliance. *Asia-Pacific Journal of Taxation*, 3, 73–89.
- Hite, P., & McGill, G. (1992). An Examination on of Taxpayers preference for Aggressive Tax Advice. *National Tax Journal*, 45(4), 389–403.
- Ho, D., & Wong, B. (2008). Issues on compliance and ethics in taxation: What do we know?”. *Journal of Financial Crime*, 15(4), 369–382.
- Hoppe T., Schanz D., Sturm S., Sureth-Sloane C. (2019) Measuring tax complexity across countries: A survey study on MNCs.
- Jackson, B., & Milliron, V. (1986). Tax compliance research: Findings, problems, and prospects. *Journal of Accounting Literature*, 5, 125–165.
- Kannan, G., Pokharel, S., & Kumar, P. S. (2009). A hybrid approach using ISM and fuzzy TOPSIS for the selection of reverse logistics provider. *Resources, Conservation and Recycling*, 54(1), 28–36.
- Kastlunger, B., Dressler, S. G., Kirchler, E., Mittone, L., & Voracek, M. (2010). Sex differences in Tax Compliance: Differentiating between demographic sex, gender-role orientation, and prenatal masculinization (2D:4D). *Journal of Economic Psychology*, 31, 542–552.
- Kirchler, E. (2007). *The economic psychology of tax behavior*. Cambridge University Press
- Kirchler, E., Hoelzl, E., & Wahl, I. (2008). Enforced versus voluntary tax compliance: The slippery slope framework. *Journal of Economic Psychology*, 29, 210–225.
- Klepper, S., & Nagin, D. (1989). The role of Tax professionals in Tax Compliance. *Policy Sciences*, 22, 167–194.
- Klepper, S., Mazur, M., & Nagin, D. (1991). Expert intermediaries and legal compliance: The case of tax professionals. *Journal of Law and Economics*, 34(1), 205–229.
- Laffer A.B., Winegarden W.H., Childs J. (2011) *The Economic Burden Caused by Tax Code Complexity*. Austin. The Laffer Center.
- Long, S. B., & Swingen, J. A. (1987). An approach to the measurement of tax law complexity. *Journal of the American Taxation Association*, 8(2), 22–36.
- Loo, E. C., McKerchar, M., & Hansford, A. (2009). Understanding the compliance behavior of Malaysia Individual taxpayer using a mixed method approach. *Journal of the Australian Tax Teacher Association*, 4(1), 181–202.
- Lopes, C. M. (2008). *Quanto Custa Pagar Impostos em Portugal?* Coimbra. Almedina

- Lopes, C. M. (2012). Os benefícios e os custos do cumprimento fiscal: Breve revisão de Literatura. *Argumentum*, 13, 17–38.
- Mathiyazhag, K., Govindan, K., NoorulHag, A., & Geng, Y. (2013). An ISM approach for the barrier analysis in implementing green supply chain management. *Journal of Cleaner Production*, 47, 283–297.
- McKerchar, M. (2005). The Impact of Tax Complexity on Practitioners in Australia. *Australian Tax Forum*, 20(4), 529–554.
- McKerchar, M. (2007). Tax Complexity and its Impact on Tax Compliance and Tax Administration in Australia. *IRS Research Bulletin*, 1500, 185–204.
- McKerchar, M., Ingraham, L., & Karlinsky, S. (2005). Tax Complexity and Small business: A Comparison of the perceptions of the tax agents in the United States and Australia. *Journal of Australian Taxation*, 8(2), 289–327.
- Nagin, D. S. (1990). Policy options for combating tax non-compliance. *Journal of Policy Analysis and Management*, 9(1), 7–22.
- Newberry, K., Reckers, P., & Wyndelts, R. (1993). An examination of tax practitioner decisions: The role of preparer sanctions and framing effects associated with customer condition. *Journal of Economic Psychology*, 14(2), 439–452.
- Nurlis, M. (2015) The Effect of Taxpayer Awareness, Knowledge, Tax Penalties and Tax Authorities Services on the Tax Compliance: Survey on the Individual Taxpayer. Jabodetabek & Bandung.
- O'Donnell, E., Koch, B., & Boone, J. (2005). The influence of domain knowledge and task complexity on tax professional's compliance recommendations. *Accounting, Organizations and Society*, 30(2), 145–165.
- Organisation for Economic Cooperation and Development (OECD). (2008). *Governance, taxation and accountability: Issues and practices*. Development Assistance Committee Guidelines and Reference Series
- Pau, C., Sawyer, A., & Maples, A. (2007). Complexity of New Zealand's tax laws: An empirical study. *Australian Tax Forum*, 22(1), 59–92.
- Pencavel, J. H. (1979). A Note on Income Tax Evasion, Labor Supply, a Nonlinear Tax Schedules. *Journal of Public Economics*, 12(1), 115–124.
- Pommerehne, W. W., & Weck-Hannemann, H. (1996). Tax rates, tax administration and income tax evasion in Switzerland. *Public Choice*, 88(1/2), 161–170.
- Raj, T., Shankar, R., & Suhaib, M. (2008). An ISM approach for modelling the enablers of flexible manufacturing system: The case for India. *International Journal of Production Research*, 46(24), 6883–6912.
- Rana, N. P., Barnard, D. J., Baabdullah, A. M., Rees, D., & Roderick, S. (2019). Exploring barriers of m-commerce adoption in SMEs in the UK: Developing a framework using ISM. *International Journal of Information Management*, 44, 141–153.
- Reckers, P., Sanders, D., & Wyndelts, R. (1991). An empirical investigation of factors influencing tax practitioner compliance. *Journal of the American Taxation Association*, 13(2), 30–46.
- Saad, N. (2014). Tax knowledge, tax complexity and tax compliance: Taxpayers' View. *Procedia - Social and Behavioral Sciences*, 109(1), 1069–1075.
- Sandmo, A. (2005). The theory of tax evasion: A retrospective view. *National Tax Journal*, 58(4), 643–663.
- Saw, K., & Sawyer, A. (2010). Complexity of New Zealand's income tax legislation. *Australian Tax Forum*, 25, 213–244.
- Schuetze, H. (2002). Profiles of tax non-compliance among the self-employed in Canada: 1969–1992. *Canadian Public Policy*, 28(2), 219–238.
- Scotchmer, S. (1987). Audit classes and Tax enforcement Policy. *American Economic Review*, 77(2), 229–233.
- Siqueira, M.L. and Ramos, F.S. (2005). A Economia da Sonegação. Teorias e Evidências Empíricas. *Revista de Economia Contemporânea*, 9(3):555–581.
- Slemrod, J. (2007). Cheating Ourselves: The Economics of Tax Evasion. *Journal of Economic Perspectives*, 21(1), 25–48.
- Slemrod, J., & Bakija, J. M. (2008). *Taxing Ourselves: A Citizen's Guide to the Debate over Taxes*. MIT Press.
- Spicer, M. W., & Becker, L. A. (1980). Fiscal Inequity and Tax Evasion: An Experimental Approach. *National Tax Journal*, 33(2), 171–175.

- Spicer, M. W., & Hero, R. E. (1985). Tax evasion and heuristics: A research note. *Journal of Public Economics*, 26, 263–267.
- Stephenson, T. (2007). Do customers share professionals' Self-Assessment of the extent to which advocate for their customers? *Accounting Horizons*, 21(4), 411–422.
- Tagkalakis, A. (2013). Audits and Tax Offenders: Recent Evidences from Greece. *Economics Letters*, 118(3), 519–522.
- Torgler, B. (2004). Tax morale in Asian countries. *Journal of Asian Economics*, 15(2), 237–266.
- Torgler, B. (2006a). The importance of faith: Tax morale and religiosity. *Journal of Economic Behavior & Organization*, 61(1), 81–109.
- Torgler, B. (2006b). The importance of faith: Tax morale and religiosity. *Journal of Economic Behavior & Organization*, 61(1), 81–109.
- Torgler, B., & Valev, N. (2010). Gender and Public Attitudes toward Corruption and Tax Evasion. *Contemporary Economic Policy*, 28(4), 554–568.
- Torgler, B., & Schneider, F. (2004). *Does culture influence tax morale? Evidence from different European countries*. CREMA Working Paper, No. 2004-17, Center for Research in Economics, Management and the Arts (CREMA)
- Vogel, J. (1974). Taxation and Public Opinion Sweden: An Interpretation of recent Survey data. *National Tax Journal*, 27(4), 499.
- Warfield, J. N. (1974). Developing interconnection matrices in structural modelling. *IEEE Transactions on Systems, Man, and Cybernetics*, 1, 81–87.

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