CAN CREDIT SCORES ENHANCE TAX COMPLIANCE IN SOUTH AFRICA?

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Abstract: *A compliance enhancing tax system is crucial for revenue mobilization, administrative efficiency and consequently the realization of national strategic goals. There are several factors, however, which influence a taxpayer's ability to comply with the tax system and these include economic, institutional, demographic and social factors. Against this backdrop, the primary objective of this study is to estimate taxpayers' perceptions towards credit scores and the extent to which credit scores can enhance tax compliance in South Africa. The data collection process involved self-structured questionnaires analyzed by means of descriptive statistics, inferential analysis and binary logit regression. Overall, the findings reveal that the level of educational attainment, perceptions on the state of democracy and difficulty of tax evasion are positively associated with higher probabilities of a tax compliant attitude in South Africa. By contrast, the rate of social influence was found to be negatively related with higher probabilities of a tax compliant attitude. Perceptions on credit scores (being the variable of interest) were found to be positively associated with higher probabilities of a tax compliant behavior. This, to some extent, implies that linking the tax compliance status of individual taxpayers with their credit scores is most likely to yield positive results as far as tax revenue mobilization is concerned. Given these findings, the study recommends a revision of the current credit score framework to include the tax compliance status of taxpayers as this would induce a tax compliant behavior by penalizing the credit score of non-tax compliant individuals.*

Keywords: tax compliance, credit scores, binary logistic regression, South Africa

JEL classification: H24, H26, C51, I21.

1. Introduction

Sub Saharan countries have a history of low levels of voluntary tax compliance and South Africa is no exception (Ali et al., 2013). Riedel 2009 notes that developing countries are the hardest hit by non-tax compliance and this undermines domestic tax capacity. In most cases, tax authorities have to make use of monetary penalties on corporate and individual taxpayers to encourage tax compliance. Several African countries have made efforts to increase both voluntary and non-voluntary tax compliance. For example, the South African government introduced the e-filling system to reduce administration costs and facilitate assessment processing as well as revenue collection (South African Government, 2018). A compliance enhancing tax system is crucial for revenue mobilization, administrative efficiency and the realization of national strategic goals. There are several factors however, which influence a taxpayer's ability to comply with the tax system and these include economic, institutional, demographic and social factors (Adimassu and Jerene, 2016). Taxes are known to be a compulsory contribution to/for the state, in that, there is no direct relationship between a taxpayer's contributions to the state and the extent to which the

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taxpayer receives benefits thereof in the form of public services. In the 21st century however, perceptions about government spending of public funds influence the willingness of taxpayers to settle their tax liabilities. When taxpayers feel that the government is not utilizing public funds in the most economical and efficient way, they become reluctant to pay taxes. Different schools of economic thought view tax compliance differently. For instance, the neoclassical view on tax compliance entails government intervention through the implementation of various instruments that enforce compliance such as tax audits and penalties (Pukelienė and Kažemekaitytė, 2016).
Non-tax compliance in the African continent can be evidenced by the below average tax-to-GDP ratios and high administration costs associated with the collection of taxes. Although this topic has been heavily studied, factors that influence tax compliant behavior differ from country to country and from individual to individual, hence the need for country specific studies. This study has three objectives, which are (i) to estimate taxpayer's perceptions towards credit scores, (ii) to relate credit scores with the tax compliance status and (iii) to investigate if credit scores can enhance tax compliance in South Africa. It is sufficient to note that a low tax-to-GDP ratio is not the sole indicator of non-compliance. High administration costs associated with the tax system are also an indication as well as the value of monetary tax penalties imposed on individuals and corporations. Tax amnesty and the informal sector have also gained attention (Gcabo and Robinson, 2007).
Nonetheless, the findings obtained in this study will contribute to the existing body of knowledge on tax compliance behavior by providing insights on the extent to which credit scores can induce a voluntary tax compliant behavior in South Africa. The study will likewise make a novel contribution to the economics literature by formulating a revised credit score and tax compliance framework. This will help stimulate debates on non-monetary tax penalties that can influence tax compliance. Also, linking the tax compliance framework with the credit score framework will assist in alleviating information asymmetry in the financial sector and enable financial firms to better assess credit applications based on a broader scope of factors. The use of credit scores has been steadily increasing, from being used by banks to employers and landlords. The incentive for individuals to become tax compliant will thus be high given that the majority of South African households apply for credit, employment and accommodation more frequently. The rest of the study will be arranged as follows: whereas Section 1 has provided an introduction to the study and outlined the aim and objectives of the study, Section 2 will briefly discuss literature on the determinants of tax compliance as well as a summary of findings from empirical studies. Section 3 will detail the data collection process and methods that were utilized in the study. Section 4 will briefly summarize the main findings of the study while Section 5 will comprise of the conclusion and recommendation.

2. Literature Review
This section begins by discussing the conventional determinants of tax compliance. The second leg of the section entails a discussion of empirical literature on the determinants of tax compliance.

2.1. Theoretical Literature
2.1.1. Determinants of tax behaviour
a) *Economic factors*

Economic factors include tax rates, income level, perceptions on government spending as well as tax audits. An ideal tax system is one that promotes fairness and equity. That is to say, higher income earners should face higher tax rates while lower income earners should face lower tax rates. As one moves along the income bracket, so should the level of tax rate they face. Thus, when individuals feel that their tax rate is too high, they tend to be less reluctant to pay taxes and consider avoiding and/or evading taxes. A study by Kosgei and Tenai (2014) has explored the impact of economic factors on tax compliance in Kenya. The study revealed that tax rates, fines, penalties and audits have a strong positive impact on tax compliance whereas the level of income and tax incentives have a weak positive impact on the level of tax compliance. Other studies such as Mannan et al. (2020) have found that perceptions on government spending, tax fairness and penalties have a positive and statistically significant impact on tax compliance while, on the contrary, referral groups have a negative impact on tax compliance decisions in Kenya.

b) Institutional factors

A simple tax system is one that encompasses well-defined tax regulations and processes and enables taxpayers to complete or file their tax returns without much hassle or the need for a third party (Palil, 2010, Adimassu and Jerene, 2016). The more taxpayers find it difficult to file their returns or calculate their tax liability, the less tax compliant they will be. Tax knowledge remains one of the barriers to voluntary tax compliance. Loo and McKerchar (2010) have argued that a lack of appropriate tax knowledge may lead to intentional or unintentional noncompliance behavior. It is also worth noting that unintentional compliance may be exacerbated by a lack of technological literacy since most tax systems are digitalized. Fiscal exchange also serves as an institutional determinant of tax compliance. Simply put, fiscal exchange refers to tax payments by local taxpayers in exchange for the provision of quality public services. The theory of fiscal exchange relates tax compliance with the provision of public goods and services. Bandara and Weerasooriya (2019) explain that the government can enhance the level of tax compliance by providing public goods and services more effectively and efficiently. This will instill trust in the society and improve the tax morale of corporate and individual taxpayers.

c) Social factors

Social factors include equity, fairness and certainty. These factors are based on personal judgement of the tax system as well as the environmental culture. When an individual believes that a tax system is fair and equitable, there more likely they are to be tax compliant. Simply put, equality of taxation means equality of sacrifice. An individual’s tax contributions should be in line with the income they earn and individuals within the same income bracket should face the same tax burden. Subramaniam et al. (2019) have investigated the influence of social factors such as moral, cultural, religious and ethical background on tax compliance in Malaysia by means of a multiple regression analysis. The study has found that all variables employed have a strong positive and statistically significant impact on tax compliance. A similar study by Sritharan et al. (2020) explored the effect of social factors on tax compliance in Malaysia. Having employed the multiple regression technique, the findings indicated that referral groups, changes in government policies and political affiliation are significant in explaining the tax compliant attitude of local taxpayers in Malaysia.

d) Demographic factors

Demographic factors in research include age, gender, level of education, location and race, among others. Several studies (i.e., Hasseldine and Hite, 2003; Mohamad, Mustafa and Asri, 2007) have investigated the role of gender in tax compliance. The results, however, remain ambiguous since other studies found females to be more tax compliant than males while others found males to be more tax compliant than females. Fredrick and Peter (2019) have analyzed the impact of demographic factors on tax compliance in Uganda using survey data on individual taxpayers who are small business owners. The results indicated that gender is statistically significant in explaining variations in tax compliance while education and age are statistically insignificant. A similar study by Al-Mamun et al. (2014) has examined the influence of demographic factors on tax compliance attitude in Malaysia. The study found selected demographic factors including ethnic group, gender and educational attainment to be statistically significant in explaining variations in tax compliance.

2.1.2. Revised Credit Score Framework

The proposed study attempts to link credit scores with the tax compliance status of personal income taxpayers and corporates. This will help alleviate information asymmetry by providing a greater scope of factors to be considered in assessing the credit worthiness of debtors, especially registered taxpayers given that they make use of credit facilities for several purposes, including to finance large scale assets such as vehicles and mortgage bonds. It is sufficient to note that consumers are always looking for ways to improve their credit score since good credit scores guarantee better credit offers. When consumers have a non-tax compliant status, this will negatively affect their credit record, thereby inducing them to be tax compliant. The South African Revenue Services considers four elements in the determination of the overall tax compliance status, which include tax registration, submission of annual tax returns, debt and submission of relevant supporting documents.

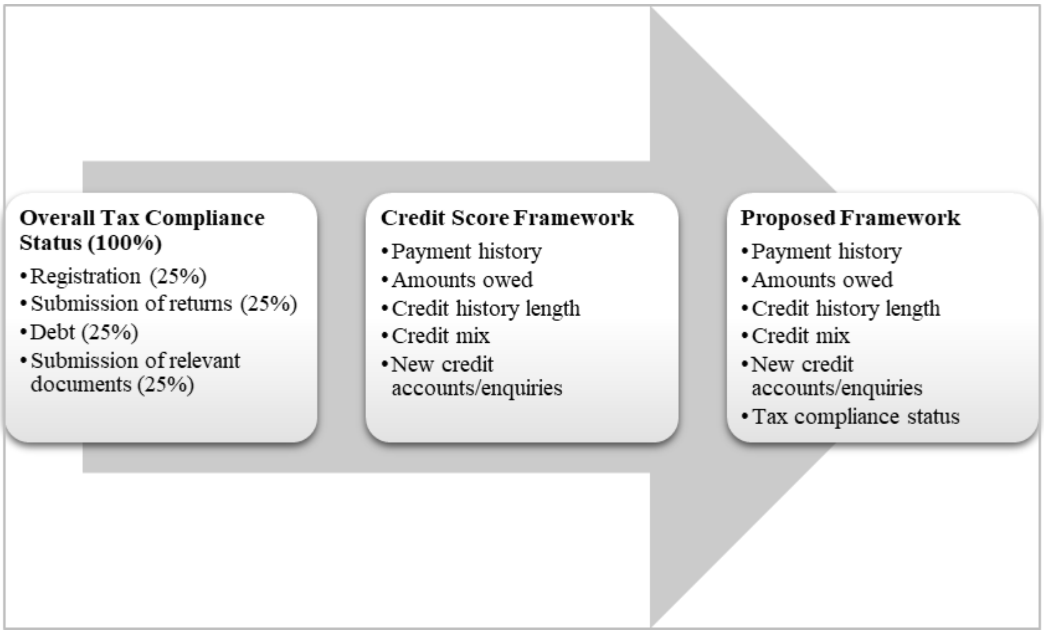

Figure 1: Proposed Credit Score Framework
Source: authors' analysis using information from Experian & SARS (2022)

The tax compliance status is particularly important to businesses trading with the government as this forms part of the minimum requirements for conducting business with the government. For personal income taxpayers, however, the tax compliance status is relatively less significant given that it is not required in most instances. This can easily induce personal income taxpayers to exhibit a non-tax compliant behavior. Thus, by linking the tax compliance status with the credit record, this will induce taxpayers to exhibit a tax compliant behavior. Furthermore, this will generate awareness about the importance of filing tax returns and maintaining a tax compliant status. The lack of tax awareness may create a backlog of outstanding tax refunds and liabilities.

2.2. Empirical Literature

This sub-section provides a detailed summary of empirical findings on the determinants of voluntary and non-voluntary tax compliance. A study by Adimassu and Jerene (2016) has assessed the influence of various economic, social, individual and institutional factors on tax-payers compliance in Ethiopia. The authors have made use of the Pearson correlation matrix and logistic regression method to analyze primary data of self-structured

questionnaires from a sample of 377 Category “A” taxpayers. The findings have revealed that perceptions on government spending, a fair and equitable tax system as well as the probability of audit, are strong determinants of tax compliance in Ethiopia.
A similar study by Bandara and Weerasooriya (2019) has made use of econometric modelling to establish the link between tax compliance and several explanatory variables in Sri Lanka. The findings have revealed that the rate of tax, tax information and taxpayers' attitude were positively correlated with tax compliance while the legal framework and cost of compliance were negatively correlated with tax compliance. The study has further revealed that the rate of tax has a negative impact on tax compliance in that an increase in the tax rate would lead to a decline in tax compliance. Furthermore, tax knowledge was found to have a positive impact on tax compliance. When information about taxes is readily and easily accessible, taxpayers become more tax compliant. By contrast, the legal framework was found to have a negative impact on tax compliance. This is because when tax laws become complex to taxpayers, their willingness and ability to be tax compliant is reduced.
Tilahun (2018) has investigated the factors influencing voluntary tax compliance behavior in Bahir Dar city. The study has revealed that factors such as individual perceptions on government spending, tax compliance costs, the level of tax rates, penalties and fairness of the tax system are significant determinants of voluntary tax compliance in Bahir Dar city. Shiferaw and Tesfaye (2020) have observed the factors influencing voluntary tax compliance behavior of Category A and B taxpayers in Ethiopia. The study has found that voluntary tax compliance is greatly influenced by demographic factors including age, level of education and gender. Also, the study has found that economic and social factors such as the tax rate, penalties, observed fairness of the tax system, absence of tax audits, tax knowledge, organizational structure and turnover as well as government spending trends significantly affect tax compliance in Ethiopia.
Pukelienė and Kažemekaitytė (2016) have scrutinized the impact of several determinants of tax(non) compliance behavior in European union countries for the period 2003 and 2014. The study finds that tax morale, social and cultural factors as well as the relationship between taxpayers and tax authorities are statistically significant in explaining variations in tax compliance. Akinboade (2015) has analyzed the factors that correlate with tax compliance in a sample of 575 small and medium companies in Cameroon. The study has revealed that time consuming processes and high compliance costs discourage tax compliance among small and medium business in Cameroon. In addition, the study revealed that perceptions on corruption and poor leadership discourage tax registration and the filling of annual returns. Sapiei, Kasipillai and Eze (2014) have investigated the factors that determine a tax compliant behavior in Malaysia with regard to corporate income tax. The findings have revealed that tax complexity, tax liability and business age discourage a tax compliant behavior in the areas of over-claiming expenses, under-reporting income and overall tax compliance.
A comparative study by Ali, Fjeldstad and Sjursen (2013) has explored the factors that determine tax compliant behavior in Kenya, South Africa, Tanzania and Uganda. The study made use of the 2011/12 Afrobarometer survey data which captures results from the national sample surveys on the reactions of citizens in selected African countries towards the state of democracy, civil society, markets and other aspects of development. The study has revealed that the provision of public goods and services is positively correlated with tax compliance in the four countries. In addition, the study has found that tax knowledge and awareness induce a tax compliant behavior among citizens in the four selected countries. On the contrary, perceptions on the unequal treatment among ethnic groups by the government as well as frequent payments to non-state actors in exchange for security were found to be negatively correlated with tax compliance. Inasius (2015) has estimated the impact of selected tax compliance variables on the tax compliant rate in a sample of 319 individual retailers in Indonesia. The selected variables have included referral groups,

perceptions on the tax rate, tax knowledge and the probability of being audited. The results have revealed that perceptions on the income tax rate have a negative impact on the tax compliant rate while perceptions of being audited, tax knowledge and referral groups have a positive impact on the tax compliance rate. These findings are in line with Laffer (2009)'s hypothesis that higher tax rates discourage taxed economic activities including investment, labor and output.
Cummings et al. (2005) have conducted laboratory experiments in different countries to explain the differences in tax compliance levels among countries. The experiments have revealed that differences in perceptions on fiscal exchange, overall attitude towards respective governments and perceptions on the fairness of tax administration can help explain differences in tax compliance levels. Chandarasorn (2012) has analyzed the determinants of tax compliance in Thailand by using a mixed methods approach comprising of face-to-face surveys with 1,148 local taxpayers and 15 face-to-face interviews with Thailand tax experts. The findings have revealed that demographic characteristics, perceptions on the fairness of the tax administration system, tax knowledge and perceptions on enforcement are major determinants of tax compliance in Thailand. Plumley (2003) has investigated the determinants of voluntary tax compliance of personal income taxpayers in Washington D.C. The findings have revealed that voluntary tax compliance is largely associated with criminal tax convictions, non-filer notices, probability of audit and marginal tax rates. Innasamy and Bidin (2017) have employed the Deterrence theory as the foundation for analyzing the occurrence of excise duty non-compliance, taking into account the tax rate, penalties and fairness of the tax system in Malaysia. The study has made use of surveys as a data collection technique in a sample of 500 excise duty offenders. The findings have revealed that perceptions on tax penalties and tax rates are positively associated with excise duty non-compliance while, on the contrary, tax fairness is negatively associated with excise duty non-compliance in Malaysia.

3. Methodology

3.1. Research approach
This study was quantitative in nature, in that the researchers made use of primary data collected by means of self-structured questionnaires. The data was examined through descriptive and inferential analysis. Although several sampling techniques exist, the most suitable sampling technique for this study was the simple probability sampling technique. Under the simple probability sampling technique, participants in the population group are sampled by a random process, usually by a random number table or random number generator (Taherdoost, 2016). The target population consisted of South African permanent residents above the age of 18 years and who are registered for income tax at SARS.

3.2. Data Analysis
The data analysis process was comprised of descriptive statistics, inferential analysis (i.e., Pearson correlation) and binary logistic regression. The techniques are explained below.

3.2.1. Descriptive analysis
Descriptive analysis forms the basis of econometric modelling as it provides a summary of the type of data the researcher is dealing with. In general terms, descriptive statistics is the process of describing the main characteristics of a dataset which can either be a representation of either the sample of the study or population at large (Sharma, 2019). There are several factors which distinguish descriptive statistics from inferential statistics. For example, descriptive statistics, unlike inferential statistics, aim to summarize information about variables while inferential statistics on the other hand, aims to explain the association

between two or more variables. In addition, while inferential statistics are based on probability theory, descriptive statistics are not.

3.2.2. Pearson Correlation test

The Pearson correlation test attempts to estimate the presence and strength of a linear relationship between two variables (Mukaka, 2012). The presence of a linear association between two variables is given by the probability value, usually at the 1%, 5% or 10% interval levels. The strength of the linear relationship between two variables is given by the coefficient value. Cohen (1988) has noted that a coefficient value below 10% indicates that there is weak linear association between two concerned variables, while a coefficient value between 10% and 30% indicates that there is a moderate linear association between two concerned variables. Any coefficient value above 50% is indicative of a strong linear association between two concerned variables. The formula for calculating the correlation coefficient for any two continuous variables is given by:

$$r = \frac{\sum_{i=1}^{n}(x_i - x)(y_i - y)}{\sqrt{[\sum_{i=1}^{n}(x_i - \bar{x})^2][\sum_{i=1}^{n}(y_i - \bar{y})^2]}} \quad (1)$$

Where x_i and y_i are values of x and y for the i_{th} individual. Mukaka (2012) has stated that one of the conditions of using the Pearson correlation test is that the variables should be normally distributed.

3.2.3. Binary Logistic Regression

The logistic regression model has been widely used by researchers (e.g., Peng et al., 2002; Mertler & Vannatta, 2005) to obtain odds ratio in the face of categorical variables. The technique aims to model the chance of an outcome based on individual characteristics (Peng et al, 2002). The technique works in a similar fashion as the linear multiple regression technique except that the outcome variable is binary (Sperandei, 2013). One advantage of using the logistic regression model over other econometric techniques is that it allows the researcher to use continuous independent variables with ease and it can handle more than two independent variables simultaneously. A simple logistic regression model can be expressed mathematically as follows:

$$log\left(\frac{\mu}{1-\mu}\right) = \alpha_1 X_1 + \alpha_2 X_2 + \ldots \alpha_n X_n \quad (2)$$

Where μ indicates the possibility of consequences for each event, α_i represents the slope coefficients associated with the reference group and the X_i independent variables. Unlike discriminant analysis, the logistic regression model does not assume that the explanatory variables are normally distributed. This technique is best situated for this study given that the response variable is binary.

3.3. Model specification

The estimation model was guided by earlier studies with a few modifications to put it in line with the objective of the study. The following model was estimated:

$$tc = \alpha_0 + \alpha_i \vartheta_t + \alpha_i \rho_t + \alpha_i \omega_t + \varepsilon_t \quad (3)$$

Where tc is a binary tax compliance variable taking a value of 1 for compliance and 0 for non-compliance, α_0 is the constant term, ϑ_t is a vector for individual level characteristics of the respondent: age, gender, education, employment status and ethnicity. ρ_t is a vector for control variables such as economic deterrence, political legitimacy, perceptions on government, social influence etc. ω_t is the variable of interest, which is perceptions on credit scores and ε_t is the idiosyncratic error term.

Table 1. Description of Variables

Gender	**Male and female**
Age	Ranging between 18 – 65 years
Level of education	No education, matric, undergraduate, postgraduate
Employment sector	Private sector, public sector, informal sector
Employment status	Employed, unemployed, self-employed
Reason for evasion	Unfair tax system, taxes are too high, government steals money, I know I won't get caught
Difficulty of evasion	Very easy, easy, neither easy nor difficult, difficult, very difficult
Fiscal exchange	Taxpayer's benefit from public services in exchange for taxes
Tax morale	If the quality of public services inspires the taxpayer to settle their tax liability
Trade-off	The trade-off between higher tax rates and quality public services or lower tax rates and poor-quality services
Social influence	If the perceived compliance of others influences the taxpayer to settle their tax liabilities
Corruption	Perceptions on the level of corruption
Trust in government	Perceptions on the trust in government
State of democracy	Perceptions on the state of democracy
Linkage	Would linking your tax compliance status with your credit record induce you to become tax compliant (yes/no)

Source: author's own computations

3.4. Ethical considerations

Fleming and Zegwaard (2018) have noted that when dealing with fundamental ethical research that involves human participation, it is important to consider the ethical dilemmas that might play out. The study and data collection instruments were designed in such a way that they take into consideration the possibility of harm to participants. In addition, the study did not pose any psychological or physical harm to participants. Further to this, the study has carried no potential for legal or social harm since no information about a participant's behavior to illegal activities or substance abuse was collected. Ethical clearance was obtained from the Wits Ethics Committee.

4. Findings and Discussions

This section discusses the various statistical tests performed in estimating taxpayers' perceptions towards credit scores. This includes descriptive analysis, statistical inference, and binary logistic regression. The Social Sciences Statistical Package (SPSS) was utilized in this regard.

4.1. Descriptive Analysis

The first point of analysis was to examine the individual characteristics of the variables including the range, mean, standard deviation and skewness of the data. The findings are provided in table 2.

Table 2. Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation	Skewness	
					Statistic	Std. Error
Tax compliance	0	1	.33	.47	.75	.19
Gender	1	3	1.65	.49	-.45	.19
Education level	1	4	2.66	.57	-1.22	.19
Age	2	7	2.87	.77	1.82	.19
Employment status	1	3	2.15	.49	.36	.19
Employment sector	2	4	2.67	.81	.66	.19
Reason for Evasion	1	4	2.72	1.11	.13	.19
Difficulty of Evasion	1	5	3.45	.96	-.15	.19
Fiscal exchange	1	2	1.63	.48	-.56	.19
Tax morale	1	2	1.16	.37	1.89	.21
Trade-off	1	2	1.65	.48	-.65	.19
Social influence	1	2	1.37	.48	.56	.19
State of Corruption	1	2	1.04	.20	4.73	.19
Trust in government	1	2	1.04	.19	4.99	.21
State of Democracy	1	2	1.27	.45	1.03	.21
Linkage	1	3	2.52	.65	-1.03	.19

Source: author's own computations

The total number of observations is 150 with the exception of several variables including reason for evasion (148), ease of evasion (148) and tax morale (133), corruption (149), trust in government (137) and state of democracy (132). All the variables have lower mean values ranging between 0 and 4 given that they are categorical variables with low ranges. In addition, the standard deviation for all the variables is low, ranging between 0 and 2. This implies that the data points are closer to the mean.

4.2. Correlation Analysis

This subsection discusses findings from the Pearson correlation test as part of inferential statistics. The outputs are presented in tables 3, 4 and 5. The first table provides correlation coefficients between tax compliance and demographic factors.

Table 3. Pearson Correlation (demographic factors)

	Tax compliance	Gender	Education	Age	Employment status	Employment sector
Tax compliance	1	-.02	.19**	-.05	-.04	-.12
Gender	-.02	1	-.05	.01	.14*	.06
Education	.19**	-.05	1	.13	-.18*	-.18*
Age	-.05	.01	.13	1	-.16*	-.06
Employment status	-.04	.14*	-.18*	-.16*	1	.74**
Employment sector	-.12	.06	-.16*	-.06	.74**	1
*Asterisks **,* denote statistical significance at the 1% and 5% level respectively*						

Source: author's own computations

Amongst all the demographic factors including gender, educational level, age, employment status and employment sector, only the level of education was found to be positively associated with tax compliance. In addition, the association was found to be statistically significant. A positive and statistically significant association was also found between gender and employment status as well as between employment sector and employment status. On the contrary, a negative correlation was established between educational level and employment sector as well as between age and employment status. Table 4 indicates the correlation between tax compliance, social and economic factors.

Table 4. Pearson Correlation (social and economic factors)

	Tax compliance	**Reason for evasion**	**Difficulty of evasion**	**Fiscal exchange**	**Tax morale**	**Trade off**	**Social influence**
Tax compliance	1	.02	.67**	-.01	.05	-.03	-.12
Reason for evasion	.02	1	.04	.01	-.19*	.05	-.05
Difficulty of evasion	.67**	.04	1	-.08	.11	.02	-.05
Fiscal exchange	-.01	.01	-.08	1	.23**	-.03	.26**
Tax morale	.05	-.19*	.11	.23**	1	.02	.25**
Trade-off	-.03	.05	.02	-.03	.02	1	.06
Social influence	-.12	-.05	-.05	.26**	.25**	.06	1
*Asterisks **,* denote statistical significance at the 1% and 5% level respectively*							

Source: author's own computations

A strong positive and statically significant correlation was found between tax compliance and difficulty of evasion, implying that individuals who find the tax system difficult to evade are most likely to be tax compliant. A similar trend was observed between tax morale and fiscal exchange, implying that taxpayers' morale increases with increased access to government services. It is worth noting that this correlation doesn't account for the quality of government services provided. In contrast, we find a negative correlation between tax morale and reasons for tax evasion, which indicates that as taxpayers have more reasons to evade taxes, their willingness to pay taxes decreases. The association was likewise found to be statistically significant. Table 5 presents the correlation between tax compliance and institutional factors.

Table 5. Pearson Correlation (institutional factors)

	Tax compliance	**Level of Corruption**	**Trust in government**	**State of Democracy**	**Linkage**
Tax compliance	1	.08	.03	.14*	.14*
Level of corruption	.08	1	.53**	.19*	-.06
Trust in government	.03	.53**	1	.23**	.022
State of democracy	.14*	.19*	.23**	1	.08
Linkage	.14*	-.06	.02	.08	1
*Asterisks **,* denote statistical significance at the 1% and 5% level respectively*					

Source: author's own computations

A positive and statistically significant association was found between the state of democracy and tax compliance. When taxpayers believe that they have the authority to deliberate and decide legislation as well as to choose governing officials or parties, they are more likely to be tax compliant given that they have vested their trust in the government of the day. Similarly, a positive and statistically significant correlation was established between tax compliance and credit scores. The link between the tax compliance status and credit scores will play a significant role in alleviating information asymmetry and providing credit assessors with a broad variety of factors that determine an individual's compliant behavior. Nonetheless, the correlation between the level of trust in government and democracy was found to be positive and statistically significant. In a democratic state, individuals have trust in the public officials that they have voted for and would thus believe in their ability to develop and execute public policies.

4.3. Binary Logistic Regression

This subsection discusses findings from the binary logistic model. This includes perceptions on the influence of credit scores in enhancing tax compliance. The results are provided in Table 6. Interestingly, the coefficient for linkage is 51.9%, which suggests that linking the tax compliance status of individual taxpayers with their credit scores is associated with higher probabilities of a tax compliant behavior. Also, the association was found to be statistically significant.

Table 6. Model 1 (demographic factors)

	B	S.E.	Wald	df	Sig.	Exp(B)
Linkage	.52	.31	2.92	1	.09*	1.68
Gender	-.10	.38	.07	1	.79	.91
Level of education	1.1	.43	5.84	1	.02**	2.82
Age	-.24	.28	.76	1	.38	.78
Employment status	.79	.67	1.38	1	.24	2.19
Employment sector	-.57	.37	2.37	1	.12	.56
Constant	-3.12	2.29	1.88	1	.17	.04
Omnibus Tests of Model Coefficients (.063) Hosmer and Lemeshow Test Sig (.830) Asterisks **,* denote statistical significance at the 5% and 10% level respectively						

Source: author's own computations

As regards demographic factors, the findings indicate that gender, age and the employment sector are negatively associated with higher probabilities of tax compliance although the coefficients were found to be statistically insignificant. In contrast, educational attainment and employment status were found to be positively associated with higher probabilities of tax compliance. Also, the coefficient for educational attainment was found to be statistically significant. This indicates that education positively influences individuals to make rational choices, including filing their returns and settling their tax liabilities. Mascagni and Santoro (2018) have likewise indicated that citizens with better tax education are able to navigate complex tax systems and can avoid overpayment due to intricate reporting requirements. They may be more encouraged to comply voluntarily. The next table presents findings from model 2, which incorporates social and institutional factors.

Table 7. Model 2 (institutional and social factors)

	B	S.E.	Wald	df	Sig.	Exp(B)
Linkage	.58	.34	2.96	1	.09**	1.79
Level of corruption	1.03	1.19	.76	1	.38	2.81
Trust in government	-.20	1.38	.02	1	.89	.81
State of democracy	.89	.47	3.60	1	.06**	2.42
Social influence	-1.15	.48	5.66	1	.01*	.32
Constant	-1.23	1.72	.51	1	.45	.29
Hosmer and Lemeshow Test Sig (.470) Omnibus Tests of Model Coefficients (.056) Asterisks *,** denote statistical significance at the 1% and 10% level respectively						

Source: author's own computation

Social influence was found to be negatively associated with probabilities of higher tax compliance and this association was found to be statistically significant. Social norms influence compliance indirectly through internalization. This finding is in line with Govind and Iyer (2016) who investigated the role of social influence on tax compliance in the United States. Nonetheless, democracy was found to be positively associated with higher probabilities of tax compliance in South Africa. This is because, in a democratic state, citizens believe that they have the authority to deliberate and decide legislation as well as to choose governing officials or parties and as a result, they are more likely to be tax compliant given that they believe in the tax framework developed by the government they voted for.

Table 8. Model 3 (economic factors)

	B	S.E.	Wald	df	Sig.	Exp(B)
Linkage	.55	.33	2.71	1	.10	1.73
Fiscal exchange	-.27	.44	.37	1	.54	.76
Tax morale	.34	.53	.42	1	.52	1.41
Trade-off	-.38	.39	.91	1	.34	.68
Constant	.04	1.71	.01	1	.98	1.04
Omnibus Tests of Model Coefficients (.471) Hosmer and Lemeshow Test Sig (.519)						

Source: author's own computations

Model 3 incorporates economic factors such as fiscal exchange and tax morale. Fiscal exchange and trade-off were found to be negatively associated with higher probabilities of tax compliance while tax morale and linkage, on the contrary, were found to be positively associated with higher probabilities of tax compliance. It is sufficient to note that all the coefficients were statistically insignificant and as such, no further discussion can be made. Lastly, the results from Model 4 are provided in table 10 below. The model incorporated other economic factors.

Table 9. Model 4 (economic factors cont.)

	B	S.E.	Wald	df	Sig.	Exp(B)
Linkage	.53	.48	1.21	1	.27	1.69
Reason for evasion	.36	.27	1.75	1	.19	1.43
Difficulty of evasion	3.26	.56	34.59	1	.00*	26.10
Constant	-16.44	3.41	23.35	1	.00*	.00
Omnibus Tests of Model Coefficients (.000) Hosmer and Lemeshow Test Sig (.000) Asterisk * denote statistical significance at the 1% level						

Source: author's own computations

While reasons for evading taxes were found to be positively associated with higher probabilities of a tax compliant behavior, the association was found to be statistically insignificant. In addition, the findings from model 4 revealed that the level of difficulty in evading taxes is positively associated with higher probabilities of a tax complaint attitude and this association was found to be statistically significant. This implies that as taxpayers find it difficult to evade taxes, they become more tax compliant.

5. Conclusion

This study was aimed at estimating taxpayers' perceptions towards credit scores and the extent to which credit scores can enhance tax compliance in South Africa. The empirical strategy of the study was largely influenced by the theoretical framework. The study was quantitative in nature, having utilized statistical analysis. The findings from the binary logistic model have revealed that educational attainment, state of democracy and difficulty of evasion are positively associated with higher probabilities of a tax compliant attitude in South Africa. In contrast, social influence was found to be negatively associated with probabilities of a higher tax compliant attitude. The findings have further revealed that linking the tax compliance status of individual taxpayers with their credit scores is positively associated with higher probabilities of a tax compliant behavior. Given these findings, the study recommends a revision of the current credit score framework to include the tax compliance status of taxpayers as this would induce a tax compliant behavior in South Africa by penalizing the credit record of non-tax compliant individuals. In order to improve their credit scores, taxpayers would ensure that they are tax compliant at all times by constantly submitting their tax returns and settling outstanding amounts.

6. Future research

Researchers may replicate the study in other countries given that the interrelations between credit scores and tax compliance have only been tested in South Africa to date. Researchers may also explore other methods and research instruments in line with the economic and institutional fundamentals of their countries.

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Bio-note

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