An analysis of taxpayer compliance using a cost-benefit approach

SAW SOR TIN [a,b,*]

[a] *School of Graduate Studies, Asia e University, Malaysia*

[b] *Royal Customs Department, Putrajaya, Malaysia*

ARTICLE INFO	ABSTRACT
	This study seeks to analyze and enhance understanding of taxpayer compliance with tax obligations in a systematic way by using the cost-benefit approach. Data from a sample of 250 audited service tax payers are used to examine the compliance factors. The hypotheses are tested using Spearman's rho for ordinal variables and biserial correlation for dichotomous data. A decision matrix is used to make a logical conclusion on the business firm reporting behavior based on the derived expected utility value and compliance level. The results show a positive significant correlation between taxable sales, return submission and taxpayer compliance, but taxpayer compliance has a negative relationship with deficiency amount, penalty, and three other variables. The study suggests that minor penalties are unlikely to deter non-compliant behavior and economic factors seem to exert more influence on compliance. The methodology and matrix diagram can be customized to the requirements of tax audit management for assisting in audit case selection and strategy program to detect under-declaration and minimize shortfall in tax revenue. The taxpayer compliance-Correlation-Expected utility matrix analyzes the taxpayer's expected utility function and compliance behavior, and provides an insight to what the most likely decision of a taxpayer is under certain assumptions.

[*] Corresponding author.
[a] Email: serene.saw@gmail.com/saw.st@customs.gov.my (Saw Sor Tin).

1. Introduction

1.1. Theoretical development

Becker (1968) developed an economic framework for analyzing illegal behavior in the late 20th century and introduced the cost-benefit analysis of public enforcement policy to deal with crime. He argued that human behavior can be seen as rational and maximizing utility. Hence, from the government's perspective, the costs of law enforcement are weighed against the benefits of crime deterrence; the utility is derived from justice criteria rather than welfare.

Following this model, Allingham and Sandmo (1972) established the basic economic tax compliance model in which financial incentives are determined by audit, penalty, and tax rates based on the assumption that taxpayers are utility maximizers, are rational, and have knowledge of penalty and detection risk. Thereafter, the economic deterrent theory is founded upon the paradigm that considered taxpayers as economic rational or profit seekers who are motivated by opportunities and benefits. As a consequence, the taxpayer will evade tax if benefits exceed the expected cost of being caught. Indeed, the theory emphasized the use of economic and legal deterrence (penalty, interest rate, threat, coercion, punishment), and this has contributed to a positive impact on deterrence of tax evasion.

In the present century, Sizoo (2010) argued that in an age enamored of machines, life becomes amoral, without moral bearings, devoid of moral categories. This infers that the neoclassical paradigm on human behavior has re-emerged and become an issue of primary concern, thereby signifying the relevance of the economic deterrence theory and expected utility theory to underpin this study.

An effective approach toward ensuring higher tax compliance rate and tax revenue is by enhancing understanding of how taxpayers make decision under uncertainty and premises of expected utility theory. The expected utility model in the mathematical form was explained by Bernoulli (1954) and developed to become the St. Petersburg paradox relating to probability and decision making (under risk) theory in economics.

Bernoulli (1954) suggested "The utility resulting from any small increase in wealth will be inversely proportionate to the quantity of goods previously possessed. This implies diminishing marginal utility (i.e. equal increments of wealth add to utility at a decreasing rate) and hence people would maximize moral expectation (or the utility of wealth) rather than expected monetary value".

Henceforth, a theory of decision under risk (or uncertainty) was established, known as the expected utility (EU) theory. The EU theory defines how individuals make decision or choose alternatives in complex situations based on their basic needs, choice, or preferences concerning risk and the intrinsic value of each attribute such as trust, ethics, reputation, or

other inherent qualities of individuals, firms, institutions, or organizations under consideration.

1.2. Research problem statements

According to Aronson et al. (2010), compliance is a complicated concept that must be studied in depth so that its uses, implications, and both its theoretical and practical approaches may be understood.

In Malaysia, service tax is an important source of revenue for the government. It is imposed on the cost of services or goods provided by a taxable person at the rate of 6%. Unchecked noncompliance with tax laws and regulations and under-declaration of service tax may worsen the tax gap. The service tax gap can be defined as the difference between the actual amount of tax due and the amount that is declared and paid with returns submission. Using 2012 tax revenues, the IMF predicts a goods and services tax gap of 2.7–3.0 per cent of GDP for Malaysia (IMF, 2014). The Malaysian sales and service tax system is characterized by a self-reporting system whereby service tax collected by the taxable person (business or professionals) is declared and paid to the government in the bimonthly return. However, the correct declaration and payment of tax collected depends largely on the business firm's compliance decision and behavior. Amoral taxpayers may choose to evade taxes whenever the opportunities arise either due to low risk of detection, high costs of compliance, or low ethical values. For this group of taxpayers, enforcement through audits and higher fines may deter noncompliance. On the contrary, the taxable business firms may comply because of a sense of duty, moral obligation, or other motivations; such taxpayers can be encouraged to consistently comply by cooperative measures. In practice, such a tax enforcement system can improve or keep compliance level unchanged without increasing social costs (Raskolnikov, 2009).

The basic idea and purpose of this research is to establish a conceptual framework that can close a theoretical gap in understanding taxpayer compliance (TC), and to develop an appropriate matrix of decision-making under risk in order to explore and explain individual or business firms' reporting behavior with a focus on service tax. Data drawn from past tax audit cases are used to identify the determinants of service tax compliance (STC).

Since the late 18th century, the economic deterrence model had been used to examine tax compliance (or noncompliance) from a theoretical perspective. Jackson and Milliron (JM) (1986) examined 14 key determinants of tax evasion which are divided into three groups: demographic, economic (income level, income source, marginal tax rates, sanctions, probability of detection), and behavioral (complexity, fairness, revenue authority initiated contact, compliant peers, ethics or tax morale). Eventually, JM's work asserted that there is no absolute consensus on any of these factors, given that a significant relationship exists with taxpayer compliance. Hence, in view of the nature and uniqueness of tax audit data, the proposed model is constructed with seven key determinants of STC which are divided into two groups: economic and legal factors.

First and foremost, this study aims to analyze the taxpayer compliance with tax obligations in a systematic way by using the EU (cost-benefit) concept. It suggests a new approach for examining taxpayer compliance (TC) through a matrix of taxpayer compliance level, correlation strength, and expected level of utility (TCE). The TCE matrix provides an insight to what the most likely decision of a taxpayer is under a fixed set of rules, assumptions, and conditions. The empirical findings can then assist tax administrations, particularly in the selection of cases for audits, albeit improving audit performance, revenue collection, and tax compliance in general.

1.3. Conceptual framework and research hypotheses

Despite various expansions to the two fundamental tax compliance models, i.e. Allingham and Sandmo (1972) and Jackson and Milliron (1986), there are limited studies that focus empirically on identifying service tax audit variables and their correlations with taxpayer compliance. It is thus worthwhile to examine STC with different proxies for the economic and legal (based on Service Tax Act and Regulations, 1975) variables of taxpayer compliance. The JM model of tax compliance is thus modified to analyze the variables of STC as shown in Figure 1. It comprises the economic variables (i.e. deficiency claim, audit outcome, taxable sales, return submission[1]), the legal variables (i.e. penalty on return, number of offences, nature of offence), and a dependent variable—Taxpayer Compliance. In accordance with Alm's (1999) view, such a proposed model could provide a framework for understanding the influence of the economic and legal variables with the expected utility function over taxpayer compliance decision and (reporting) behaviour.
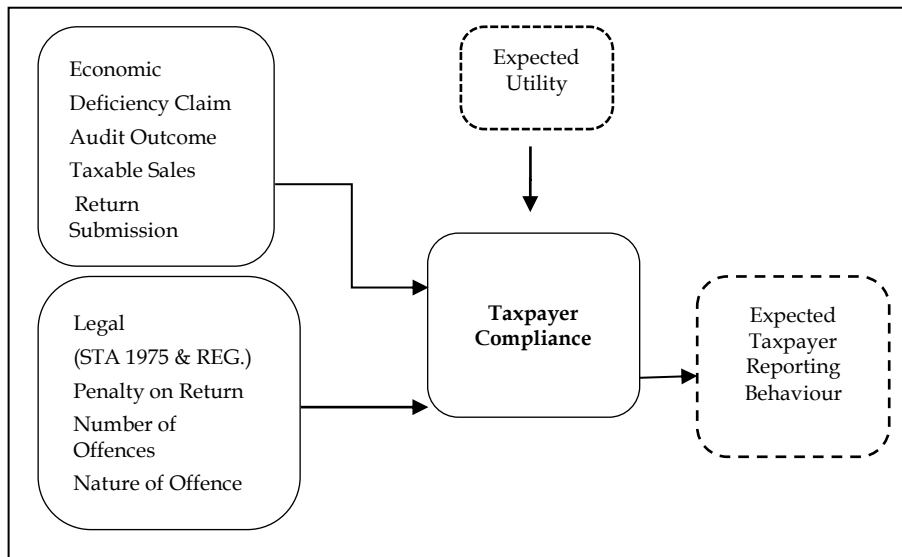

Figure 1. Modified James and Milliron (1986) tax compliance model

---

[1] Service tax payment made in form CJP1 within 28 days after the end of the specified taxable period and submitted to respective Station.

In the context of this study, taxpayer compliance refers to an act, specifically a submission of tax returns with the correct declaration and payment of the taxes owed, within the stipulated period, and to the tax authority. The main driving force behind compliance is believed to be economic and socio-psychological influence which can affect (reporting) behavior and may extend beyond it. In addition, tax compliance costs refer to the total costs incurred by taxpayers for complying with tax laws and regulations. Nonetheless, tax compliance costs should be kept relatively low as compared to administrative costs (i.e. incurred by taxpayers). Moreover, business firms may think of taxation as a transfer of resources from the private sector to the government, and may expect their loss of resources as equal to the amount of tax, plus costs incurred from customer tax collection point to paying tax via returns including any changes in individual (e.g., spending) behavior or business decision-making (e.g., production).

1.3.1 Research hypotheses.

Abiding by the simple rule that a hypothesis should only suggest one relationship in order to determine the actual source of any observed effect, this study proposes the following hypotheses:

H_1: *There is a correlation between deficiency claim and TC.*

H_2: *There is a correlation between audit outcome and TC.*

H_3: *There is a correlation between taxable sales and TC.*

H_4: *There is a correlation between return submission and TC.*

H_5: *There is a correlation between penalty on return and TC.*

H_6: *There is a correlation between number of offences and TC.*

H_7: *There is a correlation between nature of offence and TC.*

2. Literature review

2.1. Expected utility theory

From the early 1950s to 1979[2], the Expected Utility Theory (EUT) dominated economic analysis of decision-making under risk.

According to Hershey and Schoemaker (1980), the Expected Utility Theory directs which alternative decision to select in complicated situations depending on one's basic experience and preferences about risk-taking and the intrinsic value of the attribute(s), and these

---

[2] In 1979, the Prospect Theory was created by Kahneman & Tversky as an alternative theory of decision under uncertainty. It has become the most accepted alternative to expected utility theory.

elements are captured through a utility function; thus, maximizing expected utility is a rational behavior.

Takemura (2014) elaborates the structure of decision-making under risk as:

When a set of finite alternatives is A where the elements are organized as mutually exclusive alternatives $a_1,....a_i,.....a_l$ (l is the number of alternatives), the set can be written as A = { $a_1,... a_i,.....a_l$ }. Subsequently, we consider the set, $X = \{x_1,...x_j,.....x_m\}$, which is the result of adopting these alternatives. For instance, the element of X includes x_1 = a gain of \$100, x_2 = no gains, and x_3 = a gain of \$200. When a specific alternative a_i is adopted, a result x_j is likely to appear. However, a_i and x_j are not mutually correspondent. The result x_j of adopting alternative a_i should depend at least on a state of some kind, $\theta = \{\theta_1,...\theta_k,.... \theta_n)$, and the probability distribution of θ in decision making under risk is known.

The expected utility theory thus suggests that decisions be made by computing the probability, expected utility and choosing the best alternatives based on available information of varying types and quality and one's own risk assessment or judgment. In the above scenario, an audited taxpayer may decide to comply or not based on the following information: (i) prior audit experience; (ii) known or unknown probability of audit or detection; (iii) future calculated gain or loss from tax compliance, evasion or tax avoidance; (iv) imposed tax rates, penalties and sanctions; (v) moral obligations or ethics; (vi) binding laws and regulations; and/ or (vii) social norms or peer response behavior.

Additionally, Kleven et al. (2011), in an experimental setting, observed that savvy taxpayers receiving 50% or 100% probability audit threat letters would react strongly when the threat is explicitly made on a small scale but not on a broad scale, due to their perception that tax authority may not have enough resources to expand to the entire population.

In this study the expected utility is derived based on the taxpayer's cost-benefit analysis and the correlation results of the seven independent variables. Each of the variable's correlation relationship strength with TC is used to estimate the level of EU, i.e. expected benefit gained minus cost incurred due to tax compliance and risk of audit in the future. A review of recent compliance studies using expected utility to analyze tax compliance behavior[3] is as follows.

2.1.1 Expected utility of taxpayer and tax inspector

In the tax-audit game model presented by Bag and Wang (2018), it is assumed all taxpayers are risk neutral, an honest taxpayer will always report the true profit, whereas a strategic taxpayer will evade if the (net) expected benefit of evasion is positive, and there is no moral or cost of auditing problem. The taxpayer's expected utility for reporting is expressed separately when common shock is 0, 1, or 2, and tax inspector's expected (net) profit from auditing a particular taxpayer reporting is expressed in both a good and bad

---

[3] Two types of noncompliance are: (i) tax avoidance, a practice of using legal methods to pay minimal tax and avoid paying the real amount of tax; and (ii) tax evasion, a practice of using illegal means to avoid paying actual tax.

state (report zero profit) of economy. Assuming there is at most one-step underreporting, the tax inspector tend to audit low returns more intensively than medium returns when common shock is favorable; and sometimes do not audit at all when common shock is unfavorable.

2.1.2 Expected utility of crime

Supposing an offender may find himself saying, "I received a lower tax bill than I feared, but it was high enough to make me lose my job, now, with my bad record, I'm having difficulties finding any work at all" (Crump, 2018).

In such a scenario, Crump (2018) explained that: "Besides the effect of criminal sentences, the criminal justice system can cause deterrence from indirect and extra-legal reactions. These kinds of extrinsic effects (for instance, reputation loss, shame, and embarrassment) might be serious enough in some cases to decrease the expected utility of crime".

2.1.3 Expected utility of commission (socially undesirable act)

Gordon (1989) found that if tax evaders feel guilty of evasion, their utility decreases by the disutility of guilt. Socially undesirable acts (such as tax evasion) are often regulated by monetary fines, because norms are often considered as not sufficient to control socially undesirable acts (McAdams & Rasmusen, 2007).

Lee's (2017) study found that: "If an individual who commits the act is detected with probability $p \in (0,1)$, and in that event the individual is fined m, then an increase in p decrease the expected utility gain from the commission (of the act) and hence it increases the critical benefit. As society becomes more affluent, monetary fines are more likely to increase the number of those who commit an offence rather than norms, and fines are more likely to make higher-income taxpayers better off than norms. Fines are regressive, as they are generally fixed and do not depend on offenders' incomes, and norms becomes the better system of deterring socially undesirable act".

2.2. Tax audit economic and legal variables

The tax compliance literature indicates that among other factors, economic and legal variables play an important role in the compliance behavior of taxpayers. The following comprises a review of related studies which analyze variables that are similar to the economic and legal proxies selected for this study.

2.2.1 Tax audit deficiency claim

Hanlon et al. (2005) used past Internal Revenue Service (IRS) operational audits, appeal, and tax return data for corporations to calculate the tax deficiencies (noncompliance) of large corporations as assessed by IRS auditors for the 1983–1998 period, and it amounted to about 13% of true tax liability. They found that the largest companies (with more than $5 billion assets) have 74% of tax deficiency. Indeed, some studies have reported that the noncompliance rate for corporations is U-shaped, with medium-sized businesses or large companies having the lowest noncompliance rate. Besides, they also found a positive

relationship between private companies intangible assets (as proxied by research and development expenses and market-to-book ratio) and its tax deficiency rate, which demonstrated tax planning practice as well.

Li et al. (2018) used corporate tax data (China) to examine the impact of tax audits on tax avoidance. They noted that after an audit, firms significantly increase their compliance on effective rates, book-tax differences, and discretionary accruals.

2.2.2 Tax audit outcome

Audits are generally viewed, with literature support, as being an effective tool for deterring tax evasion (Alm & McKee, 2006). However, Devos (2002) found no significant change in compliance for those audited over a twenty-year period, even though penalties increase significantly during that time. Kastlunger et al. (2009) conducted a study through experimental research and suggested that early audits have a positive impact on compliance.

Oh and Lim (2011) explained that if the taxpayers are re-audited in the future, whatever additional tax and penalties imposed during the previous audit would be the taxpayer's future expected costs[4]. Therefore, the taxpayers who were audited before will know what the future expected costs are likely to be and may choose not to evade tax if they perceive the stakes are high. Dubin (2012) found that the direct effect of doubling the audit rate produce an increase in assessed or total collections.

In an experimental study by Hsu (2013), it was found that on average, subjects are willing to spend 20% to 30% of their tax revenue on auditing. Compliance is also improved if subjects can determine the budget and the probability of audit. These findings indicated that tax auditors incentives to detect evasion are to be taken into account in the design of compliance-improvement audit programs.

Phillips (2014) examined the response of taxpayers to targeted audit (i.e. based on audit selection and payment rates). The results predicted by a deterrence model showed much less evasion. This indicated that regardless of whether evasion has a high or low return, a taxpayer's knowledge of his preferred outcome is an important factor in determining payment rates or amount of evasion.

Kogler et al. (2016) found that delayed feedback on tax audits results in higher compliance than immediate feedback. This supports the assumption that decisions based on rare experience or events probabilities are underweighted.

2.2.3 Annual taxable sales (or income)

Stefura (2012) examined the relationship between specific factors and the compliance intention of individual taxpayers in Romania based on survey questionnaires data. The results confirmed that the taxpayers with past untraceable income are less compliant, and

---

[4] Jackson and Jones (1985) in the Journal of American Taxation Association indicated that if expected cost of tax non-compliance is known to taxpayers, then, it is a factor that may change taxpayers' non-compliance decision-making.

that the compliance intention increases as the perceived chance of being audited and detected increases. In addition, it was indicated that when the perceived actual income tax level is high or too high, the taxpayers would become less compliant, and taxpayers in their 50's and older are more compliant than the younger ones.

Using data mainly from individual tax returns of The IRS's National Research Program from the audit of 1,101 cases with only sole proprietor income, McKerchar et al. (2013) tested six indicators of tax morale. They also tested the impact of the demographic and tax filing control variables on reporting compliance, suggesting that '*age'*, income per capita, is positive and statistically significant (at the 5% level), whereas 'taxable income' is negative and contributes only modestly to reporting compliance.

Al-Mamun et al. (2014) explored the impact of demographic factors on tax compliance attitude and behavior of 92 respondents in Johor Bahru. The results showed that Malaysian taxpayers are moderately tax-compliant, and that gender, age, qualification/education, income, and working experience are significantly correlated with tax compliance, but age and income are negatively correlated. Furthermore, the result showed that ignorance of tax law is an important concern for the Government.

In the study conducted by Che Rosli et al. (2018) on high net-worth individuals who were audited by the IRBM from 2009 to 2013, it was reported that there is no significant relationship between level of income and tax rate with tax malfeasance, or rather the source of income and taxation performed by tax professionals are significant.

2.2.4 *Tax return submission*

Most empirical studies supported the hypothesis that increasing audit probability will lead to an increase in compliance behavior such as the submission of a true and correct return (Pommerehne & Wech-Hannemann, 1996). Some *s*tudies have shown that certain groups tend to under-declare their revenue (e.g., do not comply with Section 30 of the Service Tax Act 1975[5]) while others tend to over-claim deductions (e.g., contra system).

Meiselman (2018) carried out a controlled field experiment by mailing different messages to 7,142 suspected non-filers. Compared to basic mailing (only request a return), it showed that non-filing of tax return improves with messages on statutory penalty, compliance cost (with blank tax return), and punishment probability (with recipient's federal income). Besides, the number of back-year returns filed per response increases from 8% to 27%, and the filed returns (with tax due) increase from 39% to 52%. Moreover, older, higher income, and first-time non-filers are more responsive to file returns.

2.2.5 *Penalty on (late) return*

Bag and Wang (2018) analyzed a model of tax-audit game on what probability the tax authority might audit the returns of the self-employed individuals/business owners. With

---

[5] Service Tax Act 1975 (ACT 151) and Regulations and Order, Laws of Malaysia (2013), International Law Book Services, Kuala Lumpur.

three possible profit realizations (high, medium, and low), a range of equilibrium reporting and auditing predictions are obtained under progressive taxation. The results demonstrated that when penalty is high, only high-profit business owners evade, while for moderate penalties, medium-profit business owners evade more often.

Hokamp and Diaz (2018) used agent-based tax evasion model to study tax declaration behavior due to expected utility maximization, and it was established that penalty negatively affects the extent of tax evasion.

2.2.6 Number of offences

There is a general lack of research on number (or types) of offences as a variable affecting taxpayers' compliance behavior. This may be partly due to the use of general offences in such research.

Behavioral science research has shown that complexity impacts individuals's decision making and may encourage dishonesty. Thomas (2017) argued that taxpayer services should be as quick and easy as possible to encourage better compliance and fewer offences, for instance, creating a more user-friendly tax system to ease burden of taxpaying and reduce tax compliance costs.

Ganga et al. (2017) conducted an experiment to investigate people's perception and decisions to evade or pay taxes, and cooperation in social system such as tax honesty in modern era by manipulating coercive and legitimate authority[6]. The findings revealed that under coercive authority, tax payments are lower and decisions are faster; participants show more rational reasoning, enforced compliance, and voluntary cooperation than under legitimate authority. It may be that in a condition of legitimate authority, decision conflict, cognitive demands in tax decisions, and noncompliance are higher compared to coercive authority.

Wirth et al. (2018) probed for means to reduce behavioral effects of cognitive conflict and demonstrated that it is possible for the rule-breaker to overcome the costs of rule violations when having violated this particular rule frequently and very recently.

2.2.7 Nature of offence

Kim (2013) examined the optimal law enforcement when the apprehension probability depends on the actual offence rate (i.e. realized by its own nature) as well as budget policy. Hence, if people believe that lowering the fine will lead to a lower offence rate, then an individual will be less inclined to commit an offence due to expectation of a higher apprehension/arrest probability. In this case, the maximal fine will not be socially optimal.

Devos (2013) analyzed the role of penalties and sanctions in containing non-compliance behavior or tax fraud, and suggested that penalties and sanctions can only be an effective deterrent if the offenders perceive a chance of being caught and prosecuted. This could mean that compliance will increase as long as the costs of offending does not outweigh the

---

[6] Legitimate authority refers to using a soft approach to improve taxpayer's compliance behavior, i.e. based on acceptance, appreciation, perceived expertise, and information services.

benefits, and increasing the level of sentences may not sufficiently deter individuals to commit an offence. Moreover, there is significant evidence of a high level of recidivism for tax crime; hence, punishment does not really deter non-compliant behavior. Research from the US, the UK, and Australia has found that out of 60 per cent of those given a community-based sentence, 70 per cent will reoffend within two years (Marriott, 2012).

Basri and Dwimulyani (2018) conducted a survey on 219 managers, and the results of SEM analysis showed that the indirect influence of perception of tax sanctions on taxpayer compliance through an intervening variable, i.e. self-assessment system practice, can be proven.

3. Methodology

A service tax deficiency is defined as the difference between the amount of service tax declared on a tax return by a taxpayer and the actual amount as assessed by RMC accounts inspection officer during an audit. The actual amount is derived by summing total declared tax and deficiency amount (i.e. shortfall in revenue). The amount of declared tax is then divided by the actual amount to compute taxpayer compliance which has a value of between 0 and 1. Zero denotes 0% (nil) compliance, and 1 denotes 100% (full) compliance. Hypotheses about the causal relations existing between the seven variables and TC are tested and validated. A summary of the correlation results (effect size of rho (ρ) or r_{bis}) of the economic and legal variables is given separately in a table format. Finally, the TCE matrix is presented to explain the expected reporting behavior of business firms retroactively.

3.1. Method of statistical analysis

Statistical data analysis using IBM Statistical Package for the Social Science (SPSS) software is conducted to check for correlation between the tax audit variables and taxpayer compliance. SPSS Spearman's rho (ρ) correlation nonparametric test and biserial correlation (r_{bis}) parametric test are performed to identify the strength of relationships or associations between pairs of variables, where the respective correlation coefficient rho (ρ) or r_{bis} varies between -1 and +1. Zero denotes absence of correlation and ±1 denotes perfect correlation.

3.2. Level of measurement

The sample of the study is made up of 60% non-compliant cases and 40% compliant ones. Where applicable, data on an interval or ratio scale are grouped onto an ordinal scale and coded accordingly. There are six ordered categorical variables used in this study: four of them have 7 category levels and two variables have 6 category levels. Number of offences is continuous variable with 5 values or 5 category levels. However, audit outcome is a dichotomous variable with 2 levels. The details and method/basis of ranking data of all the variables are as described in Table 1.

Table 1.

Level of measurement and category

	Type Variable	Category Level	Rating Scale	Method or Basis of Ranking Data for Data Sample Size = 250
1	Tax D.Claim Amount (RM)	7 leve1s	1-7	Based on the actual deficiency claim value as finalised in the respective audit cases.
2	Audit Outcome (dichotomous)	2 levels	0-1	Independent Variable; measured as zero (0) value for no deficiency claims case and value of one (1) for with claim case.
3	Annual Taxable Sales (2012) (RM)	7 levels	1-7	Based on total sales amount for year 2012 which corresponds to the amount of service tax paid for taxable year of 2012.
4	Tax Return Submission	7 levels	0-6	Based on a 3 years tax period (18 tax periods) for year 2010 to 2012.
5	Penalty on Return	6 levels	0-5	Based on the penalty imposed at time of late submission of returns for a period of 3years from 2010 - 2012.
6	Number of Offences *	5 levels	0-4	Refers to the number of offences detected in an audit.
7	Nature of Offence	6 levels	0-5	Refers to the major offence (seriousness nature) detected in an audit.
8	Taxpayer Compliance Level	7 levels	0-6	Dependent Variable; measured as the amount of service tax declared by taxpayer divided by the amount of actual service tax as calculated by the auditor.

Note: * Offence Types:

    Part III refers to Section 7 and 8 of the Service Tax Act, 1975

    Part IV refers to Section 10, 11 and 12 of the Service Tax Act, 1975

    Part V refers to Section 14(1) and 14(2) of the Service Tax Act, 1975

    Part VI refers to Section 29 of the Service Tax Act, 1975

Categorizing of Continuous Variables: Ordinary level of measurement uses symbols to classify observations into different categories that have some explicit relationships among them: four observations are classified into categories of greater and lesser in this study. There are four plus one continuous variables that have been divided into practically accepted categories of 7 or 6 levels respectively, to overcome the following data analysis issues: (i) high variability that causes the continuous data not to yield significant outcomes;

and (ii) outliers (un-omitted realistic cases) for a continuous function that gives a poorer and less accurate result. The rating scale of these variables is as described in Appendix II.

3.3. Spearman-rho (ρ) and Biserial correlation analysis

The data for both non-compliant (n=150) and compliant groups (n=100) are used to investigate the correlation or relationship between the audit variable(s) and taxpayer compliance level. Analysis of the sample includes three legal variables and four economic variables. For testing hypotheses, Spearman-rho (ρ) nonparametric correlation is chosen over Pearson's bivariate (parametric) correlation because: (i) it does not require interval or ratio scale (continuous) data; (ii) it uses ranks instead of assumptions about the distributions of the two variables; (iii) it does not require assumptions of linearity, normality of variables, and homoscedascity; (iv) it only requires monotonic symmetric relationship between two ranked variables; and (v) it allows analysis of associations between variables of ordinal level measurement.

In addition, biserial correlation parametric test is performed because the variable audit outcome is dichotomous (with only two levels); therefore, the continuous-level ratio scale data for the dependent variable (TC) is used in this test.

3.4. Cost-benefit analysis through taxpayer compliance-correlation-expected utility matrix

The TCE matrix analysis can provide a clear understanding of why and how the taxpayers are likely to make future compliance decision by undertaking the following sequence of analytical steps. Firstly, group together all the variables of the same coefficient sign and the same range of effect size. Secondly, match the variables and put them in their respective effect size group in the matrix as illustrated in Table 5. Thirdly, using the correlation strength of each variable, establish a scenario in which compliance would be high to be used as a baseline for measuring EU and TC in other scenarios. Fourthly, apply the deductive method to determine the EU value and taxpayer compliance level accordingly for each type of scenarios. Fourthly, use a general interpretation rule to predict taxpayer reporting behavior (e.g., when EU is low, TC is high, reporting behavior will be good). Lastly, draw inferences from the results of the prediction analysis to highlight priority cases for audits.

4. Data analysis and results

4.1. Research sample and design

There are a total of 19,564 service tax payers registered in Federal Territory of Kuala Lumpur (FTKL) in 2012, which account for 46% of the total numbers of service tax license

holders[7] in Malaysia. Moreover, nearly 80% of the service tax audit cases are resolved in FTKL. Based on the statistics above, the research sample comprises 250 FTKL service tax payers who were audited in 2012. The sample was selected from a population of 330 service tax audit cases whereby some non-conforming cases were dropped to avoid common statistical problems. By applying data exploration, some outliers are removed from analysis, and type I and II errors can be avoided, among other problems, thus reducing the probability of getting inaccurate results and drawing wrong conclusions.

This quantitative research is conducted using questionnaire, audit cases, and supporting database for statistical analysis. A questionnaire is required to capture compatible data set for analysis, and it is divided into two sections:

A. Information on Service Tax license holder

B. Details on accounts inspection/audit on Service Tax license holder

4.2. The Spearman-rho (ρ) correlation analysis and results

The Spearman-rho (ρ) nonparametric correlation is suitable for analyzing variables, i.e. measured on an ordinal scale. The Spearman-rho (ρ) test is carried out to measure the degree of association between six ordinal/rank and one dichotomous variables and a dependent variable—taxpayer compliance level (TC). The Spearman's rank-order correlation test results of the six audit variables and TC are shown in Table 2. By eyeball search, there is no correlation coefficients with value greater than 0.9, thus indicating no multicollinearity issue in the data or no variables that are highly correlated.

Table 2.

Results of Spearman's rho (ρ) Correlation – Nonparametric Test (n=250)

Variables	Tax Deficiency Claim	Tax Audit Outcome	Annual Tax Sales	Tax Return Submission	Penalty on Return	Number of Offence	Nature of Offence	Taxpayer Compliance Level
Def. Claim Amount	1.000	0.696***	0.038	–0.450***	0.301***	0.384***	0.336***	–0.699***
Tax Audit Outcome	0.696***	1.000	–0.216***	–0.567***	0.290***	0.468***	0.281***	–0.840***
Annual Taxable Sales	0.038	–0.216***	1.000	0.483***	–0.109**	–0.280***	–0.093	0.370***
Tax Return Submission	–0.450***	–0.567***	0.483***	1.000	–0.233***	–0.402***	–0.275***	0.811***
Penalty on Return	0.301***	0.290***	–0.109**	–0.233***	1.000	0.502***	0.470***	–0.299***
Number of Offences	0.384***	0.468***	–0.280***	–0.402***	0.502***	1.000	0.516***	–0.485***
Nature of Offence	0.336***	0.281***	–0.093	–0.275***	0.470***	0.516***	1.000	–0.317***

---

[7] There are a total of 40,111 and 42,188 service tax licence holders who are registered with the Royal Malaysian Customs Department in 2011 & 2012 respectively. Source: *Royal Malaysian Customs Department Annual Report 2011 & 2012.*

Variables	Tax Deficiency Claim	Tax Audit Outcome	Annual Tax Sales	Tax Return Submission	Penalty on Return	Number of Offence	Nature of Offence	Taxpayer Compliance Level
Taxpayer Compliance Level	–0.699***	–0.840***	0.370***	0.811***	–0.299***	–0.485***	–0.317***	1.000

Note: *** and ** denote significant level at 1% and 5% respectively.

4.3. The Biserial correlation analysis and results

The Biserial correlation (rbis) is suitable for analyzing dichotomous variable with an independent continuous (ratio) variable. The biserial rbis parametric test is then carried out to measure the degree of association between audit outcome and taxpayer compliance. The result of the biserial test is rbis = –0.650; df = 248, p < 0.01; the effect size of rbis is thus lower than Spearman's rho (ρ) test result where ρ = –0.840; df = 248, p < 0.01. Since the biserial correlation is a parametric test and the assumptions (e.g., linearity and normality of variable) are stronger, the rbis result is chosen for hypothesis testing of audit outcome.

4.4. Research hypotheses and results

Based on the SPSS Spearman–rho (ρ) and biserial correlation rbis analysis, the results and explanation on the research hypotheses are as follows.

H_1: There is a correlation between deficiency claim and TC.

The result shows that there is a significant and large[8] negative correlation between deficiency claim and taxpayer compliance level (ρ = –0.699; df = 248, p < 0.01). This implies that there is a large tendency for a deficiency claim to increase when the taxpayer compliance level is decreasing. Hence, it may be generally laid down that as the deficiency claim becomes lower, the taxpayer compliance level becomes higher.

H_2: There is a correlation between audit outcome and TC.

The result shows that there is a significant and large negative correlation between audit outcome and TC (r_{bis} = –0.650; df = 248, p < 0.01). This implies that there is a large tendency for an audit outcome to be positive when the taxpayer compliance level is decreasing. Hence, it may be generally laid down that when the audit outcome is positive, the taxpayer compliance is low.

H_3: There is a correlation between taxable sales and TC.

The result indicates that there is a significant and moderate positive correlation between taxable sales and taxpayer compliance level (ρ = 0.370; df = 248, p < 0.01). The finding suggests that there is a moderate tendency for the taxpayer compliance level to increase with a corresponding increase in annual taxable sales. In other words, there is a moderate

---

[8] Refer to Appendix I: Guidelines for interpreting effect size of correlation coefficients by Hopkins (1997) for interpretation of all values obtained from testing research hypothesis.

tendency for taxpayers with a higher taxable sales level to be more compliant than taxpayers with a lower taxable sales level. Nevertheless, it is not an easy task for auditors to detect any tax avoidance practices of large companies with higher sales revenue, timely tax returns filing, and good payment records.

H_4: There is a correlation between return submission and TC.

The result shows that there is a significant and very large positive correlation between return submission and TC (ρ = 0.811; df = 248, p < 0.01). This implies that there is a high tendency for the return submission to be more up–to–date, when the taxpayer compliance rate is higher. This means that compliance level can be improved through enforcement of timely filing or submission of tax returns.

H_5: There is a correlation between penalty on return and TC.

The result shows that there is a significant and low negative correlation between penalty on return and level of TC (ρ = –0.299; df = 248, p< 0.01). This implies that there is a small tendency for the penalty (on return) level to increase when the compliance rate decreases, and conversely, for the penalty level to decrease when the level of compliance increases. This could mean that minor penalties may not deter the delinquent taxpayer from filing a late return. For instance, if the declared taxable sales are RM500, then the maximum penalty would be only RM250 (0.5*500), which may not be high enough to deter non–filing or late filing of returns.

H_6: There is a correlation between number of offences and TC.

The result shows that there is a significant and moderate negative correlation between number of offences and taxpayer compliance level (ρ = –0.485; df = 248, p < 0.01). The finding suggests that there is a moderate tendency for the taxpayer compliance level to increase with a corresponding decrease in number of offences detected. In the same way, it follows that there is a moderate tendency for taxpayers with a lower number of tax offences to be more compliant than taxpayers with a higher number of tax offences.

H_7: There is a correlation between nature of offence and TC.

The result shows that there is a significant and moderate negative correlation between nature of offence and taxpayer compliance level (ρ = –0.317; df = 248, p < 0.01). The finding suggests that there is a moderate tendency for the compliance level to increase with a corresponding decrease in the serious nature of offence committed by the taxpayer. In the same way, it follows that there is a moderate tendency for taxpayers with a less serious nature of offence to be more compliant than taxpayers with a more serious tax offence.

To sum up, the findings on the taxpayer compliance (TC) level is as follows:

- TC is very largely influenced by the variable return submission and positively;
- TC is largely influenced by the variables deficiency claim & audit outcome and negatively;
- TC is moderately influenced by the variables taxable sales, positively; and number of offences and nature of offences, negatively;

- TC is slightly (to a small degree) influenced by the variable penalty on return and negatively.

In conclusion, the above findings show that the maximum amount of penalty may not deter some errant taxpayers for late or non-filing of a tax return. However, a single late return submission or offence may be more serious than three late return submissions or offences committed by a taxpayer depending on the taxable sales amount. As such, the amount of penalty and deficiency claim may act together to produce interaction effect. Therefore, by multiplying the two predictor variables together, a researcher could obtain a more accurate finding on the deterrent effect of penalty.

4.5. Summary of Spearman-rho (ρ) and Biserial test results

A summary of the Spearman-rho (ρ) correlation test results and coefficient strength using Hopkins (1997) guideline for *n=250* is presented in Table 3. It also includes a summary of the Pearson correlation test results and coefficient strength for *n=150* for comparison of results between the two sample sizes.

Table 3.

Summary of the Spearman-rho (ρ) and biserial correlation test results

Item	Variables	Sig. (2-tailed)	Hypothesis Testing: *n=250***	Hypothesis Testing: *n=150****
1.	*Deficiency Claim*	*<0.01*	–0.699 Large	–0.376 Moderate
2.	*Audit Outcome**	*<0.01*	–0.650 Large	
3.	*Taxable Sales*	*<0.01*	0.370 Moderate	0.354 Moderate
4.	*Return Submission*	*<0.01*	0.811 Very Large	0.664 Large
5.	*Penalty on Return*	*<0.01*	–0.299 Small	Not significant
6.	*Number of Offences*	*<0.01*	–0.485 Moderate	Not significant
7.	*Nature of Offence*	*<0.01*	–0.317 Moderate	–0.305 Moderate

Note: *Biserial correlation test result

**The sample comprises 150 noncompliant cases and 100 compliant cases. Level of measurement is ordinal

***The sample comprises 150 noncompliant cases only. Level of measurement is interval or ratio scale

Based on the above results and observations, further explanation on the correlation strength in relation to the type of data used can be provided as follows:

By using ordinal data and a larger sample size (*n=250*), the correlation strength of deficiency claim and return submission is large and very large respectively, but for a smaller sample size (*n=150)* with continuous variables, the correlation strength *r* is moderate and large respectively. As for taxable sales level and nature of offence, the correlation strength is moderate (i.e. the same) for both sample sizes.

By using continuous variables and a smaller sample (*n=150*), the correlation strength of variable is commonly accepted as more accurate and not inflated. However, this common belief may not be completely true, if the range of dataset is very large such as from RM100 to RM10 millions, and treatment for outliers is necessary.

By using continuous (log-transformed) data (*n=150*), the normality of variables is improved (skewness is removed), leading to a better outcome or result on the relationship between tax deficiency claim level and taxable sales level and TC.

4.6. Spearman-rho (ρ) and biserial correlation results with supporting literature

Referring to the summary of correlation test results for the seven (7) independent variables in Table 3, a summary of the interpretation of the Spearman-rho (ρ) and biserial correlation results with its corresponding hypotheses (H_1 to H_7) is given in Table 4, with the respective supporting or relevant literature from Section 2.

Table 4.

Summary of results from correlation tests and relevant literature

H_1	There is a significant and large negative correlation between deficiency claim and TC.
	Support H_1: Largest companies had 74% tax deficiencies (Hanlon et al., 2005).
H_2	There is a significant and large negative correlation between audit outcome and TC.
	Support H_2: Knowledge of outcome determine amount of evasion (Phillips, 2014).
H_3	There is a significant and moderate positive correlation between taxable sales and TC.
	Support H_3: Higher income non-filers were more responsive or compliant (Meiselman, 2018).
	Do not support H_3: High and medium-profit earners tend to report less tax (Bag & Wang, 2018) Higher income tax payer are more likely to commit an offence (Lee, 2017). Taxable income is negative and moderate to reporting compliance (McKerchar et al., 2013). No significant relationship between level of income with tax malfeasance (Che Rosli et al., 2018).
H_4	There is a significant and very large positive correlation between return submission and TC.
	Support H_4: Non-filing of tax return and filed returns (with tax due) improved with mailing messages on statutory penalty, compliance cost and sanction (Meiselman, 2018).
H_5	There is a significant small negative correlation between penalty on return and TC.
	Support H_5: Increase penalty leads to no significant change in compliance level (Devos, 2002). Higher fines (*i.e.* less effective than norms) do not increase much compliance or decrease the number of offenders in affluent society (Lee, 2017).
	Do not support H_5: Lower fines lead to lower offence rate (Kim, 2013). Increased penalty leads to decrease in evasion (Hokamp & Diaz, 2018). High-moderate penalties lead to business evasion (with high-medium profit) (Bag & Wang, 2018).
H_6	There is a significant moderate negative correlation between number of offences and TC.
	Support H_6: Frequent and recent offences lead to lower cost of rule violations or lower compliance (Wirth et al., 2018).

H[7]   There is a significant moderate negative correlation between nature of offence and TC.

Support H[7]: Penalties and sanctions can only be effective if the offenders perceived being caught and successfully prosecuted (Devos, 2013). Perception of tax sanction affects TC (Basri & Dwimulyani, 2018).

5. Summary and conclusions

5.1. Explaining taxpayer compliance through the Expected Utility Theory

The Expected Utility Theory (EUT) is used to explain the influence of audit variables and taxpayer compliance. In this study, expected utility is defined as a utility function applied to uncertain outcomes, individual or business choices plus a decision rule based on benefit–cost analysis of compliance. For instance, a taxpayer encounters a pair of uncertain audit outcomes, 1 or 2, with expected probabilities *p* and *1–p*: he can first multiply each option's utility (*U*) by its probability, and then choose the outcome which maximizes utility (yields highest expected benefit) or maximizes moral expectation. Here is the expected utility calculation:

$$EU = (p)U(1) + (1-p)U(2)$$

5.2. Explaining EUT using correlation test result for ordinal / dichotomous DV

The Spearman–rho (ρ) and biserial correlation results, using ordinal or dichotomous scale data respectively, show that there is a significant positive correlation between taxable sales (0.370), return submission (0.811), and TC as well as a significant negative correlation between tax deficiency claim (–0.699), audit outcome (–0.650), penalty on return (–0.299), number of offences (–0.485), nature of offence (–0.317) and taxpayer compliance. Therefore, the negative correlations with their corresponding effect size could indicate that taxpayer compliance level is high when: (i) the deficiency claim amount, audit outcome is low; (ii) penalty on return is high; and (iii) number of offences or nature of offence is moderate. On the other hand, the positive correlations with their corresponding effect size could indicate that taxpayer compliance level is high when return submission is high and taxable sales is moderate.

A taxpayer will perform a cost-benefit analysis and will comply when benefit exceeds the cost of compliance. This paper attempts to explain the possible future decision of an audited taxpayer to comply and pay all taxes due by using the following scenarios (Table 5).

5.2.1 Scenario A

Assuming all other parameters are kept constant (*ceteris paribus*) if the taxpayer expects: (i) a low deficiency claim amount, low audit outcome, and a high penalty on return; and/or (ii) a moderate taxable sales with high return submission during the next audit; then he will comply (TC is high) as the expected utility is low due to a low benefit value and low cost of

compliance. This case scenario will be used as baseline for measuring EU and TC in Scenarios B and C.

5.2.2 *Scenario B*

Conversely, assuming all other parameters are kept constant (*ceteris paribus*), if the taxpayer expects: (i) a high deficiency claim amount and audit outcome; and/or (ii) a low taxable sales with low return submission during the next audit, but probability of detection and penalty is low, then the compliance rate will drop (TC is low) as the expected utility is higher (compared with Scenario A) due to a higher benefit value and relatively lower cost of compliance.

5.2.3 *Scenario C*

In addition, assuming all other parameters are kept constant (*ceteris paribus*), if the taxpayer expects: (i) a low deficiency claim amount and audit outcome; and/or (ii) a high taxable sales with high return submission, but probability of detection and penalty is high, then the taxpayer compliance will improve (TC is good) as the expected utility is lower (compared with Scenario B) due to a lower EU benefit and relatively lower cost of compliance.

Therefore, by using the Spearman's correlation coefficient rho (ρ), biserial r_{bis} results and the EU theory; the TCE matrix is established: (i) to explain the predicted taxpayer compliance level; (ii) to show how the expected utility value is determined by rational or deductive method from results of correlation, i.e. the effect size of a single or set of variable; and (iii) to illustrate the cost-benefit analysis with *ceteris paribus* assumptions.

Table 5.

The TCE (TC, Correlation Strength and Expected Utility) Matrix Diagram

Case	TC	Correlation – Effect Size			Expected Utility	*Cost–benefit Analysis ** Condition	Correlation – Effect Size	
		Low	Moderate	High			High	Moderate
A	High	TDClaim TOutcome	OffType NatOff	Penalty	Low	*Low EU = LowBenefit –LowCost	TRetSubm	TSales
B	Low	TRetSubm TSales			Higher than A	*Higher EU= High Benefit –Low Cost		
B	Low				Higher than A	**Probability of Detection & Penalty are Low	TDClaim TOutcome	OffType NumOff
C	Good	TDClaim TOutcome	OffType NatOff		Lower than B	*Lower EU = LowBenefit –LowCost		
C	Good				Lower than B	**Probability of Detection & Penalty are High	TRetSubm TSales	

Note: 1. TDClaim: Tax Deficiency Claim 4. TretSubm: Tax Return Submission 7. NatOff: Nature of Offence

2. Toutcome: Tax Audit Outcome 5. Penalty: Penalty on Return

3. Tsales: Taxable Sales (Annual) 6. NumOff: Number of Offences

On the practical side, this TCE or decision matrix can allow an audit team to analyze taxpayer compliance and recommend the best solution to improve audit performance and detect tax evasion or tax avoidance.

5.2.4 Penalty and offences

In the above explanation, the influence of the legal variables has not been much discussed because the SPSS results show that: (i) taxpayer compliance is minimally influenced by penalty on return; and (ii) number of offences or nature of offence has moderately low influence on TC. The findings are in consistent with that of : (i) Park and Hyun (2003), who reported a weaker influence of fines on compliance level; (ii) Devos (2004), who found that the taxpayer noncompliance is not directly affected by taxation penalties alone; (iii) Noor et al. (2013), who revealed that penalty has an extremely small significant effect on service tax evasion; (iv) Hartl et al., (2015), who observed that the amount of fine does not impact tax payment; (v) Marriott (2013), who found that minor penalties in New Zealand are unlikely to deter non-compliant behavior; and lastly (vi) Devos (2013), who concluded that compliance will increase if the costs of offending is greater than the benefits.

5.3. TCE matrix and conceptual framework

This research identifies the factors influencing taxpayer's decision to comply and pay actual taxes, which are deficiency claim, audit outcome, taxable sales, return submission, penalty on return, and number of offences and nature of offence. These seven variables are related to different aspects of the RMC audit. The variable(s) correlation strength is used to obtain the taxpayer's expected utility value (low or high) and TC level (low, good, or high), thereby allowing the prediction of future taxpayer compliance decision and reporting behavior. In fact, it follows logically from the TCE analysis in the matrix diagram that: (a) when taxpayer compliance is high, reporting behavior will be very good; (b) when taxpayer compliance is low, reporting behavior will be bad; and (c) when taxpayer compliance is good, reporting behavior will be good.

The conceptual framework, a modified new version of the Jackson and Milliron (1986) tax compliance model, as depicted in Figure 1, has been verified through: (i) statistical tests using SPSS, i.e. the result of the Spearman-rho (ρ) and biserial rbis correlation tests; (ii) the results of the TCE matrix analysis; and (iii) the prediction of taxpayer reporting behavior based on logical reasoning or a general interpretation rule.

5.4. Discussion

Noncompliance due to tax avoidance is a relatively new phenomenon in developing Asian countries, and the need to curb this problem is becoming inevitable in a growing economy. It may reduce actual tax compliance, tax revenues, and economic growth, and affect the capability of the government to provide economic development as well as social and welfare facilities for the citizens.

Tax avoidance is the practice of not paying or paying the least taxes by not reporting the true and correct taxable sales in the tax returns through legal means such as: (i) changing one's business structure via incorporation; (ii) establishing a new company to run the business when the threshold amount of services is reached; (iii) transferring cost between departments; and (iv) trading of supplies or labor between departments of a larger multi-entity company with separately-run individual entities. Tax avoidance is certainly within the letter of the law but not the spirit of the law. According to an experimental study by Dezoort et al. (2018), accountants regard tax avoidance from transferring prior operating losses to lower effective tax rate of corporations as highly ethical but not the general public, and that perceived ethicality is influenced by perceived fairness and legality. Chen and Lin (2017) investigated corporate tax avoidance, suggesting that firms avoid tax more aggressively with less analyst coverage.

Enforcing a higher level of compliance through tax audit in developing countries is a daunting task for the Revenue department. During an audit, the business which owes taxes and penalties would be given an official written claim on the proposed deficiency, which is normally agreed by the taxpayer after one or several round table discussions. A brief account on the tax deficiency or shortfall in revenue which has been recovered by tax authorities worldwide through verification audits is as follows.

In July 2015, United Nation (UN) initiated a project with the Organisation for Economic Cooperation and Development (OECD) to assist developing countries to strengthen their tax audit capabilities. According to the UN, Columbia's revenue collection increased from $3.3 million in 2011 to $33.2 million in 2014 due to tax audit advice and guidance from UN and tax audit experts. However, efforts to raise additional revenue to reduce tax gaps and promote education and health care developments are often constrained by tax evasion, tax avoidance, and illicit financial flows (Ugwumadu, 2015). On the other hand, IRS collected US$54.2 billion in revenue from audits and related enforcement efforts for the year 2015 as compared to US$57 billion in 2014 (Saunders & Rubin, 2016).

The total value of verification audits carried out in 15 OECD countries on Large Tax Units (LTU's) is estimated at US$45 billion; whereas the total number of tax dispute is estimated at US$12.96 million (about 0.0288%). In Europe, the total value of verification audits was US$30 billion and tax dispute amounted to US$12.6 million (about 0.042%). In North America (Canada, United States) the value of verification audits was US$13 billion with 343,000 tax dispute cases, whereas in Asia, the value was US$1 billion with 19,000 tax dispute cases (OECD, 2009).

In order to overcome such issues, the Audit Department has to adopt a firm and reliable approach by making audit and selection strategy more efficient and effective (e.g., through risk-based audit tools, improved profiling and targeting) to improve tax revenue collection and compliance level as well.

Although enforcement through audits is known to be an effective tool for deterring tax evasion or avoidance, a natural extension to enforcement (through using cooperation

approach) would be to improve tax authority's services and encourage voluntary compliance through persuasive methods rather than punitive methods (Devos, 2013). This single policy approach is supported by Murphy (2003), who found that procedural fairness issues and cordial treatment by the tax authorities were important in dealing with tax scheme evaders or avoiders (Devos, 2013).

5.5. Suggestions for improving compliance

Based on the findings and discussions in this paper, a few suggestions are given on ways and means to improve compliance. The Spearman-rho (ρ) and biserial correlational analysis are used to identify the factors influencing TC. In brief, it is found that there is a low-to-moderate effect size of legal factor (i.e. penalty on return, number of offences, and nature of offences) on taxpayer compliance, and that there is a moderate, large, or very large effect size of economic factor (i.e. annual taxable sales, deficiency claim amount, tax return submission, and tax audit outcome). The results provide evidence on the best approach to encourage and improve compliance, with support of existing empirical studies, in two ways.

Firstly, the results do not give support to the use of punitive approach to encourage compliance. In fact, the punitive approach to offenders may have minimal influence on taxpayer compliance. On the contrary, using cooperation/persuasion approach may have better influence on taxpayer compliance by means of encouraging: (i) true declaration of taxable sales; (ii) regular and timely submission of tax returns; and (iii) a good tax audit record. In fact, the signing of an MOU (memorandum of understanding) between the tax payer and authority can offer a win-win situation with mutual economic benefits for both parties. Moreover, both Barbuta-Misu (2011) and Palil et al. (2013) have found that the most important determinants of tax compliance are economic factors. Above all, there is probably a need to have a well-balanced punitive and cooperative measure or policy to achieve the optimum level of taxpayer compliance after an audit. In this respect, studies have shown that there is an overall positive direct effect of tax audits (Tagkalakis, 2004; Niu, 2011; Saw, 2017).

Furthermore, some studies have revealed that the presence of good management support or commitment from revenue agencies (such as Customs) and better cooperation from taxpayers had a positive relationship with both the compliance and revenue indicators. Last but not least, any creative problem-solving strategies to increase compliance should also improve the taxpayer's perception on the integrity of tax systems and structure as a whole.

The author also wishes to thank the staff of the University of Malaya Library for their kind cooperation■

References

Allingham, M. G., & Sandmo, A. (1972). Income tax evasion: A theoretical analysis. *Journal of Public Economics*, *1*(3-4), 323–338.

Alm, J. (1999). Tax compliance and administration. *Public Administration and Public Policy*, *72*, 741–768.

Alm, J., & McKee, M. (2006). Audit certainty, audit productivity, and taxpayer compliance. *National Tax Journal*, *59*(4), 801–817.

Al-Mamun, A., Entebang, H., Mansor, S. A., Yasser, Q. R., Nathan, T. M., & Rahman, M. (2014). The impact of demographic factors on tax compliance attitude and behavior in Malaysia. *Journal of Finance, Accounting & Management*, *5*(1), 109–124.

Aronson, E., Wilson, T.D. and Akert, R.M. (2010). *Social Psychology* (7th ed.). Upper Saddle River, NJ : Prentice Hall

Bag, P., & Wang, P. (2018). Tax evasion and inspection under idiosyncratic and common shocks. *SMOE Working Paper.*

Basri, S. Y. Z., & Dwimulyani, S. (2018). Factors affecting individual taxpayer compliance with practice self assessment system as intervening variable. *Journal of Entrepreneurship, Business and Economics*, *6*(1), 116–143.

Barbuta-Misu, N. (2011). A review of factors for tax compliance. *Economics and Applied Informatics*, 1, 69–76.

Becker, G. S. (1968). Crime and punishment: An economic approach. *Journal of Political Economy, 76*(2), 169–217.

Bernoulli, D. (1954). Exposition of a new theory on the measurement of risk. *Econometrica, 22*(1), 23–36.

Che Rosli, R., Ming Ling, L., & Embi, R. (2017). Tax malfeasance of high net-worth individuals in Malaysia: Tax audited cases. *Journal of Financial Crime, 25*(1), 155-169

Chen, T., & Lin, C. (2017). Does information asymmetry affect corporate tax aggressiveness?. *Journal of Financial and Quantitative Analysis*, *52*(5), 2053–2081.

Crump, D. (2018). Deterrence. *St. Mary's Law Journal*, *49*(2), 317–362.

Devos, K. (2002). Penalties and sanctions for Australian taxation crimes and the implications for taxpayer compliance. *Australian Tax Forum, 17*(30), 257–286.

Devos, K. N. H. (2004). Penalties and sanctions for taxation offences in Anglo-Saxon countries: Implications for tax payer compliance and tax policy. *Revenue Law Journal*, *14*(1), 32–101.

Devos, K. (2013). The role of sanctions and other factors in tackling international tax fraud. *Common Law World Review*, *42*(1), 1–22.

Dubin, J. A. (2012). *The Causes and Consequences of Income Tax Non-Compliance*. Springer: New York, NY

DeZoort, F. T., Pollard, T. J., & Schnee, E. J. (2017). A study of perceived ethicality of low corporate effective tax rates. *Accounting Horizons*, *32*(1), 87–104.

Gangl, K., Pfabigan, D. M., Lamm, C., Kirchler, E., & Hofmann, E. (2017). Coercive and legitimate authority impact tax honesty: evidence from behavioral and ERP experiments. *Social Cognitive and Affective Neuroscience*, *12*(7), 1108–1117.

Gordon, J.P.P. (1989). Individual morality and reputation costs as deterrents to tax evasion. *European Economic Review*, *33*(4), 797–805.

Hanlon, M., Mills, L., & Slemrod, J. (2005). An empirical examination of corporate tax noncompliance. *Ross School of Business Paper No. 1025*. Available at SSRN: https://ssrn.com/abstract=891226

Hartl, B., Hofmann, E., Gangl, K., Tiefenthaler, M.H., & Kirchler, E. (2015). Does the sole description of a tax authority affect tax evasion? - The impact of described coercive and legitimate power. *PLOS ONE 10*(4): e0123355.

Hershey, J. C., & Schoemaker, P. J. (1980). Risk taking and problem context in the domain of losses: An expected utility analysis. *Journal of Risk and Insurance, 47*(1), 111–132.

Hokamp, S., & Díaz, A.M.C. (2018). Agent-Based Simulations of Tax Evasion: Dynamics by Lapse of Time, Social Norms, Age Heterogeneity, Subjective Audit Probability, Public Goods Provision, and Pareto-Optimality. In *Agent‑based Modeling of Tax Evasion: Theoretical Aspects and Computational Simulations* (pp. 255–288). Hoboken, NJ : John Wiley & Sons Ltd.

Hsu, L. C. (2013). Tax auditing as a public good game: an experimental study on punishment and compliance. *Pacific Economic Review, 18*(4), 475–501.

IMF. (2014). Malaysia Selected Issues. *IMF Country Report No. 14/82*. Retrieved from https://www.imf.org/en/Publications/CR/Issues/2016/12/31/Malaysia-Selected-Issues-41429

Jackson, B.R., & Jones, S.M. (1985). Salience of tax evasion penalties versus detection risk. *The Journal of the American Taxation Association*, *6*(2), 7–17.

Jackson, B. R., & Milliron, V. C. (1986). Tax compliance research: Findings, problems, and prospects. *Journal of Accounting Literature*, *5*(1), 125–165.

Kastlunger, B., Kirchler, E., Mittone, L., & Pitters, J. (2009). Sequences of audits, tax compliance, and taxpaying strategies. *Journal of Economic Psychology*, *30*(3), 405–418.

Kim, J. Y. (2013). A note on the non-maximality of the optimal fines when the apprehension probability depends on the offense rate. *European Journal of Law and Economics*, *36*(1), 131–138.

Kogler, C., Mittone, L., & Kirchler, E. (2016). Delayed feedback on tax audits affects compliance and fairness perceptions. *Journal of Economic Behavior & Organization*, *124*(C), 81–87.

Kleven, H. J., Knudsen, M. B., Kreiner, C. T., Pedersen, S., & Saez, E. (2011). Unwilling or unable to cheat? Evidence from a tax audit experiment in Denmark. *Econometrica*, *79*(3), 651–692.

Lee, K. (2017). Norms and monetary fines as deterrents, and distributive effects. *Journal of Economics*, *121*(1), 1–27.

Li, W., Pittman, J., & Wang, Z.-T. (2018). The determinants and consequences of tax audits: Some evidence from China. *The Journal of the American Taxation Association In-Press*. Retrieved from http://www.aaajournals.org/doi/abs/10.2308/atax-52136

McKerchar, M., Bloomquist, K., & Pope, J. (2013). Indicators of tax morale: An exploratory study. *eJournal of Tax Research*, *11(1)*, 5–22

Meiselman, B. S. (2018). Ghostbusting in Detroit: Evidence on nonfilers from a controlled field experiment. *Journal of Public Economics, 158*, 180–193

Marriott, L. (2013). Does tax crime pay-a trans-tasman comparison of penalties for serious tax offences. *Australian Tax Forum, 28*(4), 875–903.

Marriott, L. (2012). Tax Crime and Punishment in New Zealand. *British Tax Review, 5*, 623–656.

McAdams, R. H., & Rasmusen, E. B. (2007). Norms and the law. *Handbook of Law and Economics*, *2*, 1573–1618.

Noor, R. M., Jamaludin, N. E., Omar, N., & Aziz, R. A. (2013, May). Measuring tax gap in the service industry. In Md. M. H. Bhuiyan (Eds.), *Proceedings of 3rd Global Accounting, Finance and Economics Conference.* Rydges Melbourne, Melbourne, Australia: World Business Institute Australia.

Murphy, K. (2003). A study into tax scheme investors. In *Centre for Tax System Integrity Conference, Australian National University, Canberra* (Vol. 337).

Niu, Y. (2011). Tax audit impact on voluntary compliance. *Journal of Economic and Social Measurement*, *36*(4), 237–251.

OECD (2009). *Tax Administration in OECD and Selected Non-OECD Countries: Comparative Information Series (2008)*. OECD Publishing, Paris. Retrieved from https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/comparative/CIS-2008.pdf

Hai, O. T., & See, L. M. (2011). Intention of tax non-compliance-examine the gaps. *International Journal of Business and Social Science*, *2*(7), 79–83.

Palil, M. R., Hamid, M. A., & Hanafiah, M. H. (2013). Taxpayers compliance behaviour: Economic factors approach. *Jurnal Pengurusan (UKM Journal of Management), 38*, 77–85.

Park, C.G., & Hyun, J.K. (2003). Examining the determinants of tax compliance by experimental data: A case of Korea. *Journal of Policy Modeling*, *25*(8), 673–684.

Phillips, M. D. (2014). Deterrence vs. gamesmanship: Taxpayer response to targeted audits and endogenous penalties. *Journal of Economic Behavior & Organization*, *100*(C), 81–98.

Pommerehne, W. W., & Weck-Hannemann, H. (1996). Tax rates, tax administration and income tax evasion in Switzerland. *Public Choice*, *88*(1–2), 161–170.

Raskolnikov, A. (2009). Revealing choices: Using taxpayer choice to target tax enforcement. *Columbia Law Review, 109*(4), 689–754.

Saunders, L., & Rubin, R. (2016). IRS is focusing on people making more than $1 million. *Wall Street Journal*. Retrieved from https://www.marketwatch.com/story/irs-focuses-its-audits-more-on-1-million-incomes-2016-02-22

Saw, S.T. (2017). A Case study on the effects of tax audit in Malaysia. *Journal of Economics and Policy*, *2*(1), 41–64.

Sizoo, E. (2010). *Responsibility and cultures of the world: Dialogue around a collective challenge*. Bruxelles: P.I.E. Peter Lang.

Slemrod, J. (2007). Cheating ourselves: The economics of tax evasion. *Journal of Economic Perspectives*, *21*(1), 25–48.

Stefura, G. (2012). The role played by economic and noneconomic variables in the analysis of tax compliance. *Review of Economic and Business Studies, 4*(2), 105–120.

Tagkalakis, A. O. (2014). The direct and indirect effects of audits on the tax revenue in Greece. *Economics Bulletin*, *34*(2), 984‒1001.

Takemura, K. (2014). Behavioral decision theories that explain decision-making processes. In *Behavioral Decision Theory* (pp. 143-164). Japan: Springer.

Thomas, K. D. (2017). User-Friendly taxpaying. *Indiana Law Journal, 92*(4), 1509‒1558

Ugwumadu, J. (2015). UN and OECD team up to help developing nations with tax audit. *Public Finance International Organization*. Retrieved from https://www.publicfinanceinternational.org/news/2015/07/un-and-oecd-team-help-developing-nations-tax-audit

Wirth, R., Foerster, A., Herbort, O., Kunde, W., & Pfister, R. (2018). This is how to be a rule breaker. *Advances in Cognitive Psychology*, *14*(1), 21‒37.

Appendix I.

Guidelines for Interpreting Effect Size of Correlation Coefficients

Source	Value	Interpretation
Hopkins (1997)	0.00 to 0.10	Trivial, very small, insubstantial, tiny, practically zero
	0.10 to 0.30	Small, low, minor
	0.30 to 0.50	Moderate, medium
	0.50 to 0.70	Large, high, major
	0.70 to 0.90	Very large, very high, huge
	0.90 to 1.00	Nearly, practically, or almost: perfect, distinct, infinite

Note: The scales of magnitude are extracted from statistical power analysis for the behavioral sciences (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates

Appendix II.

Ordinal Variables – Rating Scale and Description

Variables	Scale & Description
Deficiency Claim Amount (RM)	1=Very low
	2=Low
	3=Fairly moderate
	4=Moderate high
	5=Fairly high
	6=High
	7=Very high
Taxable Sales (Annual - 2012)	1=Very low
	2=Low
	3=Fairly moderate
	4=Moderate high
	5=Fairly high
	6=High
	7=Very high
Tax Return Submission (Up-To-Date)	1=Very bad
	2=Bad
	3=Fairly bad
	4=Moderate bad
	5=Fairly high
	6=High
	7=Very high

Penalty on Return	1=None
	2=Low
	3=Moderate
	4=Fairly high
	5=High
	6=Very high
Taxpayer Compliance Level	1=Very bad
	2=Bad
	3=Fairly bad
	4=Moderate bad
	5=Fairly good
	6=Good
	7=Very good