Public finance in South Africa: Tax compliance and behavioural responses to tax increases.

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Background: Unfavourable macro-economic and socio-economic conditions have placed South Africa's economy in a difficult fiscal situation, with rapidly growing public debt and large government deficits. This compromises service delivery in all spheres of government.

Aim: The study focused on assessing the level of tax compliance in South Africa and what factors explain the level of compliance.

Setting: World Values Survey data on South Africa were used to assess the tax side of fiscal policy, how taxpayers' response to the policy affects compliance and what matters for compliance.

Methods: Descriptive statistics and an ordered logistic model were employed on longitudinal data. The study used data from two waves, the first wave between the years 2005 and 2009 and the second wave between the years 2006 and 2016.

Results: The study revealed that the perceptions, attitudes and behaviours of South African taxpayers have generally shifted from a society that values tax compliance to a nation that justifies tax evasion. The main factors that shape perception and behaviour towards tax compliance were found to be demographic factors, the level of confidence in the government and patriotism.

Conclusion: The study recommends that cognitive and behavioural factors that shape taxpayers' choice to either comply with or evade tax need to be considered when designing and/or communicating the policy. In doing so, the framework will be well fitted into South Africa's unique socio-economic landscape, helping finance public service delivery. In summary, public service delivery needs to incorporate behavioural insights.

Contribution: The significance of understanding human behaviour in public management planning, which is given less attention, has been found to be central.

Keywords: Fiscal consolidation; tax compliance; behavioural response; tax evasion and avoidance; public service delivery.

Introduction and literature background

Tax policy is generally concerned with financing public expenditure in the most efficient and equitable way possible (Tanzi & Zee 2000); for that to happen, all economic agents must respond to tax policy in the intended way. The policy is often made with the assumption that economic agents are risk neutral, that risk preference is homogenous across all citizens and that social preferences are homogenous and generally acceptable (Concina 2014). This is a general assumption of rationality as per classical economic theory. In contrast to this assumption, considerable empirical evidence suggests that taxpayers are rather different (see Djawadi & Farh 2013; Gideon 2014; Holter, Krueger & Stepanchuk 2019), alluding to the inherent heterogeneity among taxpayers and their behaviour regarding tax policy. As a result, tax policy should take into account this possibility, which is possible through behavioural economic analysis (Alm & Kasper 2022). This angle is less studied yet critical to unlocking an understanding of tax compliance, welfare and prediction of policy effectiveness.

The strength of tax-collecting institutions has been alluded to as the panacea of the collection of tax at the required level; this was based on the enforcement – hard-handedness belief, negating the fact that taxpayers are human beings with certain behavioural traits that influence tax payments (Jimenez & Iyer 2016; Kassa 2021). Weaknesses in tax-collecting institutions, as evidenced by levels of corruption, bribery, nepotism, gross mismanagement and misuse of state

resources in developing and merging economies, have led to negative behaviours such as under-reporting, which has become more pronounced over the years (Evans, Krever & Alm 2018; Jahnke & Reinhard 2019), especially if one considers the tax system unfair (Krieger 2021; McCulloch, Moerenhout & Yang 2021). The degree of informality in tax assessments worsens the outcome in the case of developing countries (Ulyssea 2020). If not given attention, a vicious cycle forms with low-income countries remaining poor, especially countries with high inequality, where income redistribution is a guiding motive in the design of the tax system. The advent of technology does not necessary help the case, as it has proven to be a double-edged sword (Krieger 2021), calling for innovative ways of managing the tax system (Pomeranz 2015) but first understanding it better through research.

South Africa is not an exception to the aforementioned challenges and realities of its taxpayers not conforming to the rational, risk-neutral and self-saving behaviours which form the basis of classical theory assumptions. In the case of South Africa, this study employs a large sample of real taxpayers, compared to Gcabo and Robinson's (2007) work which used a sample of students (who are unlikely to be income earners or taxpayers and represent a homogeneous group of individuals). In light of such weaknesses in past studies on South Africa, Ebrahim et al. (2019) proposed a number of future studies. It is noteworthy that South Africa is one of the most diverse societies in the world, given the marked cultural differences within this 'rainbow' nation. South Africa represents many of the features of a troubled tax system such as high unemployment, shrinking tax base, increasing corruption and state capture, persistently high inequality and high levels of tax rates (Kumar 2014). Goldswain (2011) even concluded that some components of the tax system can be considered against human rights, as per the South African constitution. The South African fiscal climate has been debilitating during the most recent couple of years because of factors such as weak economic development and growth, uncertain policies and strategies and huge social burdens such as poverty and the high rate of unemployment (Brink 2018). In an attempt to counter these ills, fiscal consolidation has been carried out, but that has failed to deliver the ideal result. Fiscal consolidation is an idea that characterises the creation of techniques that are aimed at reducing budget shortfalls while restricting the accumulation of more debt (Kudrna & Tran 2018). The state uses the revenue to finance public expenditure, while the mix of tax collection and public spending add to public policy goals, such as equity, economic growth and macro-economic stability (Acheson & Lynch 2017). Tax hikes are just one side of contractionary fiscal policy, and this study discusses the factors that influence taxpayers' decisions to comply with tax policy and explores the tools that can be used to increase compliance and improve tax administration and collection by the South African Revenue Services (SARS).

In addressing tax policy issues, the field of economics is naturally motivated by economic philosophies and often neglects the subfield that focuses on the psychological, social and emotional factors that influence decision-making (Shaffer 2015). This often-neglected outlook is a significant contribution to the development discussion (Shaffer 2015). South Africa is faced with tax compliance problems that deter the collection process and thus affect revenue. South Africa's main budget deficit for the 2020–2021 fiscal year was recorded to have a shortfall of 11.2% of the gross domestic product (GDP). Although the national deficit can also be attributed to the deficit on the consolidated budget, which includes total spending by the provinces, social security funds and selected public entities, SARS also recorded that total tax revenue collections for 2020–2021 declined by 7.8%.

Because of the unequal distribution of income and the progressive South African tax system, citizens have been facing recurrent increases in taxes on already overburdened taxpayers, corruption, a lack of service delivery by the government and high unemployment (Du Preez & Stoman 2019). South Africa might have one of the best tax legislations in the world, but if taxes do not create enough revenue to finance government expenditure, suitable policy adjustments need to be implemented, and to achieve the desired fiscal consolidation outcome, tax compliance and behavioural response to tax hikes are crucial aspects for policymaking.

The 2008–2009 financial downturn has prompted record levels of public debt globally and set off huge fiscal changes. Against this backdrop, governments across the world have been making financial changes through a blend of tax increases and public spending cuts to reduce the debt–GDP ratio (Woo et al. 2013). For South Africa, GDP growth was negative in the last quarter of 2008 and peaked in the second quarter of 2009 at −7.43% (South African Reserve Bank 2010). Government debt was projected to reach 40% in 2015–2016, as per the budget review (2010). This promptly changed the expenditure plan of (for instance) cuts in expenditure, as well as broadening the tax base because it had shrunk because of weak economic growth. As a result, an increase in value-added tax (VAT) was introduced in 2018, moving from 14% to 15%. A good feature of indirect taxes such as VAT is that the payers have no room to evade tax as long as they want to consume the rated goods and services, but collectors (firms) can evade tax by not remitting to authorities. The Organization for Economic Cooperation and Development (OECD) had also advised the South African government to broaden key tax bases by reducing exemptions, deductions and tax credits (Sanchez 2017) alongside VAT increase (Khuzwayo 2014). Figure 1 shows the relationship between tax revenue and expenditure between 1992 and 2018, a relationship that fiscal consolidation seeks to improve by narrowing the divergence.

Figure 1 depicts an upward trend for the government's total expenditure. National revenue represents only taxes on income, profits and capital gains and does not include all other tax categories. Total revenue also shows an upward trend; however, tax revenue increases at a slower rate when
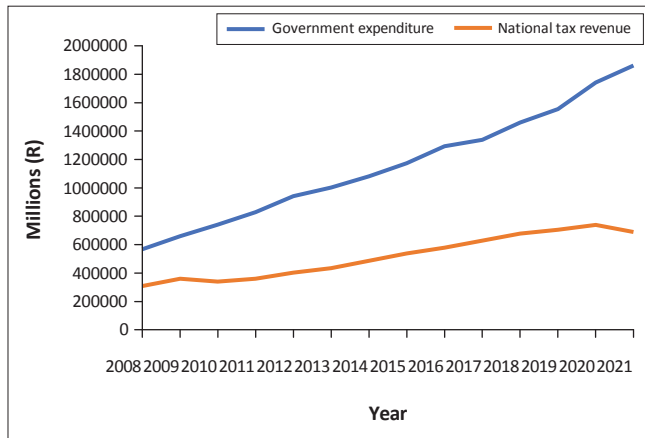
FIGURE 1: Government expenditure and annual tax revenue.

FIGURE 2: Is it justifiable to cheat on tax?

compared to government expenditure. As expected, during the period of 2008–2010, the tax revenue collected was at its lowest as a result of the global financial recession. Although there was a rise in collection from 2011 onwards, the persistent expansion in government spending, which was partly required by the severe financial crisis, has implied that there has been a shortage of revenue, and government has been overspending since the beginning of the global financial crisis (Schoeman 2015). Despite an improved outlook on tax collection, the government still faced a revenue gap of R48.2 billion in 2017–2018 (National Treasury 2018). In 2019, government spending reached a high of 36% of the GDP. This expansion reflects downward amendments to the size of the economy, spending plans that have failed and financial demands from state-owned enterprises (National Treasury 2019).

The government's contribution to development is significant, but the degree at which government uses expenditure towards the developmental project is unjustifiable and brings about high shortages to the economy's fiscus and debt accumulation (National Treasury 2019). The 2018 technical recession also led to a slow growth in revenue collections, which culminated in a downward revision of revenue targets (SARS 2019).

Figure 2, on the other hand, shows the behavioural dynamics of tax evasion that might lead to citizens not paying their tax obligations. Figure 2 shows an increase in the number of South African taxpayers stating that it is justifiable to cheat on tax; more often, the justification is the level of corruption and mismanagement of resources by government officials with little to no consequences (Dicey 2019; Manamba & Massawe 2017; Tanzi 2017), as well as a general increase in tax burden (Kurauone et al. 2020). Citizens were asked on a scale of 1–10 whether it is justifiable to cheat on tax payment (1 being 'never justifiable' and 10 being 'always justifiable'); the trend shows that over time (especially postapartheid), an increasing number of individuals feel that it is always justifiable to cheat on tax. Since 2005, the proportion of taxpayers justifying tax evasion has increased, with a projected 37% in 2019, while the proportion of taxpayers
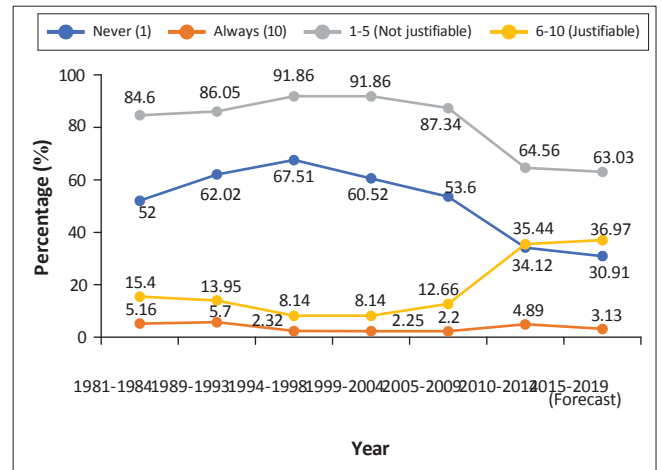
saying it is not justifiable to cheat on taxes has decreased by 65% in 2014 and 63% in 2019. Taking the extremes into account, the proportion of taxpayers who say it is never justifiable has been decreasing over time, reaching one-third of survey respondents in 2014 and projected to be around 31% by 2019.

The trend is worrying for South Africa and resonates with slow growth in revenue collected. A systems approach to interrogating the problem is required, with the starting point being to take into account behavioural factors which have been long ignored, at least in the South African case (Ebrahim et al. 2019). Two of the waves will be used to interrogate the determinants of tax compliance (belief in cheating) and responses to tax increases.

Classical versus behavioural tax theories

Literature has shown the need to depart from the traditional classical economic theory, which is hinged on rationality and that individuals are self-serving, only want the best for themselves and incorporate other beliefs as brought forth by heterodox theories. This section provides a brief and contextualised summary of these two groups of theories.

Classical tax theories

One of the fundamental presumptions of the traditional Keynesian theory is that economic growth is identified with savings when there is full employment. However, a large amount of savings may ruin economic growth, since it represents a passive type of income and is not invested into productive purposes. Keynes's tax theory argues that high progressive taxation, as is the case in South Africa where high-income earners pay a higher tax rate, is fundamental and that regressive tax rates lead to higher income inequality (Godar, Paetz & Truger 2014). Although South Africa applies the progressive tax system, income inequality remains stubbornly high (Woolard et al. 2015). New Keynesian scholars later arose and introduced the rational expectations

theory, which contended against the traditional Keynesian theory. They are of the view that citizens have heterogeneous expectations and will therefore exhibit different behaviour, for example, towards paying for the debt brought about by deficit spending through taxes (Branch & McGough 2009). The New Keynesian scholars see monetary policy as more effective than fiscal policy; as a result, this theory does not view tax as an effective tool to finance government expenditure (Kirsanova, Leith & Wren-Lewis 2009). According to this theory, if applied correctly, expansionary monetary policy would nullify deficit spending.

On the other hand, the neoclassical theory created by J. Mutt, Arthur Laffer and others states that the public authority has the commitment to eliminate obstacles to free market competition in light of the fact that the market should regulate itself without outside intervention and achieve economic equilibrium. During a period of high deficits, correctly estimating the effects of an increased tax rate is crucial, as opponents of tax increases often cite the logic employed by the Laffer curve by saying that an increase in tax rates lowers or only causes a small increase in tax revenue because people avoid taxation, which lowers the tax base (Kazman 2014). The U-shape of the Laffer curve is indicative of a unique relationship between tax rates and revenue collected. An increase in tax rates can lead to either an increase or decrease in revenue collected, depending on which point of the Laffer curve the economy is at (Naape & Mahonye 2021).

Behavioural tax theories

Behavioural theories of tax compliance have largely studied motives behind taxpayers' decisions and to explain those motives researchers have used them. The expected utility theory (EUT) states that the decision-maker picks between risky possibilities by looking at their expected utility values, that is, the weighted sum of the utility outcomes increased by their particular probabilities. While this theory accepts that taxpayers are risk takers, different possibilities have been perceived, with the analysis that the attributes of transitivity, strength and invariance do not generally apply (see Kirchler & Maciejovsky 2001; Tanzi & Shome 1993). The EUT model of tax evasion assumes that there is a negative connection between the rate of tax and the level of tax evasion. When fines are forced on the citizens who evade tax, their absolute risk aversion starts to decrease. In the 2020–2021 fiscal year, South Africa's tax revenue collections declined by 7.8% because of a number of factors, including tax evasion (South African Revenue Services 2021). Tax evasion can be a result of the lack of simplicity and accuracy of the tax legislation, high tax rates and a lack of tax integrity, among other factors, but the EUT model shows that tax evasion mainly arises from the possibility of failing to comply without greater risks (Dularif, Sutrisno & Saraswati 2019), and while SARS attempts to hold all taxpayers accountable for their obligations, there are those who self-report, earn cash-based income or have tax havens and have incentive to not report all their income (Menkhoff & Miethe 2019). Although SARS ensures that all taxable income is assessed, at the moment,

the country merely makes provision for reporting suspicious tax activity such as via a website link.

Although evidence on this inquiry is mixed and can rely on the econometric technique utilised, substantial empirical and exploratory evidence reveals a positive relationship between the rate at which taxes are paid and the level of tax evasion (Bernasconi, Corazzini & Seri 2014). Ali, Cecil and Knoblet (2001) found that people will, in general, comply less as the marginal tax rate increases, and such a tendency is more found in high-salary taxpayers than in low-income tax-payers. Another study by Pommerehne and Weck-Hannemann (1996) discovered that noncompliance is positively related to the marginal tax burden and that it is negatively related to the likelihood of a review or tax audit; however, the last effect has been discovered to be weak. The study also found that noncompliance is lower when residents or citizens have direct control over government budgets, whereas the opposite holds when there is no such control. In the EUT model, the taxpayer is thought to be risk averse, and subsequently, the EUT function has a positive marginal utility, and it is diminishing (Ameur & Tkiouat 2017).

The prospect theory is different from the EUT, and the theory has differential treatments of losses and gains regarding a reference point and applies changes to individual probabilities to overweigh all unlikely events (Trotin 2012). The prospects theory was first presented by Kahneman and Tversky (1979), and it depends on five primary ideas: dependence, reference, loss aversion, declining sensitivity, susceptibility to framing effects and nonlinear weighting of probabilities (Dhami & Al-Nowaihi 2007). Unlike the EUT, where the carriers of utility are final levels of wealth (commodities or earnings), under prospect theory, the carriers of utility are losses and gains compared to some reference points (Dhami & Al-Nowaihi 2007). Those with a preliminary tax deficit would consequently be more inclined to take the chance of noncompliance (Engström et al. 2015). Starmer and Sugden (1989) made the cumulative prospect hypothesis, which is a variation of the prospect theory. This theory applies weighting to the total probability distribution function, as in rank-dependent EUT, rather than to the probabilities of individual outcomes. Prospect theory and cumulative prospect theory have since become two of the most dominant theories, as compared to the EUT.

Behavioural factors that affect tax compliance

The psychological costs were initially recognised by Adam Smith (1776). Woellner et al. (2007) express that psychological costs are seen in the conduct of the individual who has to apply the tax law. Psychological costs are seen in the conduct of people who are expected to comply with the tax law. Their responses truly affect the time spent in compliance and even the willingness of citizens to pay taxes (Woellner et al. 2007). Research showed that South African taxpayers fear the tax authority: While some taxpayers might be non-compliant on purpose, others are afraid of making a mistake and facing fines and penalties (Van der Merwe 2018). The fear of making

a blunder comes from the expanding intricacy of and constant changes in South Africa's tax laws. This fear can thus increase in monetary costs of compliance. For instance, an individual citizen or business might not have any desire to prepare their own tax return and would prefer to pay an expert to do it, adding to their expenses.

Hashimzade et al. (2014) recognised two ideas of tax fairness: fairness towards the public authority and fairness towards other tax-paying citizens. The fiscal change theory states that compliance increases the degree to which citizens perceive that they as individuals, members from specific population categories or residents of a state obtain benefits from the government (Ali, Fjeldstad & Sjursen 2014). If public goods and services are of low quality, citizens may see tax payments as unfair (vertical reciprocity); also, if tax payments differ a great deal from one taxpayer to the next, individuals who are needed to pay larger shares of tax may see this as unfair (horizontal reciprocity) (Weber, Fooken & Herrmann 2014). Every society is vulnerable to corruption, and in any general public, tax collection assumes an essential part relating to a such activity which can be both positive and negative (Evans, Krever & Alm 2017). On the positive side, taxes can give the regulatory system and institutional foundations which can assist with destroying corrupt practices. On the negative side, corruption reduces compliance (Alm, Martinez-Vazquez & McClellan 2016). The government raises revenue to buy and offer public services to residents; in this way, vertical reciprocity, which is the connection between the public sector and the individual, enters the

theoretical idea of tax compliance (Schnellenbach 2017). Reciprocity can be defined as kindness or retaliation that depends upon the observed conduct of others (Fehr & Gächter 2000). In South Africa, Maroun, Turner and Coldwell (2014) considered tax fairness in light of capital gains tax, exploring the perception of fairness for introducing this regime with reference to the underlying policy intention. The underlying intention was to uplift the previously disadvantaged and the perceived double taxation effect thereof. The results of their study indicated that tax fairness was perceived to be a secondary point of reference when introducing a new tax policy in South Africa, which has been dominated by political agendas. Muli and Steyn (2015) found that the perception of tax fairness influences individual South African taxpayers' subjective assessment of their tax burden. Social influences shape compliance decisions, and this applies to tax payment, similar to other forms of behaviour.

In summary, theoretical literature posits that the behaviour of the taxpayer needs to be considered, as taxpayers do not just oblige but take into account and process information available and make a decision whether to comply or not.

Materials and methods

The research methodology used in this research is quantitative. Secondary data were extracted from the World Values Survey (WVS) (2005–2016), and the study used records of surveys on citizens' perceptions of tax legislation and compliance. The key variables extracted are as per Table 1.

TABLE 1: Key variables of the study and their measurements.

Variable	Indicator in the data used to measure this variable	Level of measurement (the nature of the variable)	Role played by variable in the analysis
Tax compliance	Is it justifiable to cheat on tax?	On a scale of 1–10, with 1 being not justifiable and 10 being very justifiable	Outcome (dependent variable) in model 1
Tax use – environmental care	Supportive of an increase in taxes if used to prevent environmental pollution	−4. Not asked in the survey −1. Don't know 1. Strongly agree 2. Agree 3. Disagree 4. Strongly disagree	Outcome (−4 and −1 omitted in the ordered regression analysis) – model 2
Tax use – financial aid	Willing to pay higher taxes in order to increase country's foreign aid	0- No 1- Yes	Outcome – model 3
Demographics	Gender	Male = 1; female = 2	Independent variable
	Age	16–24 = 1; 25–35 = 2; 36–45 = 3; 46–55 = 4; 56–65 = 5; 66 and above = 6	
	Ethnic group	Asian and others = 1, black people/African = 2; mixed–race = 3; white people 4	
	Education level	A scale of 1–8; with 1 being incomplete primary education and 8 being a degree or higher education	
	Employment status	Eight levels of employment status: the 1st level being full–time employed, the 8th level being others who are in other forms of employment except full-time or part-time or self-employed, for example, seasonal workers	
	Social class	Ten classes; with the upper class = 10; the lower class = 15	
	Income level	Ten steps of income; with the 1st step being low income and the 10th step being high-income earners	
Trust (social capital)	Do you have confidence in the government?	A great degree = 1; quite a lot = 2; not very much = 3; none at all = 4	Independent variables
	Trust (family members)	Completely trust = 1; trust somewhat = 2; do not trust very much = 3; do not trust at all = 4	
Patriotism	How proud are you of your nationality?	Very proud = 1; quite proud = 2; not very proud = 3; not at all proud = 4	Independent variable

Given the categorical nature of the variables, the logistic family of regression is appropriate for analysis. The logistic technique is used to model the probability of a certain class or event existing or occurring as explained by predictor variables and does not assume continuity in the dependent variable. The theoretical framework of an ordinal logistic regression model is that the outcome variable is ordered and has more than two levels (Hosmer, Lemeshow & Sturdivant 2000). The logistic regression analysis was on the level of tax compliance through the perceptions that citizens have towards tax legislation. The simple logistic model has the form:

$$\text{Logit}(Y) = \text{Natural } log\ (odds) = 1\text{n}\left\{\frac{\pi}{1-\pi}\right\} = \alpha + \beta\text{X} \qquad \text{[Eqn 1]}$$

Taking the antilog of Equation 1 on both sides, one derives an equation to predict the probability of the occurrence of the outcome of interest (tax compliance) as follows:

$$\pi = \text{Probability } (Y = \text{outcome of interest} \mid X =$$

$$x, \text{a specific value of X}) = \frac{e^{a+\beta x}}{1 + e^{a+\beta x}} \qquad \text{[Eqn 2]}$$

where π is the probability of the outcome of interest or 'event', such as the degree to which it is justifiable to cheat on taxes, α is the Y-intercept, β is the regression coefficient and e is the base of the system of natural logarithms (Peng, Lee & Ingersoll 2002). The independent variables can be categorical or continuous, but Y (dependent variable) is always categorical. In the first model, the dependent variable is justification for cheating; see Table 2 for the distribution of the variable.

According to Equation 1, the relationship between logit (Y) and X is linear, while according to Equation 2, the relationship between the probability of Y and X is nonlinear. As a result, it is necessary to make the relationship between a categorical outcome (Y) variable and its predictor(s) (X) linear by transforming the natural log of the odds in Equation 1. The value of the coefficient β determines the direction of the relationship between X and the logit of Y (Zelner 2009). Extending the logic of the simple logistic regression to multiple predictors (as it is for this study), one can construct a complex logistic regression for Y as follows:

$$\text{Logit}(Y) = \text{Natural } log\ (odds) = 1\text{n}\left\{\frac{\pi}{1-\pi}\right\} = \alpha + \beta\ X + \beta\ X_{1\ 1\ 2\ 2}$$

$$\text{[Eqn 3]}$$

Therefore:

$$\pi = \text{Probability}(Y = \text{outcome of interest} \mid X_1 = X_1, X_2 \qquad \text{[Eqn 4]}$$

$$= X_2) = \frac{e^{a+\beta 1 X 1, \beta 2\ X\ 2}}{1 + e^{a+\beta 1 X 1, \beta 2\ X\ 2}}$$

where π is once again the probability of the event, α is the Y-intercept, βs are regression coefficients and Xs are a set of predictors. In the ordered logit model, there is a continuous, unmeasured latent variable Y^*, whose values determine what the observed ordinal variable Y equals (Williams & Quiroz 2020). The continuous latent variable Y^* has various threshold points (κ is the Greek small letter kappa.) The value

of the observed variable Y depends on whether or not one has crossed a particular threshold. For example:

$$Yi = 1\ if\ Y * i\ is \leq \kappa 1\ ;\ Yi = 2\ if\ \kappa 1 \leq Y * i \leq \kappa 2\ ;$$
$$Yi = 3\ id\ Y * i \geq \kappa 2 \qquad \text{[Eqn 5]}$$

In the population, the continuous latent variable Y^* is equal to:

$$Y * i = \Sigma_{k=1}^{k} = \beta k X k i + \varepsilon i = Z i + \varepsilon i \qquad \text{[Eqn 6]}$$

Estimation techniques

The first task in estimating the model is to transform the independent variable and determine the coefficients of the independent variables (Healy 2006). The basic logistic regression analysis begins with logit transformation of the dependent variable through the utilisation of maximum likelihood estimation (MLE). Healy (2006) further puts an emphasis on the questions that the estimated model must answer. These questions range from whether a relationship exists between the independent variables as a group and dependent variable such that the independent variables within a given level of confidence actually predict the outcome, and that outcome is not a random chance, to finding the relative predictive strength of each independent variable.

The MLE is a method of estimating the parameters of a model. The method of maximum likelihood selects the set of values of the model parameters that maximises the likelihood function (Hurlin 2013). Instinctively, this maximises the 'agreement' of the selected model with the observed data (Hurlin 2013). The logit transformation is carried out using the odds ratio. The odds ratio for an event is represented as the probability of the event outcome (1 – probability of event outcome). According to McHugh (2009), the odds ratio measures the ratio of the odds that an event or result will occur to the odds of the event not happening.

The question of whether citizens found it justifiable was treated as the dependent variable, and the explanatory variables included demographics such as gender, education

TABLE 2: Summary statistics of survey participants: citizens' perceptions on tax evasion.

Justifiable: Cheating on taxes	2005–2009		2013–2016	
	Frequency	%	Frequency	%
−1. Don't know	74	**2.48**	52	1.47
1. Never justifiable	1562	**52.28**	1187	33.62
2.2	452	**15.13**	322	9.12
3.3	241	**8.07**	251	7.11
4.4	137	4.59	213	**6.03**
5.5	153	5.12	273	**7.73**
6.6	114	3.82	307	**8.69**
7.7	65	2.18	284	**8.04**
8.8	65	2.18	250	**7.08**
9.9	61	2.04	222	**6.29**
10. Always justifiable	64	**2.14**	170	4.81

Note: WVS, 2005–2016. The bold figures highlight higher values when comparing 2005–2009 versus 2013–2016 (changes in tax compliance perception over time). The perception is changing towards justifying tax non-compliance as 2005–2009 period dominated in the compliance categories, while 2013–2016 the non-compliance categories dominate.

level, ethnicity, employment status, social class and a social factor such as trust (confidence in the government and trusting family members). The study then further examined the predictor 'I am willing to pay higher taxes in order to increase country's foreign aid' (which is interpreted as altruism), containing binary responses of YES or NO, and was analysed using binary logistics. In addition, ordered logistics was also used to analyse the predictor 'I am happy with paying a higher tax to prevent environmental pollution'. The responses ranged from strongly disagree to strongly agree on a five-point Likert scale.

Data analysis, results presentation and discussion

Table 2 presents the distribution of responses on the variable of whether it is justifiable to cheat on tax (to not comply).

The frequency column (Freq.) represents the count of people with such an inclination towards cheating on taxes, and the % column shows the count as percentage of respondents that fall under a specific tax compliance category. For this variable, 1 = people who do not justify tax evasion, and 10 = people who believe that it is always justifiable to cheat on taxes. The survey results are from two waves, 2005–2009 and 2013–2016, juxtaposed for easy comparisons. The survey responses show that between 2009 and 2016, there was a growing percentage of respondents who were leaning towards justifying cheating on taxes. In the first wave (2005–2009), over 50% (52.28%) of respondents believed it was wrong to cheat on taxes, but in the second wave, only 32.62% held that perception. There are many factors that may affect this, especially considering that the WVS follows the same people at large, making its longitudinal data able to depict changes in behaviour. This shift in perception was also seen in the 2013–2016 wave, when approximately a cumulative 43% (bold values) supported cheating on taxes, and this trend was growing at an increasing rate as compared to the 2006 wave, with over 50% of participants standing against noncompliance.

Determinants of tax compliance

Table 3 presents logistic regression results, showing factors that explain the level of tax compliance measured in terms of justification of cheating on tax.

The regression results on Table 3 depict factors explaining inclination towards cheating on taxes (rating it as justifiable to cheat) by South Africans for the years 2005–2009 and 2013–2016, respectively. The explanatory variables are demographics, social capital and based on patriotism.

The impact of demographics on tax compliance behaviour

Age

Age is found to reduce the inclination towards cheating on taxes: the older one gets, the less one would justify cheating. The 2005–2009 data show that as one grows old, the odds of justifying cheating on taxes decrease by 31% for those in the

46–55 age group, 34% (56–65 age group) and 46% (66 years and above) when compared to the baseline age group of 16–24 age group. In the second wave, when compared to the baseline age group (16–24), the inclination to cheat on taxes decreased by 21% for the 36–45 age group and 24% for the 46–55 age group. The results are consistent with findings by McGee and Tyler (2007) who concluded that people become more opposed to tax evasion as they get older. The link between young people and their perception towards cheating on taxes can be justified by the fact that the majority of individuals in these groups are youth and a result might share similar views. Many young people between the age group 16 and 24 are either unemployed or students and are therefore still dependent on someone else in the older age group. As a result, some of these respondents might not know the direct impact of paying or not complying with tax. Consequently, perceptions that justify cheating on taxes breed the free rider problem in society, where individuals do not bear the cost of using common resources and public goods but can still access those resources.

Level of education

Table 3 continues to show that highly educated individuals are less willing to cheat on taxes. Education plays a role in correctly assessing the risk of tax evasion and the implications of tax avoidance on society in general (McGee 2012). Results show that in the 2005–2009 period, when compared to someone who has not completed their primary education, having a university degree decreases the odds of preferring to cheat on taxes by over 42% (1 – exponent of beta coefficient). Meanwhile, the odds to want to cheat on taxes decline to about 40% in the 2013–2016 period, implying that some individuals in this category might be starting to justify cheating on taxes.

Income

The results also reveal that the higher the income category (those in the fifth, seventh, eighth and tenth step in Table 3), the higher the chances of justifying cheating on taxes. Table 3 shows that an individual moving into the tenth step (high-income earners) is about 2.4 times (exponent of beta) more likely to justify cheating on taxes, given a positive coefficient value of 0.86. High-income earners in South Africa carry the tax burden, and as a result, changes in fiscal policy, budget and the reduced confidence in the government over the years might have influenced the change towards justifying cheating on taxes. Such group of individuals are likely to find ways of not paying more tax and take opportunities like tax avoidance (Piketty & Saez 2013), especially given their strong network of skilled consultants and generally possible high levels of education. Furthermore, because of their likely high resource endowment, high-income earners are highly mobile and can hide their wealth in tax havens, resulting in significantly lower tax contributions. This has been confirmed by Esteller, Piollato and Rablen (2017), who state that such individuals contribute significantly to the national purse, yet a 1% increase in marginal tax rate increases outmigration by 1.5% – 3%. This has already been witnessed in the case of South Africa, as reported in various media.[1]

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1.https://businesstech.co.za/news/wealth/511960/south-africas-richest-taxpayers-are-leaving-the-country/

TABLE 3: Determinants of tax compliance: Wave 2005–2009 and wave 2013–2016.

Justifiable: cheating on tax	Coefficients	Odds ratio	1-OR (%)	Standard error	Z	P > |z|	95% confidence interval
Age							
25–35	0.0103038	1.010	−1.04	0.1320561	0.08	0.938	−0.2485213 0.269129
36–45	−0.088672	0.915	8.49	0.1430755	−0.62	0.535	−0.3690948 0.1917509
46–55	−0.3760565	0.687	31.34	0.1632373	−2.30	**0.021**	−0.6959956 −0.0561173
56–65	−0.4188258	0.658	34.22	0.20098	−2.08	**0.037**	−0.8127395 −0.0249122
66 and above	−0.6119291	0.542	45.77	0.2686062	−2.28	**0.023**	−1.138388 −0.0854706
Level of education (ref: incomplete primary)							
Completed primary education	−0.0807747	0.922	7.76	0.1895982	−0.43	0.670	−0.4523803 0.2908309
Incomplete secondary school	0.1773588	1.194	−19.41	0.3605703	0.49	0.623	−0.529346 0.8840637
Completed secondary school	−0.6598139	0.517	48.31	0.2010953	−3.28	**0.001**	−1.053953 −0.2656743
Incomplete secondary	−0.3837001	0.681	31.87	0.1495421	−2.57	**0.010**	−0.6767972 −0.0906031
University – preparatory	−0.3228588	0.724	27.59	0.1641592	−1.97	**0.049**	−0.6446049 −0.0011127
Incomplete university	0.3271017			0.4870404	0.67	0.502	−0.6274803 1.281683
Degree or higher	−0.5603702	0.571	42.90	0.2187821	−2.56	**0.010**	−0.9891752 −0.1315652
Income level (ref: first step)							
Second step	0.0427127	1.044	−4.36	0.180766	0.24	0.813	−0.3115823 0.3970076
Third step	0.2973905	1.346	−34.63	0.1730932	1.72	**0.086**	−0.041866 0.636647
Fourth step	0.3195204	1.376	−37.65	0.1727226	1.85	**0.064**	−0.0190096 0.6580504
Fifth step	0.284958	1.330	−32.97	0.1689068	1.69	**0.092**	−0.0460933 0.6160092
Sixth step	0.2247146	1.252	−25.20	0.177403	1.27	0.205	−0.1229888 0.5724181
Seventh step	0.543839	1.723	−72.26	0.1811897	3.00	**0.003**	0.1887136 0.8989644
Eighth step	0.5291268	1.697	−69.74	0.1978645	2.67	**0.007**	0.1413196 0.916934
Ninth step	0.2709833	1.311	−31.13	0.312084	0.87	0.385	−0.3406901 0.8826566
Tenth step	0.8690234	2.385	−138.46	0.2995351	2.90	**0.004**	0.2819455 1.456101
Ethnic group (ref: Asian or other)							
Black people – Other and black people	−0.0524457	0.949	5.11	0.2122524	−0.25	0.805	−0.4684527 0.3635613
Mixed–race people (dark)	−0.6564835	0.519	48.13	0.2387257	−2.75	**0.006**	−1.124377 −0.1885897
White people (Caucasian)	−0.5555078	0.574	42.62	0.2209423	−2.51	**0.012**	−0.9885467 −0.1224689
Employment status (ref: full-time employed)							
Part-time	0.1282139	1.137	−13.68	0.1478808	0.87	0.386	−0.1616272 0.418055
Self-employed	0.2179477	1.244	−24.35	0.1778651	1.23	0.220	−0.1306616 0.5665569
Retired	0.1285959	1.137	−13.72	0.2118667	0.61	0.544	−0.2866551 0.5438469
Housewife	−0.4400455	0.644	35.60	0.1948875	−2.26	**0.024**	−0.8220179 −0.0580731
Students	−0.1293125	0.879	12.13	0.1721703	−0.75	0.453	−0.46676 0.208135
Unemployed	0.0820722	1.086	−8.55	0.1177763	0.70	0.486	−0.1487651 0.3129094
Other	1.798583	6.041	−504.11	1.434073	1.25	0.210	−1.012148 4.609314
Social class (ref: upper class)							
Upper middle class	−0.22285	0.800	19.98	0.2329626	−0.96	0.339	−0.6794483 0.2337484
Lower middle class	−0.0927244	0.911	8.86	0.2402049	−0.39	0.699	−0.5635173 0.3780684
Working class	−0.4930153	0.611	38.92	0.2429651	−2.03	**0.042**	−0.9692181 −0.0168125
Lower class	0.0537327	1.055	−5.52	0.2504536	0.21	0.830	−0.4371472 0.5446127
Confidence: do you have confidence in the government?							
Quite a lot	−0.020104	0.980	1.99	0.0988691	−0.20	0.839	−0.2138839 0.1736759
Not very much	0.0396298	1.040	−4.04	0.1201915	0.33	0.742	−0.1959412 0.2752008
None at all	−0.0325123	0.968	3.20	0.1662664	−0.20	0.845	−0.3583884 0.2933638
Proud of your nationality (ref: very proud)							
Quite proud	0.205158	1.228	−22.77	0.0993738	2.06	**0.039**	0.010389 0.3999271
Not very proud	0.3696533	1.447	−44.72	0.216294	1.71	**0.087**	−0.0542751 0.7935816
Not at all proud	−0.900457	0.406	59.36	0.8044942	−1.12	0.263	−2.477237 0.6763227
Trust: family members (ref: completely trust)							
Trust somewhat	0.3141698	1.369	−36.91	0.114082	2.75	**0.006**	0.0905732 0.5377664
Do not trust very much	0.5051282	1.657	−65.72	0.2976545	1.70	**0.090**	−0.0782639 1.08852
Do not trust at all	−0.2275708	0.796	20.35	0.5675809	−0.40	0.688	−1.340009 0.8848673
Age							
25–35	0.0094761	1.010	−0.95	0.1023468	0.09	0.926	−0.1911199 0.2100721
36–45	−0.2297633	0.795	20.53	0.1195018	−1.92	**0.055**	−0.4639826 0.004456
46–55	−0.2779873	0.757	24.27	0.1314529	−2.11	**0.034**	−0.5356303 −0.0203444
56–65	−0.2685624	0.764	23.55	0.1859871	−1.44	0.149	−0.6330904 0.0959656
66 and above	−0.4328754	0.649	35.14	0.2808304	−1.54	0.123	−0.9832928 0.117542

TABLE 3 (Continues...): Determinants of tax compliance: Wave 2005–2009 and wave 2013–2016.

Justifiable: cheating on tax	Coefficients	Odds ratio	1-OR (%)	Standard error	Z	P > |z|	95% confidence interval
Level of education (ref: incomplete primary)							
Completed primary education	0.2455261	1.278	−27.83	0.2422387	1.01	0.311	−0.2292531 0.7203053
Incomplete secondary school	0.1410788	1.152	−15.15	0.2309531	0.61	0.541	−0.311581 0.5937386
Completed secondary school	0.3434482	1.410	−40.98	0.2311407	1.49	0.137	−0.1095793 0.7964757
Incomplete secondary	0.0731861	1.076	−7.59	0.2109194	−0.35	0.729	−0.4865806 0.3402084
University – preparatory	−0.0663242	0.936	6.42	2123279	−0.31	0.755	−0.4824793 0.3498308
Incomplete university	0.0370698	1.038	−3.78	0.25442	0.15	0.884	−0.4615843 0.5357239
Degree or higher	−0.5084135	0.601	39.86	0.2644013	−1.92	**0.054**	−1.026631 0.0098035
Income level (ref: first step)							
Second step	0.0545335	1.056	−5.60	0.1984708	0.27	0.783	−0.3344621 0.4435291
Third step	−0.0031452	0.997	0.31	0.1668603	0.97	0.331	−0.1649221 0.4891583
Fourth step	0.2748139	1.316	−31.63	0.1625291	3.46	**0.001**	0.2432301 0.8803324
Fifth step	0.0147499	1.015	−1.49	0.1544857	3.57	**0.000**	0.2491109 0.8546837
Sixth step	−0.1496937	0.861	13.90	0.1570905	5.46	**0.000**	0.5491805 1.164964
Seventh step	−0.2329024	0.792	20.78	0.1626819	7.14	**0.000**	0.8426799 1.480381
Eighth step	−0.0941405	0.910	8.98	0.1699916	8.04	**0.000**	1.032758 1.699113
Ninth step	−0.5978772	0.550	45.00	0.2256155	5.09	**0.000**	0.7062077 1.590604
Tenth step	−0.8916393	0.410	59.00	0.2614086	7.15	**0.000**	1.357666 2.382368
Ethnic group (ref: Asian or other)							
Black people – Other and black people	−0.3295042	0.719	28.07	0.1289227	−6.44	**0.000**	−1.083102 −0.577734
Mixed–race people (dark)	−0.4681446	0.626	37.38	0.1221121	−3.88	**0.000**	−0.712949 −0.2342783
White people (Caucasian)	−0.0528794	0.948	5.15	0.2018066	−2.82	**0.005**	−0.9636214 −0.1725539
Employment status (ref: full-time employed)							
Part-time	−0.1243909	0.883	11.70	1077.127	−0.01	0.989	−2126.34 2095.919
Self-employed	−0.3388157	0.713	28.74	0.1399482	0.47	0.639	−0.2086545 0.3399325
Retired	−0.0074812	0.993	0.75	0.1891994	−2.29	**0.022**	−0.8036494 −0.0620012
Housewife	0.1722616	1.188	−18.80	0.2068269	0.99	0.323	−0.2010837 0.6096627
Students	−0.2120765	0.809	19.11	0.1487998	−0.75	0.456	−0.4026614 0.180623
Unemployed	−0.1405241	0.869	13.11	0.1529232	−2.19	**0.029**	−0.6338841 0.0344363
Other	14.42991	1848546.107	−184854510.70	0.0929379	−0.58	0.560	−0.2363899 0.1279201
Social class (ref: upper class)							
Upper middle class	−0.0906746	0.913	8.67	0.2492359	−0.20	0.842	−0.5381915 0.4387954
Lower middle class	−0.3349902	0.715	28.47	0.2555293	−0.65	0.518	−0.6659404 0.335716
Working class	−0.229017	0.795	20.47	0.2525636	−1.80	**0.072**	−0.9493295 0.0407015
Lower class	0.106348	1.112	−11.22	0.2570495	−0.92	0.358	−0.740033 0.2675825
Confidence: do you have confidence in the government?							
Quite a lot	0.2225118	1.249	−24.92	0.1034928	−1.67	**0.095**	−0.3756996 0.0299849
Not very much	0.5922905	1.808	−80.81	0.1059289	−5.39	**0.000**	−0.7782031 −0.3629693
None at all	0.7085155	2.031	−103.10	0.1182309	−3.72	**0.000**	−0.6715623 −0.2081056
Proud of your nationality (ref: very proud)							
Quite proud	0.0910151	1.095	−9.53	0.0742962	4.68	**0.000**	0.2018026 0.4930382
Not very proud	0.119643	1.127	−12.71	0.1280888	3.95	**0.000**	0.2543547 0.7564535
Not at all proud	−0.404256	0.667	33.25	0.2614577	4.01	**0.000**	0.5360701 1.560965
Trust: family members (ref: completely trust)							
Trust somewhat	0.5451465	1.725	−72.49	0.0812119	6.71	**0.000**	0.3859742 0.7043189
Do not trust very much	1.191894	3.293	−229.33	0.1781901	6.69	**0.000**	0.8426474 1.54114
Do not trust at all	1.145384	3.144	−214.36	0.3008084	3.81	**0.000**	0.5558108 1.734958

Note: Bold values represent statistically significant *P*-values.

2005–2009; Ordered logistic regression: number of observations = 2489; LR chi²(44) = 163.14; Prob > chi² = 0.0000; Log likelihood = −3907.6214; pseudo *R*² = 0.0204. 2013–2016; Ordered logistic regression: number of observations = 3033; LR chi²(49) = 529.05; Prob > chi² = 0.0000; Log likelihood = −6044.3725; pseudo *R*² = 0.0419.

Ethnicity

Ethnicity was found to be statistically significant in explaining cheating on taxes, with those of Asian descent having the least odds of reporting cheating on taxes as justifiable. Using the 2005–2009 data, it was found that when the mixed-race and white groups are compared to Asian people, the odds of seeing cheating on taxes as justifiable declines by 48% and 43%, respectively. Comparing the two waves considered in this study, the difference is narrowing, as based on the 2013–2016 data, the odds decrease by only 28%, 37% and 5% for black people, mixed-race people and white people, compared to Asian people.

Employment

Employment brings social and psychological utility beyond the value of income alone, and there is more to working than just income. However, although employment brings much utility, the level of taxation may discount that utility heavily – as a result, one who is not in employment may place a higher premium on the opportunity to work and less of a

premium on the effects of tax, while the one in employment realises the burden of taxation – the view of the two categories when it comes to justification for cheating on taxes may therefore differ. Using full-time employed people as a baseline, being a housewife decreases the odds of cheating on taxes by 36% (based on the 2005–2009 data), and based on the 2013–2016 data, being a retired citizen decreases the odds of cheating on taxes by 0.7%, and being unemployed decreases them by 13%. In addition, entering the working-class category reduces the odds of cheating on taxes by 39% in the 2005–2009 data and by 21% in the 2013–2016 data.

Confidence in the government

These results also prove that there are indeed a range of psychological and behavioural factors that inform tax compliance. For instance, in this regard, people who do not have much confidence in the government might still comply because of the psychological or direct financial cost of noncompliance, because of fear of tax collection officials or because they simply do not believe in any form of cheating the system. Results show that when citizens have no confidence in the government, they will have higher odds of cheating on taxes compared to those who somewhat have confidence in the government, with the odds increasing by 25% for those who have quite a lot of confidence in the government, 80% for those who do not very much trust the government and 103% for those who do not trust the government at all. This means that for one who does not have confidence in the government at all, they are twice as likely to cheat on tax, compared to one who has full confidence in the government. Corruption, for example, as revealed in the State Capture inquiry, irregular or unauthorised and wasteful expenditure by many government departments erodes public confidence in the government, which may reduce tax collection.

Patriotism

Citizens who are less proud of their country (unpatriotic) exhibit higher odds of cheating on taxes. For example, using the 2013–2016 data, being 'quite proud' of one's nationality compared to being 'very proud' increases cheating odds by 10%, whereas being 'not very proud' of one's nationality increases the odds of cheating on taxes by 13%. However, counter-intuitively, the odds of one who is 'not proud at all' of their nationality decrease by 33% compared to the citizens who are 'very proud'. There might be other intermediating effects at play or a reflection of the thresholds for 'hatred' of one's own country.

Social capital

The weaker the social capital (proxied by trust in family members in Table 3), the higher the odds of cheating on taxes, because reciprocity is weak or absent when there is no trust. In the same vein, social preferences – wanting the best for others – are low when trust is low. With the baseline being those who completely trust their family members, for those who are 'somewhat trusting', the odds of cheating increase by 37%, and one who 'does not trust very much' has odds

increasing by 66% compared to one who is very trusting. This corresponds to the confidence in the government and patriotism discussed above.

In addition to the discussed determinants that affect compliance, individuals' behaviour may also change when there is an increase in the rate of tax, especially if the use of the tax is known beforehand (Park & Yoon 2017). Below are responses to tax increases for particular use.

Compliance towards an increase in environmental tax

Another model considered is a response to an increase in specific (environmental or funding foreign aid) tax (a specific policy stance). The response to overall tax compliance may differ if there is more information provided on the type of tax or the use of the generated income. Environmental tax will be believed to be aimed at ensuring the environment is kept in a sound state, presenting an opportunity for sustainability, while foreign aid can be considered to mean being altruistic to other countries' citizens (extended social preference). There are valuations of the environment, which in the case of South Africa may be influenced by a sense of ownership and/or access to the 'environment' (see Table 4).

The environmental tax increase variable was used in a regression model (results are presented in Table 5) to determine what factors explain the level of agreement to an increase in taxes that fund activities that reduce environmental pollution. This is in line with arguments contained in Ali (2017), Park and Yoon (2017) and Bristow et al. (2010), among others.

The variables considered to explain level of agreement with increase in tax to finance environmental protection include age, level of education, income level, ethnic group, employment status, social class and patriotism.

Age, social class and patriotism

Age, social class and patriotism are statistically insignificant, which shows that the behaviour is not different across all categories for these variables.

Education

With regard to education level, results for individuals who have completed secondary school, completed high school, have enrolled in a university preparatory program and

TABLE 4: Level of agreement with the increase in tax to help prevent environmental pollution.

I would agree to an increase in taxes if the extra money is used to prevent environmental pollution	Frequency	%	Cumulative
1. Strongly agree	904	11.16	11.16
2. Agree	2626	32.43	43.59
3. Disagree	2824	34.87	78.46
4. Strongly disagree	1744	21.54	100.00
Total	**8098**	**100.00**	**-**

TABLE 5: Ordered logistic regression – response to tax increase for particular use (environmental pollution) (wave: 2005–2009).

Environment pollution tax	Coefficients	Standard error	z	P > [Z]	95% confidence interval
Age					
25–35	0.1539562	0.1330467	1.16	0.247	−0.1068106 0.4147231
36–45	0.0333656	0.1421856	0.23	0.814	−0.2453131 0.3120442
46–55	−0.0846619	0.1583323	−0.53	0.593	−0. 3949874 0.2256637
56–65	0.0097549	0.1974205	0.05	0.961	−0.3771822 0.3966919
66 and above	−0.0961876	0.2535091	−0.38	0.704	−0.5930563 0.4006812
Education level					
Completed primary school	−0.1263906	0.1915972	−0.66	0.509	−0.5019143 0.2491331
Incomplete secondary school	−0.6091111	0.3763608	−1.62	0.106	−1.346765 0.1285426
Completed secondary school	−0.5918792	0.1938811	−3.05	**0.002**	−0.9718791 −0.2118792
Incomplete secondary – University prep	−0.3369894	0.1504936	−2.24	**0.025**	−0.6319514 −0.0420273
University – preparatory	−0.3641598	0.1635355	−2.23	**0.026**	−0.6846836 −0.043636
Incomplete university	−0.6014906	0.5042433	−1.19	0.233	−1.589789 0.3868081
Degree or higher education	−0.8237776	0.2147924	−3.84	**0.000**	−1.244763 −0.4027921
Income level					
Second step	0.2673324	0.1736399	1.54	0.124	−0.0729956 0.6076603
Third step	−0.0031452	0.1692127	−0.02	0.985	−0.334796 0.3285055
Fourth step	0.2748139	0.1667011	1.65	**0.099**	−0.0519143 0.6015421
Fifth step	0.0147499	0.1602554	0.09	0.927	−0.299345 0.3288447
Sixth step	−0.1496937	0.1691229	−0.89	0.376	−0.4811686 0.1817812
Seventh step	−0.2329024	0.172772	−1.35	0.178	−0.5715294 0.1057245
Eighth step	−0.0941405	0.1880078	−0.50	0.617	−0.462629 0.2743481
Ninth step	−0.5978772	0.3120557	−1.92	**0.055**	−1.209495 0.0137407
Tenth step	−0.8916393	0.2790757	−3.19	**0.001**	−1.438618 −0.3446611
Ethnic group					
Black people – other or black people	−0.3295042	0.2015151	−1.64	0.102	−0.7244666 0.0654582
Mixed–race people (dark)	−0.4681446	0.2229078	−2.10	**0.036**	−0.9050359 −0.0312533
White people or Caucasian people	−0.0528794	0.2107245	−0.25	0.802	−0.4658919 0.3601331
Employment status					
Part-time	−0.1243909	0.1490935	−0.83	0.404	−0.4166088 0.167827
Self-employed	−0.3388157	0.1764959	−1.92	**0.055**	−0.6847413 0.00711
Retired	−0.0074812	2009597	−0.04	0.970	−0.401355 0.3863927
Housewife	0.1722616	0.1815557	0.95	0.343	−0.1835812 0.5281043
Students	−0.2120765	0.1702568	−1.25	0.213	−0.5457737 0.1216206
Unemployed	−0.1405241	0.1164519	−1.21	0.228	−0.3687657 0.0877174
Other	14.42991	850.2843	0.02	0.986	−1652.097 1680.957
Social class					
Upper middle class	−0.0906746	0.2349338	−0.39	0.700	−0.5511364 0.3697872
Lower middle class	−0.3349902	0.2442546	−1.37	0.170	−0.8137203 0.14374
Working class	−0.229017	0.2448047	−0.94	0.350	−0.7088254 0.2507914
Lower class	0.106348	0.252809	0.42	0.674	−0.3891485 0.6018446
Confidence in the government					
Quite a lot	0.2225118	0.0969891	2.29	**0.022**	0.0324166 0.4126069
Not very much	0.5922905	0.116912	5.07	**0.000**	0.3631471 0.8214338
None at all	0.7085155	0.164167	4.32	**0.000**	0.3867542 1.030277
Proud of nationality					
Quite proud	0.0910151	0.0971588	0.94	0.349	−0.0994126 0.2814428
Not very proud	0.119643	0.2310041	0.52	0.605	−0.3331167 0.5724027
Not at all proud	−0.404256	0.6455153	−0.63	0.531	−1.669443 0.8609306

Note: Bold values represent statistically significant P-values.
Ordered logistic regression; number of observations = 2349; LR chi²(41) = 143.69 | Prob > chi² = 0.0000; Log likelihood = −2984.9065; pseudo R^2 = 0.0235.

have completed a university degree are all statistically significant, showing that these categories would agree to an increase in taxes if the funds were to be used to prevent environmental pollution, compared to those who did not complete their primary education. This implies that education enlightens one about the need for environmental protection, as the more educated one gets, the less one disagrees with additional tax to finance environmental protection.

Income

Results support the long-held belief that concern for environmental quality is limited to wealthy nations (in the case of wealthy individuals). Dunlap and York (2008) assert that both academics and policymakers assume that residents of poor nations are too preoccupied with satisfying their 'material' needs to support the 'postmaterialist' value of environmental protection. The authors compared the WVS data to previously conducted surveys and concluded that

citizens' concern for the environment is not dependent on national affluence, nor on affluence-based postmaterialist value. This has been contradicted at the individual country level, specifically in the case of an emerging economy, South Africa. The authors found that concern for the environment is dependent upon individual affluence (which will culminate to national) and thus postmaterialistic values. The higher the level of income, the less one is inclined to disagree to tax increases to protect the environment. When taking a closer look at the categories of wealth (income) in Table 5, at lower income levels, the concern is the same across income groups; it only becomes pronounced (statistically significantly different) at the top income categories.

Ethnicity

The black and white ethnic groups are statistically not different from the Asian ethnic group, while the mixed-race group is statistically significant. When compared to Asian people, the mixed-race group is less likely to avoid (disagree with) paying the environmental pollution protection.

Employment

Those who are self-employed seem to care more about the environment than the formally employed ones. This may be attributable to the majority of self-employment activities that are dependent on the environment, at least in developing and emerging economies like South Africa. The International Labour Organization (ILO) (2018) note that environmental degradation destroys work opportunities, and in developing communities, significant work opportunities are in the self-employment category. Being employed reduces the odds of disagreeing to a tax increase for environmental protection by about 29%. The results show that the self-employed are less likely to disagree with paying taxes to protect the environment.

Confidence in the government

As confidence in the government decreases, the odds of disagreeing to paying extra tax to protect the environment increases. This means that when one does not have confidence in the leadership of the country, one is not willing to pay for the care of the environment – it all boils down to not trusting how the funds will be utilised. Public accountability is critical for boosting confidence; therefore, cooperation and compliance will be easy to obtain for sustainable development.

The factors explaining willingness to fund foreign aid will be further investigated (Table 6). Results are presented in Table 7, showing that higher levels of education increase the odds of supporting higher taxes to finance foreign aid.

The unemployed disagree with paying more tax to finance financial aid. If one has no access to economic opportunities, imagining that money can be collected to support other countries defies logic, hence the level of disagreement.

As the confidence in the government deteriorates, one is less willing to contribute higher taxes to finance financial aid; the

odds decrease by 27% for those who have quite some confidence in the government, 60% for those who have not very much confidence and 60% for those who have no confidence at all. On the other hand, a drop in patriotism (proud of nationality) reduces the odds of wanting to pay higher taxes for foreign aid financing by 29%. Although foreign aid can boost the pride and image of one's country, it may be worth it if the country is developing and faced with many other ills, as is the case of South Africa (high unemployment, poverty and inequality).

Key findings

The study was set to investigate the determinants of tax compliance and responses to tax increases. The key findings in the study have shown that the perceptions, attitudes and behaviours of South African citizens have generally shifted from a society that values tax compliance to a nation that justifies cheating on taxes. According to these results, the main behavioural factors that shape perception and behaviour towards tax compliance and tax evasion were found to be, among others: demographic factors such as age, level of education, employment status, social class, income level and ethnic group. In addition to the discussed demographic factors, social capital (confidence in the government, patriotism and whether one trusts one's family members) was also significant. Generally, people who have little confidence in the government would be expected to be more likely to justify cheating on the government. This conclusion proves that there are more psychological and behavioural aspects that shape people's decisions, such as the fear of being caught for noncompliance. Citizens would rather choose to overlook a corrupt government and continue to pay taxes because of behavioural factors. Finally, trust as a social capital factor gave evidence of how an individual's childhood, religion and other influences they get from their homes can inform their decision-making regarding tax compliance and tax evasion.

Conclusion and policy implications

Based on the results obtained from the analysis, the study concludes that demographic and social capital factors largely shape South Africans' perceptions and behavioural responses towards tax compliance. Compliance has been tested from the angle of willingness to cheat, agreeableness to higher taxes to protect the environment and willingness to pay higher taxes, to actions that government takes that might have a direct impact on how individuals respond to tax policy. The analysis of this study reveals that individuals' perceptions and behavioural responses towards tax compliance are gradually leaning in the direction that will incite further unwillingness to pay tax and the consequent

TABLE 6: Willingness to fund foreign aid.

Be willing to pay higher taxes in order to increase country's foreign aid	Frequency	%	Cumulative
No	1625	66.25	66.25
Yes	828	33.75	100.00
Total	**2453**	**100.00**	-

TABLE 7: Ordered logistic regression: Response to a tax increase for a particular use (foreign aid) (wave 2005–2009).

Foreign aid tax	Coefficients	Standard error	z	P > |z|	95% of confidence interval
Age					
25–35	0.0152975	0.1670502	0.09	0.927	−0.3121149 0.34271
36–45	0.0207914	0.1804621	0.12	0.908	−0.3329078 0.3744906
46–55	0.2958901	0.2011027	1.47	0.141	−0.098264 0.6900442
56–65	−0.2585273	0.2591515	−1.00	0.318	−0.766455 0.2494003
66 and above	−0.1145689	0.3334032	−0.34	0.731	−0.7680271 0.5388892
Level of education					
Completed primary education	−0.1835437	0.261621	−0.70	0.483	−0.6963114 0.3292239
Incomplete secondary school	0.9893891	0.4837976	2.05	**0.041**	0.0411631 1.937615
Completed secondary school	0.5632851	0.2518676	2.24	**0.025**	0.0696336 1.056937
University – preparatory	0.296971	0.1992947	1.49	0.136	−0.0936394 0.6875815
Completed university – preparatory	0.4738807	0.215946	2.19	**0.028**	0.0506343 0.8971272
Incomplete university	0.6134639	0.6105861	1.00	0.315	−0.5832629 1.810191
Degree or higher education	0.7195105	0.2714654	2.65	**0.008**	0.187448 1.251573
Income level					
Second step	0.1302694	0.2291264	0.57	0.570	−0.3188101 0.5793489
Third step	0.1477267	0.2225539	0.66	0.507	−0.288471 0.5839243
Fourth step	0.2264456	0.2172093	1.04	0.297	−0.1992768 0.6521679
Fifth step	0.0884865	0.2114318	0.42	0.676	−0.3259122 0.5028852
Sixth step	0.2114167	0.2203934	0.96	0.337	−0.2205464 0.6433798
Seventh step	−0.0129068	0.2286894	−0.06	0.955	−0.4611297 0.4353162
Eighth step	−0.0336078	0.2450171	−0.14	0.891	−0.5138325 0.4466169
Ninth step	0.1965613	0.3731788	0.53	0.598	−0.5348557 0.9279783
Tenth step	0.5340653	0.3387515	1.58	0.115	−0.1298755 1.198006
Ethnic group					
Black people – other or black people	0.2966923	0.2745279	1.08	0.280	−0.2413725 0.8347572
Mixed–race people (dark)	0.1718777	0.2988839	0.58	0.565	−0.4139239 0.7576794
White people or Caucasian people	−0.0909846	0.2885057	−0.32	0.752	−0.6564454 0.4744762
Employment status					
Part-time	−0.1648264	0.1861155	−0.89	0.376	−0.529606 0.1999532
Self-employed	0.2373834	0.2172738	1.09	0.275	−0.1884653 0.6632322
Retired	−0.1862002	0.2640643	−0.71	0.481	−0.7037568 0.3313564
Housewife	−0.3374996	0.2354787	−1.43	0.152	−0.7990293 0.1240301
Students	0.1308897	0.2116511	0.62	0.536	−0.2839388 0.5457182
Unemployed	−0.2828366	0.1478533	−1.91	**0.056**	−0.5726238 0.0069506
Other	12.61209	424.9757	0.03	0.976	−820.325 845.5492
Social class					
Upper middle class	0.2259223	0.2907082	0.78	0.437	−0.3438553 0.7956999
Lower middle class	0.3790822	0.3008799	1.26	0.208	−0.2106315 0.968796
Working class	0.1920015	0.3029361	0.63	0.526	−0.4017424 0.7857454
Lower class	0.0458305	0.3129881	0.15	0.884	−0.5676148 0.6592759
Confidence in the government					
Quite a lot	−0.3207116	0.1173491	−2.73	**0.006**	−0.5507116 −0.0907116
Not very much	−0.9056823	0.1488024	−6.09	**0.000**	−1.19733 −0.614035
None at all	−0.9182751	0.2133262	−4.30	**0.000**	−1.336387 −0.5001634
Proud of your nationality					
Quite proud	−0.336456	0.1325042	−2.54	**0.011**	−0.5961594 −0.0767525
Not very proud	−0.3085903	0.3034154	−1.02	0.309	−0.9032737 0.286093
Not at all proud	−0.2309391	0.826323	−0.28	0.780	−1.850502 1.388624

Note: Bold values represents coefficients that are statistically significant.
Ordered logistic regression; number of observations = 2128; LR chi²(41) = 151.13 | Prob > chi² = 0.0000; Log likelihood = −1289.5368; pseudo R^2 = 0.0554.

low tax revenue collection. It is strongly suggested that for South Africa's fiscal consolidation framework to become effective in its goal of reducing deficits and other measures of increasing revenue, cognitive and behavioural factors that shape citizens' choices to either comply or evade tax need to be considered.

In doing so, the framework will be well fitted into South Africa's unique socio-economic landscape, instead of applying a one-size-fits-all approach. The study has shown that less educated people and young people are more likely to disagree with tax compliance. The revenue service (SARS), in partnership with government departments such as the Department of Education, can make it their mandate to educate those still in school and the community at large, from townships to rural areas, about the importance of tax compliance. Individuals behave according to the confidence level that they have in the

government; as a consequence, citizens closely relate their behaviours with their perceived fairness and reciprocity from the government. The South African government is therefore advised to manage fiscal policy in a manner that will increase citizens' confidence to potentially increase the willingness to comply. In future, for further research, the study of behavioural response to tax compliance can be extended by including behavioural methods aimed at shaping taxpayers' compliance decisions. To effectively determine causations, methods such as natural experiment by Pomeranz (2015) and Pomeranz and Vila-Belda (2019) and conducting randomised control trials must be considered for further research (Ebrahim et. al 2019).

Acknowledgements

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