

**THE ASSOCIATION BETWEEN SELF-ASSESSED TAX KNOWLEDGE AND TAX
COMPLIANCE**

by

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ABSTRACT

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Background: Although many different tax collection systems are used in countries around the world, the one most commonly used one is the self-assessment system of taxation. Where this system is applied, taxpayers themselves are responsible for computing their tax returns. Taxpayers are therefore required to have sufficient tax knowledge to ensure that they can comply with their tax obligations. This study examines the association between self-assessed tax knowledge and tax compliance.

Main purpose of the study: To assess whether there is an association between self-assessed tax knowledge and tax compliance, and whether the association is affected by factors such as gender, population group and educational level.

Method: A quantitative research method was used to analyse secondary data. Inferential statistical methods such as linear regression analysis and moderation analysis were employed in order to address the research objectives.

Results: The results of the linear regression analyses showed that there is a statistically significant association between self-assessed tax knowledge and tax compliance. Gender and population group were not found to be moderators in the association between self-assessed tax knowledge and tax-compliance behaviour. Level of education, particularly higher education, was a statistically significant moderator, while a lower level of education was not a statistically significant moderator.

Conclusions:

The findings of this study expand the knowledge of the association between tax knowledge and tax compliance. Furthermore, since this study focused on self-assessed tax knowledge, it provides insight on whether the positive association between tax knowledge and tax compliance still holds in instances of self-assessed tax knowledge. This study also confirms that taxpayers' educational level is a moderating factor in the association between (self-assessed) tax knowledge and tax compliance.

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LIST OF ABBREVIATIONS AND ACRONYMS

Table 1: Abbreviations and acronyms used in this document

Abbreviation	Meaning
SMEs	Small and medium enterprises
SARS	South African Revenue Service
COVID-19	Coronavirus disease of 2019
SPSS	Statistical package for the social sciences

CHAPTER 1: INTRODUCTION

1.1. INTRODUCTION

Taxes make up a significant portion of the funds collected by governments to enable them to fulfil their obligations to their citizens and are therefore essential to a well-functioning state (Vainre, Aaben, Paulus, Koppel, Tammsaar, Telve, Koppel, Beilmann & Uusberg, 2020:1). The effective collection and management of national earnings, including taxes, is of great importance in both developing and developed countries (Agyeiwaa, Amankwaah, Abina, Agyei & Antwi, 2019:148).

The collection of tax revenue can be influenced by various factors, such as the level of tax compliance. James and Alley (2002:29) define tax compliance as the degree to which taxpayers comply with the applicable tax laws. Palil and Mustapha (2011:12865) further state that tax compliance refers to the taxpayers' willingness and ability to comply with tax laws, and Siwi, Rawung and Salindeho (2020:46) define it as taxpayers' behaviour in carrying out their tax obligations by paying their taxes as determined by tax legislation.

Taxpayers' tax compliance can be affected by a wide range of factors, such as the tax knowledge required to comply with applicable tax laws (Chau, 2009). Tax knowledge is defined as everything that taxpayers know and understand about taxes (Siwi *et al.*, 2020:47).

Given the contribution of taxpayers' level of education to their general understanding of tax laws, tax education can perhaps be made available to taxpayers to enable them to read and correctly apply tax laws. Understanding and complying with tax laws and computing the correct tax obligation(s) might positively affect their tax compliance behaviour. In a self-assessment system, taxpayers are responsible for ensuring that they comply with the current tax laws.

Revenue authorities primarily require taxpayers to file accurate tax returns by predetermined dates and to pay the required tax voluntarily and in a timely manner, as prescribed by tax laws (Sebele-Mpofu & Chinoda, 2019:407). However, the question is how taxpayers will be

able to deliver these three key elements if they cannot correctly interpret the tax legislation (Sebele-Mpofu & Chinoda, 2019:407).

According to Alkhatib, Hamad and Hermas (2020:349), tax knowledge is a vital factor when attempting to determine the tax compliance of taxpayers in a self-assessment system. "Tax knowledge is a corner stone as far as voluntary compliance is concerned" (Shiferaw & Tesfaye, 2020:994).

Since a self-assessment system requires taxpayers to compute their own tax liability and pay over the taxes to the revenue authorities, they are assumed to have a certain level of tax knowledge. Taxpayers can therefore self-assess their own tax knowledge as they are aware of how well they are informed with regard to tax-related matters. Self-assessment is defined as "an evaluation of one's actions, attitudes or performance" (Oxford Dictionary. Not dated). Self-assessed knowledge is very subjective as the evaluation is done by oneself and can only be objective when individuals have tangible evidence to corroborate their judgement.

Bornman and Ramutumbu (2019:836) suggest that tax knowledge can be described by using a framework that divides tax knowledge into three categories, namely general tax knowledge, procedural tax knowledge and legal tax knowledge. The first, general tax knowledge, refers to taxpayers having an understanding of their financial contribution to the economy and knowing why they pay taxes by understanding the rationale behind taxation and the aims of the government's fiscal policies (Bornman & Ramatumbu, 2019:828).

The second, procedural tax knowledge, refers to the administration of taxes, namely record-keeping, filing tax returns and correspondence between the tax authorities and the taxpayer (Bornman & Ramatumbu, 2019:831), whereas the third, legal tax knowledge, refers to an understanding of the terminology used in tax legislation and the ability to use it correctly in interpreting one's own specific situation (Bornman & Ramatumbu, 2019:830). In this research study, the focus is on legal tax knowledge.

According to Agyeiwaa *et al.* (2019:149), the association between tax compliance and tax knowledge has not been given enough attention in recent studies. This study contributes to this area of tax compliance research, particularly in South Africa. As noted by Shiferaw and

Tesfaye (2020:983), if tax compliance can be improved, the revenue needed to fund public services will be available without the government having to resort to other measures such as increasing the tax burden on already burdened compliant taxpayers.

Secondary data collected from students who participated in a tax research experiment conducted to determine their self-assessed tax knowledge was used to address the objectives of the current study. It is important to gain a deeper understanding of the factors that are relevant to the tax compliance decisions of young people as they are the next generation of taxpayers (Nora, 2021:101).

1.2. BACKGROUND

The tax collection systems used in different countries to collect taxes from individuals include the official assessment system, the withholding assessment system and the self-assessment system (Kurniawan, 2020:58). The current tax collection system that is applicable to individual taxpayers in South Africa is divided into the following categories: the withholding assessment system, the self-assessment system and the auto-assessment system that was recently developed by the South African Revenue Service (SARS) (SARS, 2021).

The withholding assessment system, is a tax system that grants authority to third parties (neither the tax authority nor the affected taxpayer) to compute the amount of tax to be withheld from the taxpayer and paid to the relevant fiscal authority (Kurniawan, 2020:58). The self-assessment system, provides taxpayers with the privilege to calculate, pay and report on their own tax obligations (Halim, Bawono & Dara, 2016). The auto-assessment system according to which SARS uses data received from employers, financial institutions, retirement annuity fund administrators, medical aid schemes and other relevant third-party providers of data to compute individuals' tax liability (SARS, 2021).

Currently the self-assessment system is the prevailing system used worldwide (Kurniawan, 2020:58). The problem posed by the self-assessment system is that it shifts the responsibility for determining tax liability from the tax authorities to the taxpayers (Natrah, 2014:1069). This creates a problem with regard to the reliability of the calculated taxes as it

requires taxpayers to be knowledgeable about existing tax laws and provisions (Natrah, 2014:1069).

In a self-assessment system, tax knowledge is of vital importance to ensure the correct calculation of the amount of taxes due, based on the taxpayer's total earnings. In the past, SARS presented taxpayer education workshops at SARS branches countrywide in an attempt to improve taxpayers' tax knowledge. The workshops were provided to taxpayers regularly and covered a variety of topics. The purpose of those workshops was to ensure

- that taxpayers understand the basics of the numerous types of taxes that are currently applicable in the country;
- that they understand how the different types of taxes work; and
- that they are correctly following the tax laws applicable to those types of taxes (SARS, 2021).

Revenue authorities are encouraged to conform to best practices, such as providing taxpayers with detailed information regarding the tax system and how to comply with tax laws by completing their returns correctly, and informing them on payment methods and the sanctions that are applicable in cases of non-compliance (Mukasa, 2011:11).

Without tax education, taxpayers may resort to non-compliant measures. Since taxes are the most important source of income for the state, tax non-compliance has a negative effect on the state's revenue (Shandu, Maluleke & Lekgau 2019:170). Notwithstanding that, taxpayers are constantly looking for ways to reduce their tax liability or to avoid paying their taxes (Shandu *et al.*, 2019:170). Tax non-compliance comprises of tax evasion and tax fraud.

Tax evasion consists of actions taken by individuals in order to reduce their legally determined tax obligations this can be done by illegal and intentional scheming (Nkundabanyanga, Mvura, Nyamuyonjo, Opiso & Nakabuye, 2017:935). Tax evasion is a serious problem experienced in countries worldwide and has a negative effect on state budgets and public finances (Shandu *et al.*, 2019:170).

Tax evasion is the result of the economic behaviour of taxpayers, which is considered to be the leakage in tax liability (Shandu *et al.*, 2019:170). A leakage in the tax liability could be whereby the Receiver of Revenue receives less taxes from taxpayers. Tax evasion not only limits the ability of countries to implement their drafted economic policies (Shandu *et al.*, 2019:170), but also creates problems from the criminal justice point of view and countries routinely attempt to combat tax evasion and reduce the leakage (Shandu *et al.*, 2019:170). A major problem faced by many countries is that the tax evasion evolution is going faster than the actual regulation of legislation (Saxunova, Sulíkova & Szarkova, 2017: 633).

1.3. RATIONALE FOR THE STUDY

Tax knowledge is required for a person to fully comply with the self-assessment system of taxation as the tax authorities rely on taxpayers to keep up to date with existing tax laws and report their tax obligations as prescribed. Numerous studies have been undertaken to examine the association between tax knowledge and tax compliance. Those studies are summarised below:

To study the determinants of tax compliance through the self-assessment system in Tanzania, Barongo (2020) focused on the tax compliance of participants from small and medium enterprises (SMEs). The findings showed that tax compliance is influenced by, among other factors, a lack of knowledge of tax issues regarding SMEs. Barongo (2020) measured tax compliance by making use of a questionnaire that consisted of open-ended questions formulated to determine the participants' levels of tax compliance. The five-point scale (Strongly agree = 5, Agree = 4, Neutral = 3, Disagree = 2 and Strongly disagree = 1) was used.

Alkhatib *et al.* (2020) found that tax knowledge and tax ethics strongly influence tax compliance. However, since this finding was based on a systematic review of literature, which produced mixed points of view and therefore, further research needs to be undertaken to confirm the association between those two factors and tax compliance.

A study aimed at examining the effect of tax knowledge on the tax compliance of SMEs in Zimbabwe was conducted by Newman, Mwandambira, Charity and Ongayi (2018). It was established that the failure of SMEs to comply with tax law was due to the fact that they have

only the basic tax knowledge and lack a deeper understanding of the tax knowledge relevant to their situation. This study involved an analysis of empirical and theoretical literature on the association between tax compliance and tax knowledge.

Timothy and Abbas (2021) also examined the association between tax knowledge and tax compliance and found that there is a significant association between tax compliance and tax knowledge, and that the higher the tax knowledge, the higher the compliance level. To measure tax knowledge, a questionnaire was used that required the participants to answer “True” or “False” to questions relating to tax knowledge, while tax compliance was measured by using a questionnaire requiring participants to answer questions relating to tax compliant behaviour. A five-point Likert scale (1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; and 5 = Strongly agree) was used.

The majority of studies undertaken to examine the association between tax knowledge and tax compliance did not examine the association between self-assessed tax knowledge and tax compliance. Self-assessed tax knowledge is highly subjective as the individuals themselves do the assessment and knowledge is not measured by using a series of questions or statements. The current study fills this gap by examining the association between self-assessed tax knowledge and tax compliance.

Educational level could be a moderating factor in the association between tax knowledge and tax compliance as knowledge is expanded by pursuing further studies or being exposed to certain knowledge-enriching workshops or tax-related training. A study undertaken in Indonesia by Tambunan and Indriani (2021) found that people with low levels of education had a poor understanding of tax laws, which resulted in low levels of tax compliance.

The current study explores this research objective from a South African perspective. Tambunan and Indriani (2021) measured tax knowledge by qualitatively analysing questionnaires completed by, and interviews conducted with participants in their research.

Researchers have also found that there is a difference in compliance between different genders and population groups. Dare (2020), who studied tax compliance behaviour in South Africa, found that female taxpayers were more compliant than males, and that membership of a particular population group was insignificant in explaining individual tax compliant behaviour.

The current study aims to add to the body of knowledge relating to the effects of taxpayers' gender, membership of particular population groups and educational level on their tax compliance by determining whether the association between self-assessed tax knowledge and tax compliance differs based on gender, population group and educational level.

Borman and Ramatumbu, (2019) suggest that tax knowledge could be divided into general, procedural and legal tax knowledge. With this research study, an attempt was made to determine whether an association exists between self-assessed legal tax knowledge and tax compliance.

1.4. RESEARCH OBJECTIVES

The following research objectives will be addressed in the form of hypotheses:

- To determine the association between self-assessed tax knowledge and tax compliance.
- To determine whether the association between self-assessed tax knowledge and tax compliance differs based on population group.
- To determine whether the association between self-assessed tax knowledge and tax compliance differs based on gender.
- To determine whether the association between self-assessed tax knowledge and tax compliance differs based on level of education.

1.5. RESEARCH DESIGN AND METHODOLOGY

In this study, a quantitative research methodology was adopted to establish the association between self-assessed tax knowledge and tax compliance, and to determine whether this association differs based on population group, gender and level of education. A quantitative research approach is applied mainly when data is used to test a theory by examining the associations between variables measured numerically and it is then analysed using a range of statistical techniques (Saunders, Lewis & Thornhill, 2012:162).

The data analysed in this study is secondary data collected by Monageng (2020) for a study that examined the effect of reciprocity nudges on tax compliance. The data, collected from

a control group and four treatment groups, included self-assessed tax knowledge data, which is the data used in this study.

Relevant literature was collected and reviewed in order to formulate hypotheses, which were tested using the statistical software tool Statistical Package for the Social Sciences (SPSS). For this study, inferential statistics and descriptive statistics were calculated and discussed in order to obtain a better understanding of the data that was collected.

1.6. STRUCTURE OF THE MINI-DISSERTATION

This mini-dissertation is structured as follows:

CHAPTER 1: INTRODUCTION

This chapter provides an introduction and the background to the research topic. The rationale for the study, the research objectives, the research design and the methodology applied are discussed. An outline of the structure of the mini-dissertation is also included.

CHAPTER 2: LITERATURE REVIEW

This chapter contains a discussion of the review of existing literature that is relevant to the main theories dealt with in this study, namely tax compliance, tax non-compliance and tax knowledge. The hypotheses formulated based on the literature reviewed in this section are tested in Chapter 4: Data analysis and presentation of results.

CHAPTER 3: RESEARCH METHODOLOGY AND DESIGN

Chapter 3 includes a theoretical introduction to the available research methodologies and methods and a discussion of the methodology selected for the current study. The way in which the secondary data used was collected is also explained. The reliability and validity of the secondary data, and its applicability to this study are discussed, as well as research ethics applicable to the data analysis.

CHAPTER 4: DATA ANALYSIS AND PRESENTATION OF RESULTS

Chapter 4 contains an introduction to the data analysis. The results of the statistical analysis of the secondary data are presented and analysed in conjunction with the literature

collected, and the research objectives, in the form of different hypotheses, are tested by using SPSS. The data is presented using both inferential and descriptive statistics.

CHAPTER 5: CONCLUSION

This chapter concludes the study and contains a discussion of the practical implications of the findings on the community. The limitations of the study and its contribution to existing research is explained. Recommendations regarding possible future research are made, followed by concluding notes on the research objectives and hypotheses.

CHAPTER 2: LITERATURE REVIEW

2.1. INTRODUCTION

The aim of this research study was to establish whether there is an association between self-assessed tax knowledge and tax compliance. A brief overview of the self-assessment system will be followed by a discussion of the review of the literature relevant to this study. The available existing literature that was reviewed will be analysed and used to formulate the hypotheses tested in this study. The literature reviewed included literature on tax compliance, tax non-compliance and tax knowledge.

2.2. SELF-ASSESSMENT SYSTEM

Compliance with taxation laws occurs when taxpayers fulfil and execute all tax obligations (Nurmantu, 2012:148). The self-assessment system, which is used in many countries worldwide and also in South Africa, is the modern method used for the administration of tax collection (Pham *et al.*, 2020). It is to be expected that taxpayers' tax knowledge will play an important role in the success of the self-assessment system.

The self-assessment system requires taxpayers to calculate their taxable income, determine the tax amount due to the Receiver of Revenue, pay their taxes and file their tax returns (Barongo, 2020:11). Taxpayers using this system should be honest and should voluntarily declare their all their income and pay the prescribed taxes (Barongo, 2020:11). This self-assessment system therefore requires voluntary tax compliance from taxpayers (Pham *et al.*, 2020).

Taxpayers consist of individuals who pay taxes on the income they earn, businesses whose profits are taxed, and trusts taxed on the income that vests in them. Individuals who are employed are usually taxed by way of PAYE, which is deducted from their salaries by their employers and paid over to SARS on their behalf. Businesses, however, have to declare their earnings to SARS. The income of some individuals, such as small business owners, are not subject to third party withholding and they are required to report their income directly to SARS.

d'Amboise and Muldowney (1988:229) define a small business owner as someone who establishes and manages a business for the main purpose of making it his/her primary source of income, and for the furtherance of personal goals. Timothy and Abbas (2021:171) state that small businesses are usually identified by the level of revenue they make, the net value of their assets and the number of employees they employ. They further state that tax obligations relating to small businesses need to be self-assessed and self-reported by the business owners themselves.

Using the self-assessment system has advantages and disadvantages that could potentially apply to taxpayers, as can be seen in Table 2 below.

Table 2: Advantages and disadvantages of the self-assessment system

Reference	Advantages	Disadvantages
Barongo (2020:12)	Administrative costs are lower as tax authorities can select only a few taxpayers for audits.	Taxpayers might incur high compliance costs by hiring a tax professional to compute their taxes.
	It encourages good citizenship and tax compliance.	Dishonest taxpayers might not declare all their income and pay less tax, which will result in a loss of revenue to the state.
	There is a decrease in possible tax disputes.	
	Possible corruption is decreased as contact with the taxpayer is limited.	

Source: Barongo (2020:12)

Now that the self-assessment system has been discussed, literature concerned with tax compliance, tax non-compliance and tax knowledge will be discussed in the section that follows.

2.3. TAX COMPLIANCE

According to Tilahun (2019:1), tax compliance occurs when a taxpayer complies with tax requirements, which include reporting the correct tax liability as prescribed by court cases and the legislation applicable at the time and filling in a tax return. Mohamad and Ali (2017:1) define tax compliance as the willingness of a taxpayer to act in both the spirit of, and according to the letter of law to comply with tax administration requirements.

Voluntary tax compliance occurs when a taxpayer complies with the tax laws without being forced to do so and is notably important in a self-assessment system as tax payments are filed in tax returns based on the tax liability computed by the taxpayer (Sebele-Mpofu & Chinoda, 2019:407). According to Alkhatib *et al.* (2020:349), one of the measures that can be implemented to increase voluntary tax compliance is to ensure that taxpayers have a certain level of qualification and an adequate level of confidence in their ability to correctly calculate their taxes.

In an attempt to explain tax compliant behaviour a number of theories, including economically based theories and behavioural theories, were explored. For the purpose of this study, only three of those theories will be briefly discussed. They are the economic deterrence theory, the fiscal exchange theory and the theory of planned behaviour (Barongo, 2020:14).

2.3.1 Economic deterrence theory

According to Allingham and Sandmo (1972:324), a taxpayer's failure to declare his/her full income does not mean that the tax authorities will penalise that taxpayer as the likelihood of being audited is low. Therefore, the taxpayer can choose between declaring their full income or declaring only a part thereof (Allingham & Sandmo, 1972:324). By choosing the second alternative, they may obtain an economic advantage, provided that they are not selected for audit (Allingham & Sandmo, 1972:324).

Otindo (2019:7) states that the economic deterrence theory assumes that taxpayers are influenced by the cost benefit analysis that comes with the profit-seeking scheme they might

have, which will influence their actions. Mohamad and Ali (2017:3) express the view that this theory implies that taxpayers are risk averse, perfectly moral and risk-neutral individuals who choose to evade tax in order to maximise their utility, which is to retain most of their earnings and not pay over the tax due on those earnings to the revenue authorities.

This is only an economic analysis and suggests that tax evasion risk exists as many taxpayers might either claim excessive deductions that have not been independently verified (Nkundabanyanga *et al.*, 2017:934). Since individuals know that tax evasion is highly unlikely to be discovered, or underreported income that is not subject to source withholding taxes is not likely to be noticed by the revenue authorities, they might engage in unethical conduct (Nkundabanyanga *et al.*, 2017:934).

However, this economic theory is not a true representation of what a non-rational economic man might do and therefore cannot always provide a theoretically relevant framework that can be used to understand tax compliance behaviour (Nkundabanyanga *et al.*, 2017:934). The main principle and foundation of the economic deterrence theory is that rational taxpayers will take part in actions that will maximise their utility at the lowest possible cost (Otindo, 2019:8).

2.3.2 Fiscal exchange theory

The association between the services provided by the government and the taxes collected outlines the theory of fiscal exchange (Otindo, 2019:8). Therefore, tax compliance is most probably influenced by how taxpayers perceive the services provided by the government using revenue collected through taxation. Newman *et al.* (2018:12) argue that taxpayers are more inclined to comply with taxation laws if they perceived the services provided to them by government and funded by the taxes they pay to be fair.

Chisumpa, Munthali, Phiri and Matafwali (2020:4) found that taxpayers are more likely to be compliant if they perceive the government to be honest, accountable and transparent in the way the money collected from taxpayers is used. According to their findings, when taxpayers perceive that the services provided to them do not fairly reflect the taxes they pay, they are more likely to evade paying taxes.

However, it appears that if taxpayers have a positive attitude towards the ruling political party, they will comply with the tax laws put in place by that party (Sritharan & Salawati, 2019:163). Normally, if taxpayers believe that the ruling party is reliable and will provide them with the services promised to them, it makes sense that they will willingly pay taxes to increase government revenue. However, the opposite is also true: If taxpayers are dissatisfied with the services delivered by their government, they may be unwilling to comply with tax laws (Sritharan & Salawati, 2019:163).

Timothy and Abbas (2021:170) found that there is a positive relationship between the tax compliance of SMEs and the level of tax morality and trust in public authorities and their perception of justice in their country. Notably the aforementioned authors also show that among the factors stated above, tax morality had the largest magnitude with regard to its influence on tax compliance behaviour among SMEs.

Aondo and Sile (2020:26) concluded that the low level of transparency and accountability with regard to the use of resources that belong to the public potentially creates distrust in the tax system among taxpayers when they feel that officials misuse the tax revenue with which they have been entrusted. Taxpayers' willingness to pay taxes is enhanced when governments use tax revenue wisely and taxpayers can see the public goods and social amenities that are provided and maintained by tax revenue (Aondo & Sile, 2020:27).

2.3.3 Theory of planned behaviour

This theory suggests that even when the detection probability is low, taxpayers may comply with tax laws as they are influenced by psychological factors that affect their intention to comply (Olaoye, Ayeni-Agbaje & Alaran-Ajewole, 2017:135). Intention is related to a person's readiness to act in a certain way, and it is considered to be the logical precedence of behaviour (Aondo & Sile, 2020:21). Therefore, it can be stated that the intention to act translates to behaviour.

Intention is determined by three factors, namely social norms, attitude and subjective control towards that behaviour (Aondo & Sile, 2020:21). Nkundabanyanga *et al.* (2017:934) agree with Aondo and Sile and also believe that taxpayers interact with the revenue authority

based on different norms, attitudes and beliefs, and that successful tax compliance is based on their cooperation. Alm (2019:19) defines social norms as patterns of behaviour that are motivated by some level of social approval or disapproval and further states that a social norm is a self-encouraging, recognised and customary pattern of behaviour in which an individual will act in a certain manner on the assumption that others around him/her will also act in that manner.

According to Otindo (2019:9), taxpayers are influenced by social norms and are more likely to be tax compliant if the people in their social group are compliant. These social groups can also be referred to as referral groups and include family and friends, who play a vital role in the decision made by individuals to comply with tax laws (Sritharan & Salawati, 2019:163). These referral groups may influence an individual's decision to cooperate with tax authorities. Taxpayer cooperation refers to the willingness of eligible citizens to voluntarily act in accordance with the requirements of the tax law and in the spirit of compliance (Nkundabanyanga *et al.*, 2017:934). A study undertaken by Sritharan and Salawati (2019) found that religion and cultural influence also have a significant influence on taxpayers' willingness to comply with tax laws.

In summary, the abovementioned theories, which consider tax compliance behaviour from different angles, provide us with a broad sense of how taxpayers act with regard to their tax compliance behaviour.

Now that tax compliance theories have been discussed it is important, for the purpose of addressing the research objectives of this study, to review the literature on the association between demographic factors and tax compliance.

2.3.4 Demographic factors and tax compliance

Demographic factors can also influence the tax compliance behaviour of individuals. To evaluate the influence of race on tax compliance, Kasipillai and Abdul-Jabbar (2006:77) conducted a study in which Malaysian taxpayers participated. The data that was available to them included data on a number of groups, including Malaysians, Indians and Chinese. This study (Kasipillai & Abdul-Jabbar, 2006:85) found that generally there were no significant

differences between the different ethnic groups with regard to tax compliance. A similar study by Mamun *et al.* (2014:121) included the same ethnic groups studied by Kasipillai and Abdul-Jabbar and found that Malaysians demonstrated more compliant behaviour with regard to income in the form of cash than their Indian and Chinese counterparts.

A study conducted in Nigeria by Alabede (2014:48) included Igbo, Yoruba, Hausa/Fulani and other minority groups and provided evidence that cultural influence could be a plausible explanation for the difference in compliance behaviour between taxpayers from different population groups (Alabede, 2014:56).

Even taxpayers who know the right thing to do, for example those belonging to highly ethical ethnic groups, may choose to be non-compliant. Some taxpayers go to excessive lengths to avoid paying tax, for instance by:

- participating in transactions that are artificial in order to avoid tax;
- searching for every possible deduction that is legitimate which could apply to the taxpayer's situation;
- using delaying tactics in order to not declare all income already received; and
- appealing for tax assessments wherever the flow of tax payments can be reduced to reduce their liability (Nkundabanyanga *et al.*, 2017:935).

Tax non-compliance materialises when there is a positive difference between the amount of tax owed and the actual amount of tax paid (Kurniawan, 2020:58).

D'Attoma, Volintiru and Steinmo (2017) examined the effects of gender on honesty, pro-sociality, deceptive behaviour and risk aversion in the United Kingdom, Italy, the United States of America and Sweden, and found that women are notably more compliant than men in those countries. The authors also noted that those findings were consistent across all the countries included in the study as the behaviour was the same in both traditional and neutral countries.

In another study, Yimam and Asmare (2020:8) found that businesses with mainly female owners are more likely to comply with tax laws than businesses that are owned mainly by males. They also reported robust evidence which showed that the probability of tax compliance increases when female ownership in businesses increases.

Kangave, Waiswa and Sebaggala (2021:13) reported that women are more tax compliant than men this study was done in Uganda, but that the combined tax compliance rate remained low due to men tending to be non-compliant. This finding is contradicted by Shiferaw and Tesfaye (2020:991), who found that the gender of taxpayers had no impact on their level of compliance, while Mamun, Entebang, Mansor, Yasser and Nathan (2014:121) reported that female and male participants in their study showed similar compliant behaviours and attitudes.

2.4 TAX NON-COMPLIANCE

Tax non-compliance, which causes major losses in the tax revenue collected by governments, is a global problem (Alkhatib *et al.*, 2020:347). Tax authorities are concerned about non-compliant behaviour as it has an effect on tax collection which is negative and diminishes governments' ability to achieve the objectives of a prosperous society and economy (Sapiei, Kasipillai & Eze, 2014).

It should be noted that although taxes have always been the most important source of revenue for states (Shandu *et al.*, 2019:170), taxpayers still constantly search for ways in which they can avoid paying their taxes or reduce their tax liability (Shandu *et al.*, 2019:170). A lack of tax knowledge could lead to either intentional or unintentional non-compliance with taxation laws (Saad, 2014:1070).

Mohamad and Ali (2017:1) categorise non-compliance with tax requirements into two categories, namely tax avoidance and tax evasion. Tax avoidance can be seen as non-compliance as Mohamad and Ali (2017:1) define tax compliance as the willingness of a taxpayer to act in both the spirit, and according to the letter of the law to comply with tax administration requirements. Taxpayers who avoid paying taxes show an unwillingness to act within the spirit of the law.

According to Cechovsky (2021:105), tax knowledge plays a role in tax avoidance. Such knowledge enables taxpayers to do tax planning and to use their knowledge of tax legislation to reduce their tax liability through tax avoidance (Sebele-Mpofu & Chinoda, 2019:409).

Tax avoidance is a legal way to reduce tax liabilities by using certain practices that can help taxpayers to take full advantage of the tax laws applicable to them, for example by

- postponing the declaration of the income they earned;
- making use of tax arbitrage, which is the practice of profiting from differences in the way different types of income are taxed; and
- income splitting (Nkundabanyanga *et al.*, 2017:934).

Taxpayers who are knowledgeable about taxation might exploit the loopholes in the system to avoid paying their taxes (Ishola Bello & Raheed, 2020). Sebele-Mpofu and Chinoda, (2019:409) agree with Ishola Bello and Raheed (2020) that taxpayers who are better informed are also better able to take advantage of the existing loopholes in tax legislation, for example by using deductions, exemptions and tax credits to their advantage. It can therefore be stated that an increased knowledge of tax evasion opportunities has a negative effect on tax compliant behaviour (Mukasa, 2011:17).

Mohamad and Ali (2017:1) define tax avoidance as a legal activity since taxpayers will use the applicable tax laws to minimise the tax payable by them by arranging their affairs in a manner that will reduce their tax liability. "Tax avoidance is the use of legal methods to modify an individual's financial situation to lower the amount of income tax owed" (Kagan, 2018:2). This is generally accomplished when the taxpayer claims the permissible deductions and credits (Kagan, 2018: 2).

Another form of tax non-compliance is tax evasion. According to Shandu *et al.* (2019:170), tax evasion consists of, among other things, an intentional action taken by taxpayers to illegally reduce their tax obligations. It is not clear why some taxpayers still evade tax, but this tendency is often attributed to the low risk of being caught and the notion that people cannot afford to pay taxes while trying to maintain a lifestyle of luxury (Shandu *et al.*, 2019:170).

Mohamad and Ali (2017:1) define tax evasion as an illegal activity that takes place when a taxpayer contravenes the tax law by doing any one, or a combination of the following:

- Not filling in a tax return even though taxable income was earned.

- Presenting a false tax return in which income is omitted or underreported, or expenses are overstated.
- Providing false information regarding the taxpayer's tax liability.
- Misrepresenting the amount of tax liability to be declared on the tax return.

Tax evasion and tax avoidance are among the serious problems faced by different economies and have a significant negative effect on the state budget and public finances (Shandu *et al.*, 2019:170). Tax evasion and tax avoidance are the result of the economic behavioural choices made by taxpayers and are considered to be leakages in tax revenue. Such leakages prevent countries from successfully implementing their economic policies (Shandu *et al.*, 2019:170). This represents a problem from the criminal justice point of view as offenders need to be imprisoned (Shandu *et al.*, 2019:170).

Countries routinely try to combat tax evasion and reduce the leakage (Shandu *et al.*, 2019:170). In many countries tax evasion and tax avoidance evolution is currently a big problem as it is moving faster than the changes in the actual regulation of legislation (Saxunova *et al.*, 2017: 633). People who are found guilty of evading taxes are generally subjected to substantial penalties and criminal charges (Kagan, 2019:1).

2.5 TAX KNOWLEDGE

As mentioned in sections 2.3 and 2.4, which dealt with tax compliance and tax non-compliance respectively, tax knowledge can be linked to both tax compliance and non-compliance. In this study, the main research objective is concerned with the link between self-assessed tax knowledge and tax compliance.

Literature and various definitions will be used below to enhance the researcher's understanding of this association based on other researchers' findings.

Tax is defined as "a compulsory contribution to the revenue of the state levied by the government on taxpayer's income and business profits or value added to the cost of some goods, services, and transactions" (Oxford Dictionary. Not dated), while taxation is the process by which the government implements tax laws and regulations in order to benefit from taxpayers' adherence to them (Mukasa, 2011:8). Knowledge is defined as "the

theoretical or practical understanding of a particular subject and skills, facts or information that is derived from education or one's experience" (Oxford Dictionary. Not dated). Tax knowledge is the information used by taxpayers when they perform tax-related actions, such as determining, paying and documenting the amount of taxes owed to the revenue authorities (Asrinanda, 2018:544).

Tax knowledge plays a vital role in a voluntary tax compliance system (Kasippilai, 2000), in particular in the accurate calculation of tax liability (Palil, 2005). A lack of tax knowledge could lead to either intentional or unintentional non-compliance by taxpayers (Natrah, 2014:1070). Taxpayers' tax knowledge could have a considerable positive impact on their tax compliance behaviour.

All future taxpayers need to be equipped with the tax knowledge needed to ensure that they are tax literate (Mohd, 2013:120). Palil and Mustapha (2011) argue that tax knowledge impacts on tax compliance and that better knowledge of tax laws results in a higher level of tax compliance. Tax knowledge can therefore be explained as the taxpayer's level of knowledge of tax legislation and his/her ability to explain the legislation to another person.

People who have a reasonable understanding of the tax laws are more likely to be willing to comply by paying the full tax amount for which they are liable (Kasipillai, Aripin & Amran, 2013). A person's understanding of tax laws can therefore be defined as tax knowledge. Tax knowledge often leads to tax awareness as taxpayers understand the need for taxation. Compliance is enhanced when people know that taxes are used by the state to finance the provision of public goods and services (Agus, 2006:14).

We live in a digital economy, therefore taxpayers need to have sufficient tax knowledge to know when digital transactions have tax consequences. Since a lack of such knowledge will lead to tax non-compliance (Wassermann & Bornman, 2020), enhanced knowledge of how digital transactions are taxed is crucial for taxpayers.

According to Sebele-Mpofu and Chinoda (2019:408) and Mohamad and Ali (2017:1) tax knowledge refers to taxpayers' level of sensitivity to, or awareness of tax legislation, in other words, the level at which taxpayers understand the tax laws (Oladipupo & Obazee, 2016). Tax knowledge is demonstrated when tax liability is correctly calculated in terms of the applicable tax laws (Newman *et al.*, 2018:6).

Hardika, Wicaksana and Subrath (2021:101) established that knowledge and an understanding of tax regulations has a significant positive effect on tax compliance. This was confirmed by the findings of studies undertaken by Shiferaw and Tesfaye (2020) and Mukasa (2011).

It can therefore be stated that the more tax knowledge taxpayers have, the more tax compliant they are likely to be. Timothy and Abbas (2021:170) found a positive relationship between tax knowledge and tax compliance and report that the owners of SMEs who are better informed on their tax obligations and tax administrative matters than their peers have a higher compliance rate (Timothy & Abbas, 2021:170).

However, when Kasipillai *et al.* (2013) examined the association between tax knowledge and tax compliance, they found that there is a noteworthy negative association between tax knowledge and compliance. They concluded that increased knowledge of the audit process and tax regulations, for example, often enable taxpayers to evade tax. In other words, taxpayers who know and understand the tax regulations are also aware of the loopholes in the system and know how to legally reduce or even evade tax (Vikneswaran, 2016:59).

A study conducted by Nasution, Santi, Husaini, Fadli and Pirzada (2020) found that tax knowledge has no effect on tax compliance. These authors used a questionnaire to gather evidence from individual taxpayers in Indonesia. However, Sritharan and Salawati (2019:169) reported a negative correlation between individual taxpayers' tax knowledge and their tax compliance.

Tax knowledge may be influenced by several factors, including taxpayers' level of education, which is an important factor that contributes to the understanding of tax laws, especially those relating to filing and registration (Oladipupo & Obazee, 2016). Sebele-Mpofu and Chinoda (2019:409) concur with Oladipupo and Obazee (2016) as they note that the level of formal general education received by taxpayers positively influences their understanding of tax requirements.

Tambunan and Indriani (2021) report that they found that people with a low level of education had a low level of tax knowledge, which resulted in a low level of tax compliance. Sebele-

Mpofu and Chinoda (2019:412) also concluded that a significant association between tax non-compliance and inadequate tax knowledge exists.

In a study undertaken by Tambunan and Indriani (2021:3), the participants reported that their low level of education and the difficulty they consequently experienced with fulfilling their tax obligations was the main reason for their inability to comply with applicable tax laws. It can also be stated that the tax system is perceived by many as one of the most complex systems, therefore we can expect that many taxpayers will lack adequate tax knowledge (Mukasa, 2011:11).

Otindo's (2019:30) states that more knowledgeable and better educated individuals are more likely to have an attitude that is positive when reporting earnings and tend to be tax compliant, and adds that it can be assumed that as the educational level of an individual increases, so will his/her knowledge of tax matters, which should foster a positive attitude towards taxes paid to create state revenue (Otindo, 2019:31). Furthermore, Otindo (2019:8) found that taxpayers with post-secondary education are more likely to have a positive tax compliant attitude than those with no formal education, or only primary or secondary education.

The results of Sinaga's (2021:2) study indicate that partial knowledge of taxation has an insignificant influence on tax compliance of individuals, which suggests that a thorough understanding of the existing tax regulations is required to influence compliance.

Mohamad and Ali (2017:1) suggest that in order to improve tax compliance, taxpayers should be exposed to tax education studies as general education is not enough, while Kasipillai *et al.* (2013) found that tax compliance is higher among less educated taxpayers than among the well-educated. This is confirmed by Shiferaw and Tesfaye (2020:992), who found that the level of education has a significant negative effect on tax compliance and that when the level of education increased, the compliance level decreased by more than 20%.

Chisumpa *et al.* (2020:10) report that the respondents in their study strongly agreed that the tax rules and tax laws were not easily understood by the owners of SMEs, who were non-professionals with a lower level of tax education.

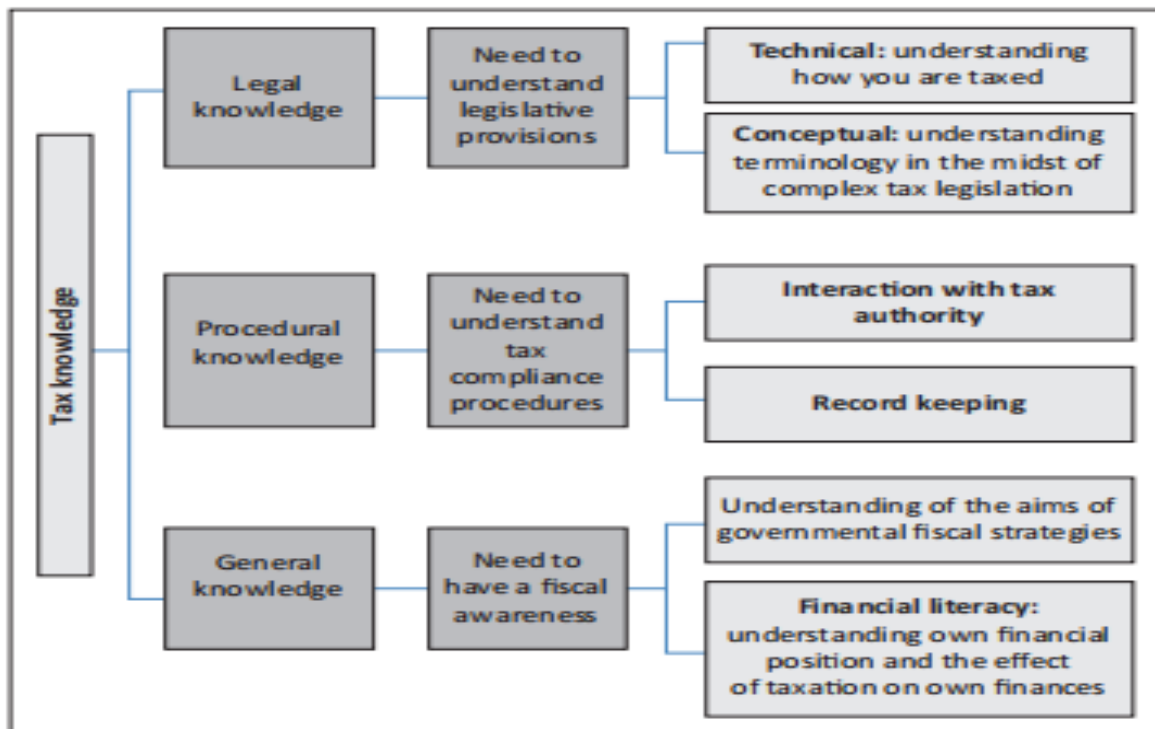
In summary, the findings of existing research concerned with the association between tax knowledge and tax compliance indicate a positive association based on a balance of probabilities. The results regarding the effect of taxpayers' educational level on their tax compliance indicate that a higher level of education usually results in more tax knowledge.

Several studies undertaken to determine the association between tax knowledge and tax compliance have measured the tax knowledge variables on an aggregate basis and have assigned an umbrella term to the various types of tax knowledge (Bornman & Ramutumbu, 2019:824).

Therefore, a gap exists in the relevant literature in respect of definitions for specific types of tax knowledge (Bornman & Ramutumbu, 2019:824). Bornman and Ramutumbu (2019:825) suggest that a framework can be used to define tax knowledge, and that tax knowledge can be divided into three main categories, namely general tax knowledge, procedural tax knowledge and legal tax knowledge.

The proposed framework for defining tax knowledge is shown in Figure 1.

Figure 1: A conceptual framework of tax knowledge



Source: Bornman, M. & Ramutumbu, P., 2019, 'A conceptual framework of taxpayer knowledge', *Meditari Accountancy Research* 27(6), 823–839.

FIGURE 1: A conceptual framework of tax knowledge.

Each of the three categories will now be discussed.

2.6 GENERAL TAX KNOWLEDGE

General tax knowledge is described as having an awareness of government revenue, especially revenue from taxes (Bornman & Ramutumbu, 2019). Awareness is defined as “concern about and well-informed interest in a particular situation or development”. (Oxford Dictionary, Not dated).

Tax awareness includes having an understanding of the purpose of the government’s fiscal policies on one’s own financial position, and their effect on one’s own finances (Bornman & Ramutumbu, 2019:828), therefore an understanding of how an individual’s personal financial position affects the financial position of the country of which he/she is a resident. Tax awareness can be enhanced by an individual exhibiting some level of tax knowledge.

In this context, tax knowledge is interpreted as the ability to make informed decisions relating to taxation and its effect on a person's finances (Bornman & Ramutumbu, 2019:829). When general fiscal knowledge is enhanced, the level of tax compliance behaviour improves as taxpayers' perception of the tax system improves (Mukasa, 2011:16). General tax knowledge includes a willingness to comply with the main principle of taxes, which means that all earnings should be declared, and the required tax should be paid over to the revenue authorities.

Bornman and Ramutumbu (2019:829) maintain that the more general tax knowledge a taxpayer has and the higher his/her financial literacy is, the better he/she will understand fiscal policies (Bornman & Ramutumbu, 2019:829).

2.7 PROCEDURAL TAX KNOWLEDGE

According to Bornman and Ramutumbu (2019:830), procedural tax knowledge is important to ensure tax compliance in countries that make use of the self-assessment system. Procedural tax knowledge can be best summarised as

- cooperating with the tax authority by paying amounts due, dealing with queries from the tax authority and submitting forms and;
- keeping the necessary records for tax record-keeping purposes, as prescribed by the tax laws (Bornman & Ramutumbu, 2019:831).

Based on their research, Aondo and Sile (2020:26) concluded that procedures for filing tax returns are too complex, which results in incorrect tax returns. They point out that many forms have to be completed every year, resulting in delays in electronic filing and payments, and that the online filing of tax returns is often quite complex for SMEs, which results in a level of tax compliance that is low.

Aondo and Sile's (2020) study shows the importance of procedural tax knowledge in relation to tax compliance. Taxpayers everywhere need to have this type of tax knowledge in order to be tax compliant.

2.8 LEGAL TAX KNOWLEDGE

Legal tax knowledge refers to the ability to apply specific tax laws and regulations to taxable income in order to correctly compute a tax liability (Bornman & Ramutumbu, 2019:829). Legal tax knowledge includes having a high level of awareness of the taxation legislation and the terminology used, and the ability to differentiate between different concepts in tax law that are applicable to the individual (Bornman & Ramutumbu, 2019:830).

Legal tax knowledge also refers to having technical knowledge of the tax legislation, which is demonstrated by the ability to correctly apply the tax laws to the taxpayer's specific situation (Bornman & Ramutumbu, 2019:830).

Many taxpayers do not understand what the tax laws mean and why tax is administered the way it is, which results in tax non-compliance (Oladipupo & Obazee, 2016). Keeping up to date with and understanding the legal aspects of taxation can be quite difficult as they are frequently changed and may then be regarded by individuals as even more complex (Bornman & Ramutumbu, 2019:829).

A study of the tax compliance of SMEs in Zimbabwe undertaken by Newman *et al.* (2018) examined the effect of tax knowledge on tax compliance and it was established that the SMEs do not comply with the tax law due to the fact that they have only the basic tax knowledge and do not have a deeper understanding of the tax knowledge relevant to their situation.

2.9 FORMULATION OF HYPOTHESES

The aim of this study is to determine the association between self-assessed tax knowledge and tax compliance. Therefore, the independent variable will be self-assessed tax knowledge and the dependent variable will be tax compliance. The aim of this study is broad and can therefore be addressed appropriately by formulating null hypotheses.

A single hypothesis cannot be used to appropriately address the objectives of this study. The reason for this is that the effect of the independent variable (self-assessed tax

knowledge) on the dependent variable (tax compliance) can also be dependent on other moderating factors, such as gender, educational level and population group.

As stated in Chapter 1, this study has one primary and three secondary research objectives.

The primary objective is:

To determine the association between self-assessed tax knowledge and tax compliance.

Based on the literature reviewed above, the following hypothesis and null hypothesis will be formulated:

H₀: There is no association between self-assessed tax knowledge and tax compliance.

H₁: There is an association between self-assessed tax knowledge and tax compliance.

The secondary research objectives that were formulated to enhance the understanding of the factors that could influence the association between self-assessed tax knowledge and tax compliance are:

1. To determine whether the association between self-assessed tax knowledge and tax compliance differs based on population group

Based on the literature reviewed, the related null hypothesis and hypothesis are:

H₀: There is no difference in the association between self-assessed tax knowledge and tax compliance based on population group.

H₁: There is a difference in the association between self-assessed tax knowledge and tax compliance based on population group.

2. To determine whether the association between self-assessed tax knowledge and tax compliance differs based on gender

H₀: There is no difference in the association between self-assessed tax knowledge and tax compliance based on gender.

H₁: There is a difference in the association between self-assessed tax knowledge and tax compliance based on gender.

3. To determine whether the association between self-assessed tax knowledge and tax compliance differs based on level of education.

H₀: There is no difference in the association between self-assessed tax knowledge and tax compliance based on level of education.

H₁: There is a difference in the association between self-assessed tax knowledge and tax compliance based on level of education.

2.10 CONCLUSION

This literature review was used to formulate the four hypotheses and null hypotheses outlined in section 2.9, the results of which will be presented in Chapter 4. Based on the literature reviewed, tax knowledge has the potential to influence tax compliance behaviour. It can therefore be hypothesised that the self-assessed tax knowledge will have a positive impact on the tax compliance behaviour of the participants.

The other variables that will be tested in relation to self-assessed tax knowledge and its influence on tax compliance are population group, gender and educational level.

Based on the review of the abovementioned literature, the following is noted: Tax compliance will differ in different population groups. Therefore, it is hypothesised that population group is a moderating factor in the association between tax compliance and self-assessed tax knowledge. Literature on the association between tax compliance and gender indicates that compliance also differs based on gender.

Evidence suggests that females tend to be more tax compliant than males. Educational level will have a positive association with tax compliance, in other words, individuals who have attained a higher level of education are likely to have a more tax compliant attitude than those with a lower level of education.

CHAPTER 3: RESEARCH METHODOLOGY AND METHOD

3.1. INTRODUCTION

In Chapter 2, four hypotheses were proposed in order to assess the association between self-assessed tax knowledge and tax compliance, and to determine whether this association is influenced by gender, population group and educational level. To test these hypotheses, a quantitative research method was applied using secondary data obtained from Monageng's (2020) research study.

This chapter explains the research methodology and design followed in this study. A discussion of the nature of the secondary data used is followed by a discussion of its validity and reliability. The manner in which the data will be analysed is discussed, followed by a brief discussion on research ethics.

3.2. RESEARCH METHODOLOGY

Research methodology refers to the approach adopted in the study to address the research problem (Monageng, 2020:94). Researchers have a choice between three research methodologies, namely the qualitative, quantitative and multiple methods approach. The qualitative research approach is associated with an interpretive manner of making sense of the phenomenon being studied by making use of meanings that are constructed in a subjective and social manner (Saunders *et al.*, 2012:163).

A quantitative research approach is used mainly to test a theory by using data and analysing the data by using a range of statistical techniques this is done by examining the associations between variables measured numerically (Saunders *et al.*, 2012:162). A multiple methods approach is a mixture of the qualitative and quantitative research approaches, which can be used in a research study by combining both approaches, for example, a quantitative method can be used to test a theory, after which the qualitative method can be used to develop a richer conclusion (Saunders *et al.*, 2012:164).

In this study, quantitative data collected using a quantitative approach was used to test the association between self-assessed tax knowledge and tax compliance. The quantitative approach is widely used in academic disciplines, including economics (Monageng, 2020:100). In taxation research, quantitative methods that have been used to study tax compliance include experiments and surveys (Monageng, 2020:100). Pham, Le, Truong and Tran (2020) conducted quantitative research to examine the determinants that influence tax compliance. Nasution *et al.* (2020) also used a quantitative approach to analyse, among other things, the effect of tax knowledge on tax compliance.

3.3. RESEARCH METHOD

As mentioned above, secondary data collected from a quantitative experimental study was used for this study. Secondary data refers to data that has already been collected for a purpose other than for the current study (Saunders *et al.*, 2012:304). Secondary data includes raw data, which is the type of data that was analysed in this study (Saunders *et al.*, 2012:304). Secondary data can be either quantitative or qualitative, or a combination of the two (Saunders *et al.*, 2012:307). For this study, quantitative secondary data was used.

The secondary data analysed in this study was collected by Monageng (2020), who used an experiment as a research method. An experiment examines the probability of a change in an independent variable that is causing a resultant change in another variable known as the dependent variable (Hakim, 2000). Monageng's (2020) experiment was conducted with student participants at the University of Pretoria and examined the effect of reciprocity nudges on tax compliance.

A total of 172 students took part in the experiment, which involved five experimental groups, four treatment groups and one control group. The sample size for each experimental group was 30 or more students (Monageng, 2020:153). Since the minimum sample size suggested for statistical analysis is 30, the sample sizes were considered to be appropriate (Saunders *et al.*, 2012:266). The experiment was conducted in the computer laboratories at the University of Pretoria (Monageng, 2020:155).

The following data was collected during the experiment:

Participants performed experimental tasks, which included watching videos and answering questions about them. Participants earned a performance-based income in laboratory currency based on the number questions they answered correctly. At the end of the experiment, they were required to declare their income earned to the revenue authority. Participants could decide how much of their earned income they would declare (if any). The amount declared was subject to 31% income tax.

The experimental design included the probability of being audited and penalties for participants who were selected for an audit and found to have under-declared their income. After making their tax compliance decisions, the participants were asked to fill in a questionnaire that included demographic questions requiring details such as gender, age and population group. Participants were also asked about their highest level of education and were requested to rate their income tax knowledge (Monageng, 2020:156).

In the current study, the data relating to the participants' self-assessed tax knowledge that was collected by using the questionnaire will be used, as well as the data relating to tax compliance status and demographic data. The data relating to tax knowledge and the demographic data is known as survey-based secondary data as it was collected by means of a questionnaire (Saunders *et al.*, 2012:310). Secondary data may be made available in enough detail to provide a data set that could sufficiently meet the research objectives of a researcher (Saunders *et al.*, 2012:310).

The questionnaire, shown in Table 3 below, contained questions and the options available.

Table 3: Questionnaire information

Question	Options available for selection
Please indicate your gender.	Male
	Female
Please indicate which population group to which you belong.	Black African
	White
	Coloured
	Indian/Asian
	Other (please specify)
What is the highest level of education you have completed? (If currently enrolled, highest qualification received)	Grade 12 (matric ¹)
	Post matric certificate
	Degree or diploma
	Postgraduate degree
	Other (please specify)
How would you rate your knowledge of income tax?	Very good
	Good
	Fair
	Poor
	Very poor

Source: Monageng (2020:268-269)

Questionnaires are commonly used in the study of tax compliance. For example, in a study by Timothy and Abbas (2021), a questionnaire was used to examine the impact of tax knowledge on tax compliance, and Agyeiwaa *et al.* (2019) used a questionnaire to gather information from individuals to analyse the influence that tax knowledge has on the tax compliance behaviour of taxpayers using the self-assessment system in Ghana.

¹ Matriculation (Matric) is the final year of high school.

In the case of this study, the responses of all the participants (the control group and four treatment groups) to the questions listed in Table 3 were analysed. Since the purpose of this study was to examine the association between self-assessed tax knowledge and tax compliance, the data related to the tax compliance status of each of the participants was also used for the purpose of this study. Monageng (2020) determined the tax compliance status of each participant by conducting a comparative analysis between the income earned and the income reported by the participants.

3.4. EVALUATING SECONDARY DATA SOURCES

Secondary data should be reviewed with the same caution as primary sourced data (Saunders *et al.*, 2012:321). Both advantages and disadvantages are associated with the use of secondary data (Saunders *et al.*, 2012:324-326). The advantages of using secondary data are:

- It is less costly to obtain secondary data.
- It results in a saving of resources as more resources would have had to be employed to obtain data from primary sources.
- A re-analysis of the secondary data could result in new discoveries.
- It could be used for comparison with primary data collected.
- It may facilitate longitudinal research.
- Comparative research studies can be undertaken if secondary data is available.

The disadvantages of using secondary data are:

- The data may have been collected for a purpose that is different from the researcher's purpose.
- There is no control over the quality of the data collected.
- Accessing the data might be difficult if it was previously collected for commercial reasons.

Furthermore, the following questions should be considered when evaluating secondary data:

- Is the data sufficient and can it be used to answer all of the research questions?
- Are the benefits of using the data resource greater than the costs associated with it?

- Is the data accessible? (Saunders *et al.*, 2012:321)

The abovementioned factors relating the evaluation of data will now be discussed.

Is the data sufficient, and can it be used to answer the research questions?

The secondary data used in this study was considered sufficient for answering the research questions as the questions posed in the questionnaire refer directly to the questions the researcher would have asked the participants while conducting her own research.

An important factor in evaluating the suitability of the data is coverage (Saunders *et al.*, 2012:323). "Coverage specifies the population from which observations for a particular topic can be drawn" (OECD, 2013). The secondary data covers a population that is large enough for statistical analysis and the data variables are present to answer the research objectives. Data that is not relevant to this study was excluded from the data analysis.

Are the benefits of using the data resource greater than the costs associated with it?

The benefit of using this data source were that no costs needed to be incurred to obtain permission to use this data. Therefore, since there were benefits and no costs, the benefits outweighed the costs.

Is the data accessible?

The data was made fully available to the researcher by the primary data collector.

The secondary data was therefore evaluated as being suitable for this research study. The validity and reliability of the secondary data will be assessed below.

3.5. VALIDITY AND RELIABILITY

Since the secondary data was collected by using an experiment, it is important to consider its validity and reliability. First, the internal and external validity will be examined as well as the content reliability, predictive validity and the reliability of the secondary data.

Internal validity is established when there is a causal association between two variables (Saunders *et al.*, 2012:193). Internal validity is important as it enables the researcher to

establish viable conclusions regarding the cause and effect of the association between the variables (Monageng, 2020:109). The internal validity of the data is enhanced if there is greater control over sample selection (Saunders *et al.*, 2012:176).

The experiment was conducted in a laboratory, which enhanced its internal validity. Validity was further increased by the fact that participants were all randomly allocated to either the control group or the treatment groups (Monageng, 2020:109).

External validity is important, since without it the conclusions deduced from the study cannot be generalised to the greater public (Monageng, 2020:109). In laboratory experiments, the external validity is often reduced as real-life situations are unlikely to be reflected by experiments carried out in laboratories (Saunders *et al.*, 2012:176).

Validity testing of the laboratory experiment that provided the secondary data was conducted as follows:

The internal validity concerns were addressed as follows:

- The experimental study included the four basic elements as outlined by Gravetter and Forzano (2009:190).
- Participants were all randomly allocated to either the control group or the treatment groups.
- The experiment was done in one sitting in order to minimise the possibility of concurrent events.
- Participants were not told that the main objective of the experiment was to analyse their tax compliance behaviour. This information was relayed to them at the debriefing session. The data collected is therefore internally valid.

The external validity concerns were addressed as follows:

- The experiment represented a general reporting environment. This environment included the fact that the participants earned income from the tasks they performed correctly. They could choose whether to declare their income (if any) and taxes were levied on declared income only (Monageng, 2020:110). This type of laboratory

experiment replicates a real-life situation, therefore the external validity of the data is enhanced.

Content validity in a questionnaire refers to the ability of the questions to provide adequate coverage of the research objectives (Saunders *et al.*, 2012:429). The questions in the questionnaire are precise in terms of providing enough data to answer the main research objective and the supporting research objectives. Thus, the content validity of the questionnaire used to obtain the secondary data is enhanced.

Predictive validity is related to the ability of the measures applied to make accurate predictions (Saunders *et al.*, 2012:429). Statistical analysis, such as correlation, is one of the predictive validity measures (Saunders *et al.*, 2012:430). In Chapter 4, statistical validity measures will be applied to the secondary data for inferential data analysis using a regression.

Reliability in research refers to data collection techniques and analytic procedures, and whether these techniques and procedures would produce findings that are consistent with the findings of another researcher, or the same if they were repeated on a different occasion (Saunders *et al.*, 2012:192). Reliability is therefore a key factor in producing quality research (Saunders *et al.*, 2012:192). The researcher will be using the SPSS for an inferential analysis from which conclusions will be derived. The SPSS is a reliable source of data analysis software.

3.6. DATA ANALYSIS

The association between self-assessed tax knowledge and tax compliance will be determined by conducting inferential analyses on the secondary data. The inferential analyses will include the use of linear regressions and moderation analysis.

A statistical software tool, SPSS Statistics, will be used to conduct the inferential analyses. Statistical software packages have several advantages, including the following:

- They contain a wide range of statistical procedures available for use.
- They can handle large amounts of data sets.

- They are user friendly as they are logical and easy to follow.
- They allow results to be extracted in easily readable tabular format.
- By testing for characteristics such as skewness and kurtosis, they allow assumption testing to be done to ensure that the assumptions on which a parametric statistical procedure is based are not violated.
- They allow tasks to be completed in a relatively short time, compared to the time required for completing statistical procedures by hand (physically).
- They allow researchers to present data in tables, charts and graphs (Leedy & Ormrod, 2014:314).

SPSS has been used to analyse data collected for tax-related studies, for example by Nkundabanyanga *et al.* (2017), who used it to analyse the responses to a questionnaire that was administered to gain an understanding of the factors that influence tax compliance. In this study, inferential and descriptive statistics will be calculated in order to obtain a better understanding of the data. Inferential statistics allow a researcher to draw inferences about a population by using a relatively small sample (Saunders *et al.*, 2012:669). Descriptive statistics are statistics that are used to describe variables (Saunders *et al.*, 2012:669; Leedy *et al.*, 2014:289).

Statistics are used mainly to assist the researcher with organising and summarising the data collected so that it can be efficiently communicated, and to guide the researcher in answering the research objectives by determining conclusions that can be derived from the results observed (Gravetter & Forzano, 2009:417).

3.7. RESEARCH ETHICS

Research ethics refers to how researchers conduct themselves with regard to the honest and respectful treatment of the data collected from participants (Monageng, 2020:112). Leedy and Ormrod (2014:106) state that most ethical issues lie within categories that include honesty when dealing with professional colleagues and the right to privacy.

In this study, ethical issues were addressed as follows:

- With regard to honesty with professional colleagues, there will be no data misrepresentation as the findings will be presented in a complete and honest manner.
- The data will not be tampered with in order to support any conclusion.
- The use of secondary data will be properly referenced in order to acknowledge the use of other researchers' data and a list of references will be included at the end of this study.
- Right to privacy will be adhered to by keeping the secondary data received from participants confidential.
- The data will be kept safe and unauthorised access will be prevented.

Before the commencement of this research study, ethical clearance was obtained from the Faculty of Economic and Management Sciences at the University of Pretoria's Research Ethics Committee.

3.8. CONCLUSION

This chapter presented a description of the research methodology and method applied to the secondary data used in this study. The evaluation of the secondary data was provided, followed by a discussion of the validity and reliability of the secondary data. The manner in which the data will be analysed was also discussed. The chapter concluded with a discussion of research ethics, which were maintained throughout this study.

CHAPTER 4: DATA ANALYSIS AND PRESENTATION

4.1. INTRODUCTION

As mentioned earlier, the main purpose of this study was to determine whether an association between self-assessed tax knowledge and tax compliance exists. The moderating effects of population group, gender and educational level will also be examined to address Hypotheses 2 to 4. The four hypotheses were proposed in Chapter 2 and Chapter 3 outlines the research methodology and method applied in this study. In this chapter the aim is to provide a quantitative data analysis of the secondary data by way of statistical analysis using SPSS.

In this chapter, a discussion of the descriptive analysis of the secondary data is followed by a discussion of the inferential analysis of the secondary data. It ends with a discussion of the conclusions based on the analyses.

4.2. DESCRIPTIVE ANALYSIS

This section contains an analysis of the descriptive secondary data relating to participants' self-assessed tax knowledge, population group, gender, and educational level.

Self-assessed tax knowledge level: The participants were given a questionnaire and were asked to rate their level of tax knowledge by using a five-point Likert scale with the following options: Very poor; Poor; Fair; Good; and Very good. See Table 4 below for descriptive data relating to self-assessed tax knowledge.

Table 4: Self-assessed tax knowledge level

Tax knowledge level	Frequency	Percent
Fair	68	39.5
Good	75	43.6
Poor	8	4.7
Very good	19	11.0
Very poor	2	1.2
Total	172	100.0

As can be seen in Table 4, the majority (54.6%) of the participants rated their tax knowledge as good or very good, while only 1.2% rated their knowledge as being very poor.

Population group: The experiment was conducted at the University of Pretoria in South Africa, which is attended by students from various population groups. Table 5 below provides descriptive data relating to population group.

Table 5: Population group

Population group	Frequency	Percentage
Black/African	130	75.6
Coloured	5	2.9
Indian	4	2.3
White	33	19.2
Total	172	100

A significant majority (75.6%) were Black Africans. Indians were the smallest population group and constituted only 2.3% of the total.

Gender: Regarding gender, there was a low representation of males (29.1%), with females making up the rest (70.9%) of the group. Data relating to gender is shown in Table 6 below.

Table 6: Gender

Gender	Frequency	Percent
Female	122	70.9
Male	50	29.1
Total	172	100.0

Educational level: The options available in the questionnaire were Grade 12 (matric²); degree or diploma; post-matric certificate; and postgraduate education. Data relating to the participants' level of education can be seen in Table 7 below.

Table 7: Educational level

Educational level	Frequency	Percentage
Degree or diploma	38	22.1
Grade 12 (Matric)	127	73.8
Postgraduate degree	3	1.7
Post-matric certificate	4	2.3
Total	172	99.9

Note that this table adds up to 99.9% due to rounding

The participants were students at the University of Pretoria and the majority were undergraduate students. Almost three quarters of the participants (73.8%) indicated Grade 12 as their highest educational qualification.

4.3. INFERENCE ANALYSIS

Inferential statistics were used in this study to allow the researcher to make inferences about the secondary data. Both linear regression and moderation analyses were used to test the hypotheses and to allow the research objectives to be answered.

² Matriculation (Matric) is the final year of high school.

4.3.1. Linear regression analysis

Linear analysis is a technique that statistical measures whether an association between two variables exists (Kumari & Yadav, 2018:33). This technique allows for the prediction of a dependent variable value based on one or multiple independent variables (Kumari & Yadav, 2018:33).

Before a simple linear regression can be performed using SPSS Version 27, the following six assumptions need to be met (Laerd variable statistics, Not dated):

- The dependent variable should be measured using a continuous scale.
- Observations must be independent.
- There should be a linear association between the dependent variable and the independent variables.
- There should be no outliers.
- There should be no multicollinearity between the independent variables.
- Residuals should be approximately normally distributed.

The assumptions were satisfied as follows:

- The dependent variable was tax compliance, which for the purpose of the linear regression was measured as the difference between income earned (continuous variable) and the income declared by the participants in the experiment. In this study, a negative difference and a 0 indicated compliance while a positive difference indicated non-compliance.
- The participants were students at the University of Pretoria and participated independent of each other, therefore the assumption of independence of observations was met.
- Regarding the dummy variables created for the knowledge variable and the linearity assumption for linear regression, dummy variables met the assumption of linearity by definition as they created two data points, and two points define a straight line.
- The values ranged between –100 and 31 for the dependent variable and no outliers were observed.
- As we were conducting a simple linear regression with only one independent variable, multicollinearity did not apply.

- Residual distribution was done and showed that the residuals were approximately normally distributed.

A linear regression was subsequently conducted using the difference between earned income and declared income as the dependent variable, and self-assessed tax knowledge as the independent variable. For the data analysis, the self-assessed tax knowledge responses ‘Very poor’ and ‘Poor’, as well as the responses for ‘Good’ and ‘Very good’ were added together to have enough respondents per category for valid analysis. This resulted in the following percentages: Fair 39.5%; Good 54.7%; and Poor 5.8%.

To obtain the three moderating variables for this study, the population was divided into Black/African and the rest (Others). The educational level was analysed as Grade 12 and the rest was aggregated in Post-matric. This resulted in the following percentages in terms of population group: Black/African 75.6% and others 24.4%, and in terms of educational level Grade 12 (73.8%) and post-matric qualification (26.2%). This was done due to the very limited number of responses in some of the original questionnaire categories.

In the linear regression analyses that follow, two dummy variables were constructed to represent the self-assessed ‘Fair’ and ‘Good’ tax knowledge and compare it to ‘Poor’ self-assessed tax knowledge. Linear regression 1 shows the results of the self-assessment of tax knowledge as ‘Fair’, compared with the self-assessment of tax knowledge as ‘Poor’. Linear regression 2 shows the results of self-assessment of tax knowledge as ‘Good’, compared with the self-assessment of tax knowledge as ‘Poor’.

Linear regression analysis 1

Table 8 shows the value of the model summary results of the first linear regression analysis.

Table 8: Model summary

Model summary				
Model	R	R square	Adjusted R square	Std error of the estimate
1	.159a	0,025	0,020	23,529

a. Predictors: (Constant), Self-assessed tax knowledge 'Fair'

The coefficient of determination, which is the R square value, is defined in relation to the dependent variable as a value that can explain the portion of the variation in the dependent variable explained by the independent variable/s (Kumari & Yadav, 2018:35). The R square value can be interpreted as follows: Where the value is +1, a perfect linear association between the variables exists (Kumari & Yadav, 2018:35).

The adjusted R squared value, which allows for the number of independent variables to be taken into account, indicates that only 2% of the variation in the tax compliance (difference between income earned and income declared) is explained by the self-assessment of tax knowledge as 'Fair', which is very weak.

The results of the analysis of variance (ANOVA) of the first linear regression analysis is presented in Table 9. The ANOVA table reports on the F test, testing the null hypothesis that the Beta coefficients do not differ from zero.

Table 9: ANOVA

ANOVAa						
Model		Sum of squares	df	Mean square	F	Sig.
1	Regression	2455,868	1	2455,868	4,436	.037b
	Residual	94111,597	170	553,598		
	Total	96567,465	171			

a. Dependent Variable: Difference between earned and declared

b. Predictors: (Constant), Self-assessed tax knowledge 'Fair'

The F test result indicated that the null hypothesis can be rejected at a 5% level of significance, therefore the beta coefficient differs from zero.

Table 10 shows the regression coefficient table for the first linear regression.

Statistical significance tests whether the independent variable is a statistically significant predictor of tax compliance level. If $p < 0.05$, it can be concluded that the coefficient is statistically significantly in relation to the dependent variable.

Table 10: Regression coefficients

Coefficients ^a						
Model		Unstandardised coefficients		Standardised coefficients	t	Significance
		B	Std. Error	Beta		
1	(Constant)	-4,654	2,307		-2,017	0,045
	Self-assessed tax knowledge 'Fair'	-7,729	3,669	-0,159	-2,106	0,037

a. Dependent Variable: Difference between earned and declared

The result indicated that the self-assessment of tax knowledge as 'Fair' is statistically significantly related to the level of tax compliance at the 5% level of significance. The association is weak and negative ($\beta=-0.159$), indicating that there is a tendency that if the tax knowledge level is indicated as 'Fair' in reference to 'Poor' (dummy variable value =1), the value of the tax compliance variable will be lower, therefore there will be a tendency to be non-tax compliant.

Linear regression analysis 2

Table 11 shows the model summary for the second linear regression analysis.

Table 11: Model summary

Model summary				
Model	R	R square	Adjusted R square	Std error of the estimate
1	.167 ^a	0,028	0,022	23,499

a. Predictors: (Constant), Self-assessed tax knowledge – Good

The adjusted R squared value indicates that only 2.28% of the change in tax compliance is explained by the change in the independent variable self-assessed tax knowledge 'Good', which is very weak. Table 12 shows the ANOVA for the second linear regression analysis.

Table 12: ANOVA

ANOVA ^a						
Model		Sum of squares	Degrees of freedom	Mean square	F	Significance
1	Regression	2690,734	1	2690,734	4,873	.029 ^b
	Residual	93876,731	170	552,216		
	Total	96567,465	171			

a. Dependent variable: Difference between income earned and income declared

b. Predictors: (Constant) self-assessed tax knowledge – Good

The F test result indicated that the null hypothesis stating that the beta coefficient does not differ significantly from zero can be rejected at a 5% level of significance. The regression coefficients of the second linear regression analysis are shown in Table 13 below.

Table 13: Regression coefficients

Coefficients ^a						
Model		Unstandardised coefficients		Standardised coefficients	t	Significance
		B	Std. Error	Beta		
1	(Constant)	-12,051	2,661		-4,529	0,000
	Self-assessed tax knowledge 'Good'	7,945	3,599	0,167	2,207	0,029

a. Dependent variable: Difference between income earned and income declared

The result indicated that statistically the self-assessed tax knowledge – 'Good' is significantly related to the level of tax compliance at the 5% level of significance. The association is weak and positive ($\beta=+0.167$), indicating that there is a tendency that if the tax knowledge level is 'Good' with reference to 'Poor' (dummy variable value = 1), the value of the tax compliance variable will be higher, therefore individuals will tend to be tax compliant.

4.3.2 Moderation analysis

Moderation analysis was considered applicable for testing Hypotheses 2 to 4 due to the significant statistical association between the self-assessed tax knowledge 'Fair' and self-assessed tax knowledge 'Good', and tax compliance (the difference between income earned and income declared). This confirms Hypothesis 1, which is that an association exists between self-assessed tax knowledge and tax compliance.

Analyses 1–3 will be moderation analyses on self-assessed tax knowledge 'Fair', while analyses 4–6 will be moderation analyses on self-assessed tax knowledge 'Good'.

Analysis 1: Is gender a moderator in the association between self-assessed tax knowledge and tax compliance?

To investigate the above, a simple moderator analysis was performed using the PROCESS macro (Hayes, 2012) in SPSS Version 27. The outcome variable for the analysis was tax compliance (the difference between income earned and income declared). The predictor variable for the analysis was self-assessed tax knowledge 'Fair'. The moderator variable for the analysis was gender. This is shown in Table 14 below.

Table 14: Moderation analysis 1 output

	Coefficient	Se	t	p	LLCI	ULCI
Constant	-5,1351	2,7308	-1,8804	,0618	-10,5263	,2560
Self-assessed tax knowledge 'Fair'	-10,1149	4,3536	-2,3233	,0214	-18,7098	-1,5200
Gender	1,6685	5,0845	,3281	,7432	-8,3693	11,7062
Int_1	8,0815	8,0586	1,0028	,3174	-7,8277	23,9907

The interaction between self-assessed tax knowledge 'Fair' and gender was found not to be statistically significant as the p value is .3174, which is larger than .05. Therefore, gender is not a moderator in the association between self-assessed tax knowledge 'Fair' and tax compliance.

Analysis 2: Is population group a moderator in the association between self-assessed tax knowledge and tax compliance?

To investigate the above, a simple moderator analysis was performed using the PROCESS macro (Hayes, 2012) in SPSS Version 27. The outcome variable for the analysis was tax compliance (the difference between income earned and income declared). The predictor variable for the analysis was self-assessed tax knowledge 'Fair'. The moderator variable for the analysis was population group. This is shown in Table 15 below.

Table 15: Moderation analysis 2 output

	Coefficient	Se	t	p	LLCI	ULCI
Constant	-7,8313	7,0056	-1,1179	,2652	-21,6616	5,9991
Self-assessed tax knowledge – Fair	-8,0596	11,5202	-,6996	,4851	-30,8026	14,6833
Population group	2,4846	5,1695	,4806	,6314	-7,7209	12,6901
Int_1	,4609	8,9373	,0516	,9589	-17,1830	18,1047

The interaction between self-assessed tax knowledge ‘Fair’ and population group was found to not be statistically significant as the p value is .9589, which is larger than .05. Therefore, population group is not a moderator in the association between self-assessed tax knowledge ‘Fair’ and tax compliance.

Analysis 3: Is educational level a moderator in the association between self-assessed tax knowledge and tax compliance?

To investigate the above, a simple moderator analysis was performed using the PROCESS macro (Hayes, 2012) in SPSS Version 27. The outcome variable for the analysis was tax compliance (the difference between earned and declared income). The predictor variable for the analysis was self-assessed tax knowledge ‘Fair’. The moderator variable for the analysis was educational level. This is shown in Table 16 below.

Table 16: Moderation analysis 3 output

	Coefficient	se	t	p	LLCI	ULCI
Constant	-2,0194	8,1912	-,2465	,8056	-18,1902	14,1515
Self-assessed tax knowledge – Fair	24,5860	18,6776	1,3163	,1899	-12,2871	61,4592
Educational level	-1,6023	4,7831	-,3350	,7381	-11,0450	7,8405
Int_1	-16,9644	10,0067	-1,6953	,0919	-36,7196	2,7908

The interaction between self-assessed tax knowledge ‘Fair’, and educational level was found to be statistically significant as the p value was .0919, which is larger than .05, but less than .1. A significance level of 10% can be used in moderator analysis, therefore this

result would be regarded as significant. Education level therefore has a moderating effect on the association between self-assessed tax knowledge 'Fair' and tax compliance level.

The conditional effect of self-assessed tax knowledge 'Fair' on tax compliance can be seen in Table 17. At level of education 1, the effect =7,6216, which is not statistically significant ($p = ,4038$, 95% C.I (-10,3539;25,5972), $p > .1$). At level of education 2, the effect = -9,3428, which is statistically significant ($p = ,0257$, 95% C.I (--17,5371; -1,1485), $p < .05$).

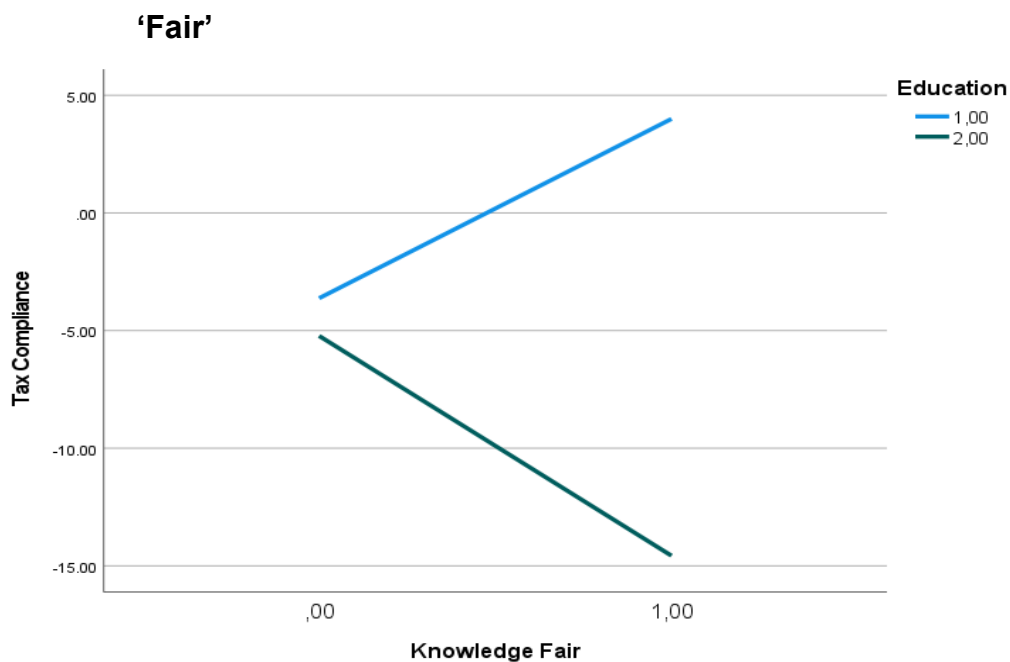
Table 17: Conditional effects of educational level on self-assessed tax knowledge 'Fair'

Educational level	Effect	se	T	p	LLCI	ULCI
1,0000 (Grade 12/Matric)	7,6216	9,1053	,8371	,4038	-10,3539	25,5972
2,0000 (Post-Matric)	- 9,3428	4,1507	-2,2509	,0257	-17,5371	-1,1485

There is thus statistical significance for the higher educational level (Post-Matric), but not for Group 1, which was the Grade 12/Matric educational level.

The graph in Figure 2 shows this conditional effect of educational group on the association between self-assessed tax knowledge 'Fair' and tax compliance. When there is no moderating effect, the lines will be parallel, but that is not the case in this graph. To better support the significance level of 0.1, this graph shows no parallel lines.

Figure 2: Conditional effects of educational level on Self-assessed tax knowledge



Self-assessed tax knowledge 'Fair' is marked as 1 and self-assessed tax knowledge 'Poor' is 0. Educational level Grade 12/Matric is represented by 1, while post-matric is represented by 2.

Tax compliance is the difference between the income earned and income declared by the participants in the experiment. In this study a negative difference and a 0 indicated compliance, while a positive difference indicated non-compliance.

The above graph shows that people who have a lower level of education and have 'Fair' self-assessed tax knowledge with reference to 'Poor' self-assessed tax are likely to be non-compliant. The graph also shows that people who have a higher level of education and have 'Fair' self-assessed tax knowledge with reference to 'Poor' self-assessed tax knowledge are likely to be tax compliant.

Analysis 4: Is gender a moderator in the association between self-assessed tax knowledge and tax compliance?

To investigate the above, a simple moderator analysis was performed using the PROCESS macro (Hayes, 2012) in SPSS Version 27. The outcome variable for the analysis was tax compliance (the difference between income earned and income declared).

The predictor variable for the analysis was self-assessed tax knowledge 'Good'. The moderator variable for the analysis was gender, as can be seen in Table 18 below.

Table 18: Moderation analysis 4 output

	Coefficient	se	T	p	LLCI	ULCI
Constant	-14,8214	3,1330	-4,7307	,0000	-21,0066	-8,6363
Self-assessed tax knowledge – 'Good'	10,5487	4,2596	2,4764	,0143	2,1394	18,9580
Gender	9,8214	5,8993	1,6649	,0978	-1,8248	21,4677
Int_1	-9,2630	7,9222	-1,1692	,2440	-24,9029	6,3770

The interaction between self-assessed tax knowledge 'Good' and gender was found to be statistically insignificant as the p value is .2440, which is larger than .05. Therefore, gender is not a moderator in the association between self-assessed tax knowledge 'Good' and tax compliance.

Analysis 5: Is population group a moderator in the association between self-assessed tax knowledge and tax compliance?

To investigate the above, a simple moderator analysis was performed using the PROCESS macro (Hayes, 2012) in SPSS Version 27. The outcome variable for the analysis was tax compliance (the difference between income earned and income declared). The predictor variable for the analysis was self-assessed tax knowledge 'Good'. The moderator variable for the analysis was population group. This is shown in Table 19 below.

Table 19: Moderation analysis 5 output

	coefficient	se	T	p	LLCI	ULCI
Constant	-18,0040	8,4094	-2,1409	,0337	-34,6058	-1,4023
Self-assessed tax knowledge – 'Good'	12,2846	11,1751	1,0993	,2732	-9,7772	34,3463
Population group	4,9395	6,6165	,7465	,4564	-8,1227	18,0017
Int_1	-3,6759	8,5662	-,4291	,6684	-20,5872	13,2353

The interaction between self-assessed tax knowledge 'Good' and population group was not found to be statistically significant as the p value is .6684, which is larger than .05. Therefore,

population group is not a moderator in the association between self-assessed tax knowledge ‘Good’ and tax compliance.

Analysis 6: Is educational level a moderator in the association between self-assessed tax knowledge – ‘Good’ and tax compliance?

To investigate the above, a simple moderator analysis was performed using the PROCESS macro (Hayes, 2012) in SPSS Version 27. The outcome variable for the analysis was tax compliance (the difference between income earned and income declared). The predictor variable for the analysis was self-assessed tax knowledge ‘Good’. The moderator variable for the analysis was level of education. This is shown in Table 20 below.

Table 20: Moderation analysis 6 output

	Coefficient	se	T	p	LLCI	ULCI
Constant	21,1515	13,7082	1,5430	,1247	-5,9111	48,2141
Self-assessed tax knowledge – ‘Good’	-25,6036	16,1900	-1,5814	,1157	-57,5657	6,3586
Educational level	-17,9848	7,2874	-2,4679	,0146	-32,3716	-3,5981
Int_1	18,1945	8,8480	2,0563	,0413	,7269	35,6621

The interaction between self-assessed tax knowledge ‘Good’, and educational level was found to be statistically significant as the p value is .0413, which is smaller than .05, therefore educational level has a moderating effect on the association between tax knowledge and tax compliance.

The conditional effect of self-assessed tax knowledge ‘Good’ on tax compliance showed corresponding results, as can be seen in Table 21. At an educational level of 1, the effect = -7,4091 and is statistically non-significant (p = ,3453, 95% C.I (-22,8629;8,0447), p>.05]. At an educational level of 2, the effect = 10,7854 and is statistically significant (p = ,0097, 95% C.I (2,6432;18,9276), p<.05].

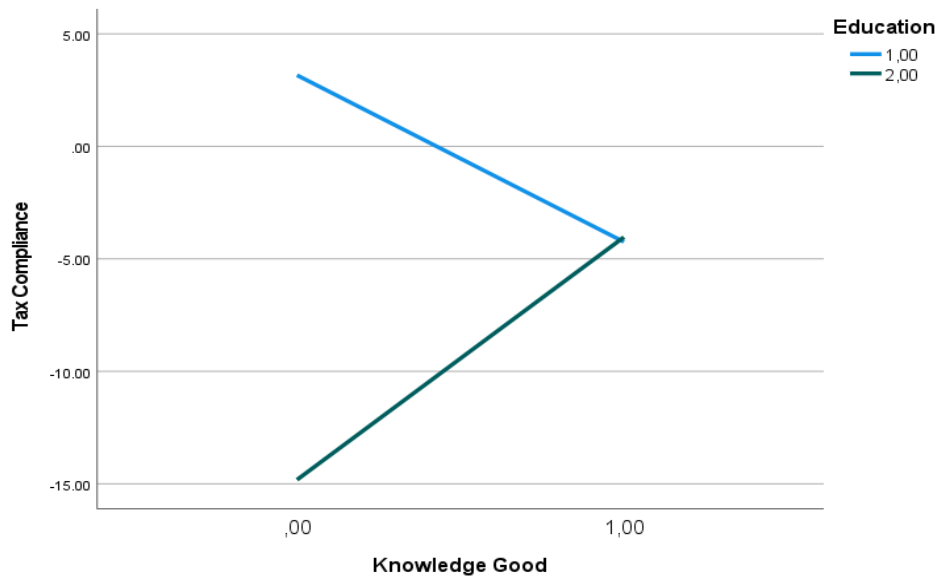
Table 21: Conditional effects of educational level on self-assessed tax knowledge 'Good'

Educational level	Effect	se	T	p	LLCI	ULCI
1,0000 (Grade 12/Matric)	-7,4091	7,8279	-,9465	,3453	-22,8629	8,0447
2,0000 (Post-Matric)	10,7854	4,1243	2,6151	,0097	2,6432	18,9276

There is a statistical significance for the higher educational level (post-matric), but not for Group 1, which was at the Grade 12/matric educational level.

The graph in Figure 3 shows this conditional effect of educational group on the association between self-assessed tax knowledge 'Good' and tax compliance.

Figure 3: Conditional effects of educational level on self-assessed tax knowledge 'Good'



Self-assessed tax knowledge 'Good' is marked as 1 and self-assessed tax knowledge 'Poor' is 0. Educational level Grade 12/Matric is represented by 1, while post-matric is represented by 2.

Tax compliance is the difference between income that was earned and income that was declared by the participants in the experiment. In this study, a negative difference and a 0 means compliance, while a positive difference means non-compliance.

This graph shows that people with a lower level of education and 'Good' self-assessed tax knowledge with reference to 'Poor' self-assessed tax are likely to be compliant. It also shows that people who have a higher level of education and have 'Good' self-assessed tax knowledge with reference to 'Poor' self-assessed tax knowledge are also likely to be compliant. Furthermore, the graph shows that more educated people will most likely declare only what they need to declare and are unlikely to over-declare. This is evident from the fact that the slope of the line representing more educated participants moves closer to 0.

4.4 DISCUSSION

In this section, the key findings of the current study will be discussed in relation to the research objectives formulated in Chapter 1 and the findings of other studies, as discussed in the literature review in Chapter 2.

The following research objectives were formulated in Chapter 1:

- To determine the association between self-assessed tax knowledge and tax compliance.
- To determine whether the association between self-assessed tax knowledge and tax compliance differs based on population group.
- To determine whether the association between self-assessed tax knowledge and tax compliance differs based on gender.
- To determine whether the association between self-assessed tax knowledge and tax compliance differs based on level of education.

These research objectives are discussed below:

4.4.1 To determine the association between self-assessed tax knowledge and tax compliance

Based on the literature reviewed, the following hypothesis and null hypothesis were formed:

H₀: There is no association between self-assessed tax knowledge and tax compliance.

H₁: There is an association between self-assessed tax knowledge and tax compliance.

In the above linear regression analyses it can be seen that, when compared with self-assessed tax knowledge 'Poor', both self-assessed tax knowledge 'Fair' and self-assessed tax knowledge 'Good' respectively, have a negative and positive weak statistically significant association with tax compliance behaviour.

These results partially agree with Shiferaw *et al.* (2020), who had findings that indicated that tax knowledge has a significant positive effect on tax compliance, and Timothy *et al.* (2021:170) who found that tax knowledge and tax compliance have a positive association in relation to each other.

Therefore Hypothesis 1 is supported by the above evidence

4.4.2 To determine whether the association between self-assessed tax knowledge and tax compliance differs based on population group

Based on the literature reviewed, the related null hypothesis and hypothesis were formulated as follows:

H₀: There is no difference in the association between self-assessed tax knowledge and tax compliance based on population group.

H₁: There is a difference in the association between self-assessed tax knowledge and tax compliance based on population group.

When this hypothesis was tested by way of moderation analysis, as shown above, population group was not found to be a moderator. This supports Kasipillai *et al.*'s (2006:85) finding that population group does not have an impact on the association between tax knowledge and tax compliance.

Therefore, the alternative hypothesis is not supported.

4.4.3 To determine whether the association between self-assessed tax knowledge and tax compliance differs based on gender

Based on the literature reviewed, the related null hypothesis and hypothesis were formulated as follows:

H₀: There is no difference in the association between self-assessed tax knowledge and tax compliance based on gender.

H₁: There is a difference in the association between self-assessed tax knowledge and tax compliance based on gender.

The hypothesis was tested by applying moderation analysis and, as shown above, gender was not found to be a moderator. This finding concurs with the findings of Shiferaw *et al.* (2020:991), who found that the taxpayers' gender had no impact on their level of compliance.

Therefore, the alternative hypothesis is not supported

4.4.4 To determine whether the association between self-assessed tax knowledge and tax compliance differs based on taxpayers' level of education

Based on the literature reviewed, the related null hypothesis and hypothesis were formulated as follows:

H₀: There is no difference in the association between self-assessed tax knowledge and tax compliance based on taxpayers' level of education.

H₁: There is a difference in the association between taxpayers' self-assessed tax knowledge and tax compliance based on education level.

As shown in all of the inferential analyses above, there is statistically significant association between self-assessed tax knowledge and tax compliance based on educational level as a moderator. In both analyses taxpayers with a level of education that is higher showed statistical significance while those at the Grade 12/Matric level did not show any significance.

The results of this study correspond with Otindo's (2019:30) findings, which showed that the more knowledgeable and educated an individual is, the greater the likelihood that he/she will have a positive attitude with regard to reporting earnings and being tax compliant. Otindo (2019:31) further states that it can be implied that as the level of education of an individual increase, so will his/her knowledge of tax matters, which will ultimately result in a positive attitude towards financially assisting in nation building. Otindo (2019:8) also found that individuals with post-secondary education are more likely to have an attitude of tax

compliance than individuals with no formal education, or with only secondary or primary education.

These results also concur with the findings of Sebele-Mpofu *et al.* (2019:409) and Oladipupo *et al.* (2016), who are of the opinion that a factor that has a positive effect on the understanding of tax requirements of taxpayers is the level of formal general education received by them.

Therefore, the alternative hypothesis is supported.

4.5. CONCLUSION

This study examined the association between self-assessed tax knowledge and tax compliance. A linear regression was done. It was shown that when compared to 'Poor' self-assessed tax knowledge, 'Good' and 'Fair' self-assessed tax knowledge play a statistically significant role in tax compliant behaviour.

Moderation analyses were done on population group, gender and educational level. The results relating to population group and gender indicated that these two variables are not statistically significant moderators of the association between 'Fair' and 'Good' self-assessed tax knowledge and tax compliance.

However, level of education, and a higher educational level (higher than Grade 12/Matric) in particular, was shown to be a moderator in both the association between 'Fair' and 'Good' self-assessed tax knowledge and tax compliance behaviour.

CHAPTER 5: CONCLUSION

5.1. INTRODUCTION

Chapter 4 included the analysis of the secondary data and a discussion of the descriptive and inferential statistics, and the results were presented and discussed. Chapter 5 concludes this study with a summary of the findings and the conclusions that were drawn, a detailed explanation of the limitations and delimitations of the study, suggestions for future related research, a discussion of the importance and benefits of this study and the assumptions made.

5.2. SUMMARY OF FINDINGS AND CONCLUSION

The main research objective of this research study was to quantitatively determine whether there is an association between self-assessed tax knowledge and tax compliance. The secondary objectives were to determine whether the gender, population group and educational level of taxpayers are moderators of the association between self-assessed tax knowledge and tax compliance. The results of this study are summarised below using the research objectives as structure and ending with the overall conclusion.

- *To determine the association between self-assessed tax knowledge and tax compliance*

The linear regression analyses revealed that participants who self-assessed their tax knowledge as 'Fair' were more likely to be non-compliant than those who self-assessed their tax knowledge as 'Poor', while participants who self-assessed their tax knowledge as 'Good' were likely to be more compliant than those who self-assessed their tax knowledge as 'Poor'. The association between fair and good self-assessed tax knowledge and tax compliance was statistically significant, which indicates an association between self-assessed tax knowledge and tax compliance.

- *To determine whether the association between self-assessed tax knowledge and tax compliance differs based on population group*

As shown in all of the inferential analyses done, population group is not a statistically significant moderating factor in the association between self-assessed tax knowledge and tax compliance.

- *To determine whether the association between self-assessed tax knowledge and tax compliance differs based on gender*

As shown in all of the inferential analyses conducted, gender is not a statistically significant moderating factor in the association between self-assessed tax knowledge and tax compliance.

- *To determine whether the association between self-assessed tax knowledge and tax compliance differs based on level of education*

All the inferential analyses conducted indicated that educational level is a statistically significant moderating factor in the association between self-assessed tax knowledge and tax compliance. In particular, the results showed that a higher educational level is a statistically significant moderator, while a lower educational level was not found to be a statistically significant moderator.

5.3 LIMITATIONS

This current study has the following limitations:

- The secondary data was obtained from research conducted in a laboratory and may therefore not represent a natural environment to which the findings can be generalised.
- The literature that was reviewed for this study was not exhaustive.
- The secondary data was obtained exclusively from university students and therefore did not provide a wide representation of the demographics of South Africa.

5.4 DELIMITATIONS

- The secondary data was collected from university students between the ages of 18 and 25 years. Since they represent the future generation of taxpayers, it was important to investigate their tax compliant behaviour.
- The secondary data was tested for reliability and validity.

5.5 FUTURE RESEARCH

Recommendations regarding further studies relating to the topic of this research are as follows:

- Since this study focused on self-assessed legal tax knowledge, future research could examine the association between general and procedural self-assessed tax knowledge and tax compliance.
- Future research could examine the association between self-assessed tax knowledge and tax compliance by involving actual taxpayers as participants, rather than students.
- Future research could explore the factors that individuals take into account when they self-assess their tax knowledge.
- For further research undertaken to determine the association between self-assessed tax knowledge and level of education, participants could be requested to provide the relevant proof to verify their level of education.

Recommendations with regard to legislation

- Legislation could be written in simpler terms to ensure that any educated person can understand it and will be able to correctly calculate his/her tax liability.

Recommendations to the community

- Taxable members of communities should attend tax education classes, if any are available, so as to be able to correctly compute their tax liability.

5.6 IMPORTANCE AND BENEFITS OF THIS STUDY

- Many taxpayers have a general education, but no specific tax education. This study explored the link between self-assessed tax knowledge and tax compliance.
- As far as could be established, this topic has not been previously researched.
- For the purpose of this study, secondary data was collected from individuals between the ages 18 and 25 years who are the future generation of taxpayers, therefore any information obtained from them will help the revenue authorities to identify trends that will help them to draft legislation that applies to them to enhance future tax compliance.

5.7 ASSUMPTIONS MADE IN THIS STUDY

- Participants in the experiment that provided the secondary data that was used paid careful attention to the questions and answered them carefully and honestly.
- The manner in which the participants conducted themselves in the laboratory experiment from which the secondary data used in this study was drawn, was similar to how they would have acted in a natural environment.

5.8 CONCLUDING REMARKS

The association between self-assessed tax knowledge and tax compliance becomes stronger as taxpayers' educational level increases. Taxpayers' gender and the population group to which they belong do not affect the association between self-assessed tax knowledge and tax compliance.

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APPENDIX A:
Declaration of plagiarism



DEPARTMENT OF TAXATION

Declaration Regarding Plagiarism

The Department of Taxation emphasises integrity and ethical behaviour with regard to the preparation of all written assignments. Although the lecturer will provide you with information regarding reference techniques, as well as ways to avoid plagiarism (see the "Guidelines on Referencing" document), you also have a responsibility to fulfil in this regard. Should you at any time feel unsure about the requirements, you must consult the lecturer concerned before submitting an assignment.

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For the period that you are a student at the Department of Taxation, the following declaration must accompany all written work that is submitted for evaluation. No written work will be accepted unless the declaration has been completed and is included in the particular assignment.

	Student
I (full names & surname):	Mashadi Suzan Nailana
Student number:	17094063

Declare the following:

1. I understand what plagiarism entails and am aware of the University's policy in this regard.
2. I declare that this assignment is my own, original work. Where someone else's work was used (whether from a printed source, the Internet or any other source) due acknowledgement was given and reference was made according to departmental requirements.
3. I did not copy and paste any information directly from an electronic source (e.g., a web page, electronic journal article or CD ROM) into this document.
4. I did not make use of another student's previous work and submitted it as my own.
5. I did not allow and will not allow anyone to copy my work with the intention of presenting it as his/her own work.

Signature