"Is deterrence approach effective in combating tax evasion? A meta-analysis"

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IS DETERRENCE APPROACH EFFECTIVE IN COMBATING TAX EVASION? A META-ANALYSIS

Abstract

The purpose of this paper is to present the results of a meta-analysis of the relationship between determinant factors and tax evasion based on deterrence approach. Using the meta-analysis method, each statistical result of empirical studies is converted into r-pearson as standardized effect size, and then synthesized into a mean effect size in order to increase power and to resolve uncertainty. Theoretically, increasing audit, tax rate and tax penalty will decrease tax evasion. However, the results show that only tax rate has a significant impact on tax evasion. Synthesizing totally 478 outcomes from articles published between 1978 and 2018, there is a robust conclusion that decreasing tax rate is an effective tool in combating tax evasion. On the other hand, audit and penalty are not significant in influencing tax evasion. In addition, the results of heterogeneity analysis suggest that national culture and income level of the country are useful in explaining the impact of audit, tax rate and tax penalty on tax evasion. These findings should be of interest to policymakers. First, instead of sacrificing more resources in conducting audit or imposing more penalty, tax authorities should consider setting the tax rate as low as possible to diminish tax evasion. Second, considering that culture and income level influence the impact of audit and penalty on tax evasion, policymakers should consider national cultural values and income level condition when designing audit techniques and setting penalty structures.

Keywords   tax evasion, meta-analysis, enforcement paradigm,
                     deterrence approach, audit, tax rate, penalty

JEL Classification   H23, K42

INTRODUCTION

Tax evasion is an illegal action to reduce tax liability in a way that may be unintended by tax law (Franzoni, 1999). As a complicated phenomenon, tax evasion generates many problems in many countries. Direct effect of tax evasion in economic area is loss in government revenue. For example, in the United States, Internal Revenue Service's (IRS) approximated that between 2008 and 2010, the average annual tax gap was USD 458 billion (IRS, 2016). Decreasing tax revenue also influences social life by diminishing the government's capability in providing public good sand social services (Mehrara & Farahani, 2016).

Combining the work of Kogler, Muehlbacher, and Kirchler (2015) with their "slippery slope framework", and Ritsatos (2014), Alm (2012), and Torgler (2006) who discussed the impact of psychological and behavioral economics on tax compliance and tax evasion, the determinants of tax evasion can be divided into three groups based on the power of control. First, factors that can be controlled by tax authorities, i.e. audit, tax rate and penalty (Alm, 2012; Alm, Kirchler, & Muehlbacher, 2012; Kirchler, Hoelzl, & Wahl, 2008; Ritsatos, 2014). Second, factors that are under the power of the government in a broad sense, i.e. tax service (Alm, 2012) and trust in government (Porta, Lopez-De-Silane,

Shleifer, & Vishny, 1996; Ritsatos, 2014). The last group consists of social norms, personal norms (Alm, 2012; Alm et al., 2012; Kirchler et al., 2008; Ritsatos, 2014) and religiosity (Torgler, 2006) that are the factors under control of taxpayers and their community. Consequently, these three groups are known as enforcement paradigm (Alm, 2012), service and trust paradigm (Alm, 2012) and fiscal psychology paradigm (Schmolders, 1959).

Therefore, the objective of this study is to find the robust conclusion related to the impact of audit, tax rate and penalty on tax evasion. In addition, considering that there is a possibility of heterogeneity in the result of meta-analysis, this study will try to find moderating variable that influences the relationship between these three determinant factors and tax evasion.

In the next section, this paper will describe theoretical background and literature review of tax evasion and deterrence approach. In section 2, the research methodology, including study criteria and coding procedures, will be explained. Findings will be presented and continued by discussion of the result. Conclusion will be presented in the final section.

1. LITERATURE REVIEW

In the research literature, tax evasion is often used interchangeably as an opposite of tax compliance, because both are two opposite sides of the same coin. Consequently, efforts in decreasing tax evasion can be seen as efforts in increasing tax compliance. Initially, the focus of tax compliance and tax evasion research has been dominated by enforcement paradigm. However, in the last decade, political factors and psychological factors are also identified as important aspects that direct people to comply or not.

Although there is a shifting tendency from enforcement paradigm to other paradigms, this study focuses on the impact of audit, tax rate and penalty, which are regarded as deterrent factors due to two main reasons. First, as pointed out by OECD (2015), for taxpayers who habitually often try to manipulate system in order to minimize tax obligation, enforcement programs still are the important tools in combating such behavior. Second, the policy related to deterrence approach is relatively under control of tax administration. Determining tax audit coverage ratio, changing tax rate, and deciding the level of penalty are easier than trying to influence the tax behavior. So, the existence of disobedient taxpayers and full control of tax authority in implementing the deterrence approach become the factors that popularize enforcement paradigm.

Although tax evasion and its determinants based on deterrence approach have been subject to many researches, however, there is no consistent conclusion of the impact of these determinants on tax evasion. Although many studies have been conducted for synthesizing the impact of determinant factors on tax compliance, but, to our knowledge, there is no synthesized research that focuses on tax evasion. For example, Blackwell (2007) reviewed and synthesized 20 experimental studies using meta-analysis method and concluded that audit, fine and public good availability would encourage tax compliance. Hofmann, Voracek, Bock, and Kirchler (2017) explored socio-demographic factors as determinants of tax compliance. Besides the limitations related to the minimal attention of tax evasion aspect, studies that synthesize individual researches also have a tendency to focus on single research method. For example, Blackwell (2007) only used experimental researches, and Hofmann et al. (2017) only focused on survey studies. So, fulfilling the gap, this study will review systematically the studies related to impact of audit, tax rate, and penalty on tax evasion using a meta-analysis method. Capturing the period from 1978 to 2018, this study will review and synthesize the researches, either based on experiment, survey, or regression of secondary data.

Reviewing 86 individual studies published between 1978 and 2018 that consist of 478 findings, this study shows that in general the direction of the influence of deterrent factors is consistent with the prediction of Allingham and Sandmo (1972) and prospect theory (Kahneman & Tversky, 1979). Audit and penalty create positive impact on tax

compliance, while increasing tax rate tends to induce tax evasion. However, despite of the consistency with the related theories, the effect of increasing audit and penalty in combating tax evasion is not significant. Meanwhile, the impact of decreasing tax rate in diminishing tax evasion is statistically significant.

2. TAX EVASION, DETERRENCE APPROACH, AND HYPOTHESES

In general, tax evasion existed when a taxpayer intentionally distorts his actual condition to reduce tax liability. Tax evasion is measured using unpaid tax, undeclared income or unreported tax return (Rizzi, 2017). In order to combat this illegal behavior, the government can use a deterrence-based model or a non-deterrence-based model. The deterrence model refers to the idea that effective action to decrease tax evasion can be achieved by increasing probability of detection and multiplying punishment. Based on economic cost and benefit calculation, factors included in enforcement paradigm such as audit, tax rate, and penalty are popular tools in deterrence approach (Ariel, 2012). On the other hand, many scholars and professionals prefer non-deterrence approach in decreasing tax evasion. This approach is based on the assumption that taxpayers have moral and social obligation and not merely based on maximizing economic utility in their preference to pay taxes (Torgler, Demir, Macintyre, & Schaffner, 2008). Trust and service paradigm (Alm, 2012) and fiscal psychology paradigm (Schmolders, 1959) are two popular efforts in non-deterrence approach. Service (Alm, 2012; Alm, Bloomquist, & McKee, 2017) and trust in government (Kafkalas, Kalaitzidakis, & Tzouvelekas, 2014) are factors included in trust and service paradigm, while personal norms, social norms, and religiosity are factors included in fiscal psychology paradigm.

Although there is a shifting tendency from deterrence to non-deterrence approach, enforcement paradigm is still a popular paradigm in tax compliance and tax evasion research. For example, from 760 papers that discuss determinant factors of tax compliance and tax evasion during the period between 1946 and 2018, 553 papers or 72.7% are exploring enforcement paradigm. A possible factor that causes the popularity of enforcement paradigm is the influence of seminal work of Allingham and Sandmo (1972). Developing economic model of tax compliance process in a logical manner using economic model, popular with EUT-AS model, Allingham and Sandmo (1972) encourage other researches not only to prove the accuracy of the model. The influence of Allingham and Sandmo (1972) on tax compliance researches is supported by the use of the theory. From 760 papers, around 10 theories are used. Totally, the theories are explicitly mentioned 505 times, and 399 (79%) of them are EUT-AS model.

The basic theory in tax evasion researches started with the economics of crime model (EUT-AS model). Based on expected utility theory (EUT), a taxpayer is assumed to have a fixed amount of income (Y). The taxpayer has to determine how much income to be reported (R). With the tax rate of t, audit probability of p, and penalty rate of f, the income is $Y_n = Y - tR$, if evaded income is undetected. If tax authority successfully catches the evading tax and then imposed penalty, the income is $Y_d = Y - tR - f\left(t\left(1-R\right)\right)$. The taxpayer is assumed as rational person that maximizes expected utility of EU $\left(Y\right) = pU\left(Y_d\right) + \left(1-p\right)U\left(Y_n\right)$ (Alm, 2012).

However, following Dhami and Al-Nowaihi (2007), beside of its rationality in predicting the impact of audit and penalty on decreasing tax evasion, EUT will be ended with Yitzhaki's puzzle related to the impact of tax rate changes on tax evasion. According to Yitzhaki (1974), increasing tax rate would decrease income. With declining or constant absolute risk aversion, declining income would induce the taxpayer to decrease the risky decision, i.e. tax evasion. Therefore, a rise in tax rate discourages tax evasion, the prediction that is in contrast with many empirical researches. To answer the puzzle, Dhami and Al-Nowaihi (2007) proposed prospect theory (Kahneman & Tversky, 1979) to predict the impact of tax rate. Different from EUT-AS model that assumed the carrier of utility as final levels of wealth, the prospect theory assumes that the utility function is based on five main factors, i.e. reference point dependence, decreasing sensitivity, loss aversion, non-linearity

in weighting of probabilities, and susceptibility to framing effects. Under prospect theory, increasing tax rate will increase the amount evaded, and hence decrease tax compliance.

Although EUT predicts that increasing probability of audit and penalty will decrease tax evasion and prospect theory predicts that increasing tax rate will increase tax evasion, there is a possibility that the degree of influence may be different among countries. Following Tsakumis, Curatola, and Porcano (2007), Richardson (2008), and Besley and Persson (2014), factors such as culture and income level may influence the relationship. Culture is collective ideas found in the society's mind, which differentiate its members with people in other societies (Hofstede, 1980). Culture influences many aspects of people's life, including their view toward taxation (Richardson, 2008; Tsakumis et al., 2007). Hofstede (1980) pointed out that cultural characteristic can be described by four important dimensions, namely power distance, individualism, masculinity, and uncertainty avoidance.

Power distance refers to the degree of power gap between ruler and common citizens. Higher power distance indicates wider gap. Individualism refers to the degree of community's tendency between individual achievement and collective interest. Higher individualism indicates greater alignment with individual interest. Masculinity refers to the society's preference for heroism and material achievement. Higher masculinity denotes greater appreciation for material success. Uncertainty avoidance represents the degree of unpleasantness with uncertainty and ambiguity. Higher uncertainty avoidance signals for greater disaffection of vagueness and unpredictability (Hofstede, 1991; G. Hofstede, G. J. Hofstede, & Minkov, 2010).

In addition, income level influences the relationship of audit, tax rate and penalty by feedback of tax policy changes. As pointed out by Mason and Calvin (1978) and Alstadsæter, Johannesen, and Zucman (2017), people in rich countries with a better understanding of tax rules tend to take advantage of loopholes in the tax laws. Gross domestic product per capita (GDP per capita) is an important measure to represent the level of income (Liu, Wang, Zhang, Li, & Kong, 2019).

2.1. Audit

In general, tax audit is defined as all activities undertaken by tax authorities to check whether taxpayers have appropriately paid and reported their tax obligation (Hauptman, Horvat, & Korez-Vide, 2014). In the literatures, audit is measured by audit probability or audit rate (Cason, Friesen, & Gangadharan, 2016; Forest & Kirchler, 2010; Konrad, Lohse, & Qari, 2014), frequency (Takala & Viren, 2012; Viren, 2015), time of audit such as previous audit (Klepper & Nagin, 1989) or future audit (Maciejovsky, Kirchler, & Schwarzenberger, 2007) and cost of audit (Beck & Lisowsky, 2013; Blackwell & McKee, 2012; Hartl, Hofmann, Gangl, Hartner-Tiefenthaler, & Kirchler, 2015).

Following EUT-AS model, increasing audit will decrease tax evasion. By conducting audit, tax authority can find evaded tax. If caught, a taxpayer has to pay the amount of tax evaded plus penalty. Repaying evaded tax plus tax fine will decrease total expected utility, and hence discourage tax evasion. Although theoretically giving positive impact, many empirical researches have demonstrated that the impact of audit on tax compliance is not as strong as expected and tends to be inconsistent (Kirchler et al., 2008). For example, D'Agosto, Manzo, Pisani, and D'Arcangelo (2018), concluded that in terms of deterrence, tax audit had a negative impact on tax evasion. In addition, Kleven, Knudsen, Kreiner, Pedersen, and Saez (2011) pointed out that prior audit and threat-of-audit letters created a significant impact on self-reported employed, but no impact on third-reported income. On the other hand, Slemrod, Blumenthal, and Christian (2001) indicated that raising audit probability gave a negative impact on tax compliance of high income taxpayers. Based on the explanation, the research hypothesis is formulated as follows:

H1: *Tax audit has a negative impact on tax evasion.*

2.2. Tax rate

One of the most disputable topics in tax compliance researches is related to the effect of tax rates on reported income. Tax rate, usually expressed as a percentage, is the ratio at which a person or

enterprise is taxed (Lohrey, 2019). In the literature, tax rate is measured by general or statutory tax rate (Sinnasamy & Bidin, 2017; Williams, 2015), marginal tax rate (Cebula, 2014; Yusof, Ling, & Wah, 2014), effective tax rate (Beck & Lisowsky, 2013), progressive tax rate, maximum rate (Cebula, 2013) or special rate (Kim, 2008).

The economic model of Allingham and Sandmo (1972) divided the impact of tax rate on tax evasion into two parts, i.e. substitution and income effect. Substitution effect clearly creates a negative impact of tax rate on tax compliance. Increasing tax rate will increase tax obligation. Evading taxes on the margin will be more profitable. Different from substitution effect, income effect of tax rate change on tax compliance can be positive, zero, or negative, depends on absolute risk aversion characteristic.

However, EUT-AS model's prediction related to the impact of tax rate changes still creates a puzzle. As pointed out by Yitzhaki (1974), using EUT-AS model under the plausible assumption of decreasing absolute risk aversion, there was no substitution effect and only pure income effect existed. Consequently, raising tax rates would reduce tax evasion. The prediction was contradictive with many empirical researches (Dhami & Al-Nowaihi, 2007). To overcome this puzzle, Dhami and Al-Nowaihi (2007) offered prospect theory (Kahneman & Tversky, 1979) to explain the impact of tax rate changes on tax compliance behavior. Different from EUT-AS model that creates ambiguity in predicting the impact of tax rate on tax compliance, prospect theory clearly predicts that an increase in tax rate will induce the amount evaded, and hence will decrease tax compliance (Dhami & Al-Nowaihi, 2007). Although many researches such as the work of Alm, Sanchez, and De Juan (1995) supported Yitzhaki's position, but Yaniv's prediction of negative relationship between tax rate and tax compliance has been confirmed by more empirical researches (see, for example, Alstadsæter & Jacob, 2016; Kanagaretnam, Lee, Lim, & Lobo, 2016; Park & Hyun, 2003; Pommerehne & Weck-Hannemann, 1996). Based on the explanation, the research hypothesis is formulated as follows:

H2:   *Tax rate has a positive impact on tax evasion.*

2.3. Penalty

Penalty is defined as punishments enacted by tax law for taxpayers who carry out prohibited actions or are not compliant in fulfilling tax obligations (Burton, 2007). In the literature, tax penalty is measured by penalty rate (Cebula, 2003, 2014; Hartl et al., 2015), experience of being penalized (previous penalty) (Coricelli, Joffily, Montmarquette, & Villeval, 2010), and other enforcement action by tax authority (Kanagaretnam et al., 2016; Kastlunger, Lozza, Kirchler, & Schabmann, 2013).

Different from ambiguity effect of tax rate, imposing tax fine is predicted to improve tax compliance. Consistent with traditional model of EUT, multiplying penalty for the evaders will create deterrent effect on other taxpayers that try to involve in tax evasion. Although many studies have supported this prediction (see, for example, Konrad et al., 2014; Park & Hyun, 2003), other researchers have showed the opposite conclusions (see, for example, Di Porto, 2011; Yusof et al., 2014). Based on the explanation, the research hypothesis is formulated as follows:

H3:   *Tax penalty has a negative impact on tax evasion.*

2.4. Moderator variables

Citizens in high power distance countries tend to rely heavily upon the authorities (Hofstede et al., 2010). On the one hand, high dependence of citizens on their government simplifies the authority to carry out policies such as audit without much criticism or protest. Thus, increasing audit or penalty will create fear for tax evaders and hence tax evasion will decrease. On the other hand, the great power of authority might encourage the creation of a tax system that benefits those who hold power. The unfair system increases public disillusionment and distrust of government's action and hence encourages tax evasion (Richardson, 2008).

People in a high individualism country tend to focus on personal interest (Hofstede et al., 2010). On the one hand, protection of individual rights encourages the establishment of a fair tax system that applies to everyone, not just a certain group of

people (Richardson, 2008). When a tax authority conducts audit or changing tax rate, people in the country believe that this policy is implemented to satisfy public interest, punish tax evaders and encourage people to be more compliant. On the other hand, prioritizing personal interests encourages taxpayers to enrich themselves by evading taxes.

In high masculinity countries, people have a tendency of profit and material orientation that can lead to a corrupt behavior such as evading tax (Husted, 1999). So, people try to circumvent government policies in various ways for their personal interests. However, there is a possibility that people in high masculinity tend to be less tolerant with lawbreakers, because they believed that illegal activities harm their interests. So, when audit is conducted by tax authorities and penalty imposed assertively, tax evasion will decrease (Richardson, 2008; Tsakumis et al., 2007).

To reduce uncertainty, people in high uncertainty avoidance countries tend to create many formal laws (Hofstede et al., 2010), including in taxation area. On the one hand, the existence of written regulation helps people as guidance in obeying tax rule. However, excessive rules make tax system complex and baffle taxpayers in fulfilling their tax obligation (Richardson, 2008; Tsakumis et al., 2007).

Furthermore, implementing tax policy such as audit, tax rate or penalty will be responded by taxpayers. The feedback of taxpayers in rich countries (upper-middle income and high-income countries) may be different with taxpayers in poor countries (low-income and lower-middle-income countries). In poor countries, which are usually characterized by low education level, bargaining power of people is not as big as people in rich countries. So, reducing tax evasion using audit or penalty in rich countries may create fear to people and discourage tax evasion. However, as pointed out by Varma and Doob (1998), the effectiveness of the deterrence approach depends on the comparison between the possible losses due to being caught with the possible benefits of evading taxes. In rich countries, which generally dominated by rich people, the probability of gain is greater than cost of being

caught and punished. In addition, with better education level, taxpayers in rich countries can avoid audit or punishment easier than people in poor countries.

Based on this explanation, the hypotheses are:

H1a: Power distance moderates the relationship between audit and tax evasion.

H1b: Individualism moderates the relationship between audit and tax evasion.

H1c: Masculinity moderates the relationship between audit and tax evasion.

H1d: Uncertainty avoidance moderates the relationship between audit and tax evasion.

H1e: Income level moderates the relationship between audit and tax evasion.

H2a: Power distance moderates the relationship between tax rate and tax evasion.

H2b: Individualism moderates the relationship between tax rate and tax evasion.

H2c: Masculinity moderates the relationship between tax rate and tax evasion.

H2d: Uncertainty avoidance moderates the relationship between tax rate and tax evasion.

H2e: Income level moderates the relationship between tax rate and tax evasion.

H3a: Power distance moderates the relationship between penalty and tax evasion.

H3b: Individualism moderates the relationship between penalty and tax evasion.

H3c: Masculinity moderates the relationship between penalty and tax evasion.

H3d: Uncertainty avoidance moderates the relationship between penalty and tax evasion.

H3e: Income level moderates the relationship between penalty and tax evasion.

3. METHODOLOGY

3.1. Study criteria

The papers included in this review were identified by a systematic process. Literature search was conducted on National Library of Indonesia (e-resources.perpusnas.go.id), Brawijaya University's Library (digilib.ub.ac.id), and Ausaid alumni database journal (infotrac.galegroup.com). Papers were obtained by optimizing online journal databases (Proquest, JSTOR, ScienceDirect, Emerald, Sage, Wiley and Gale) for the period between 1945 and 2017.

Literature search process was initially conducted by categorizing the searching group by three determinants of tax evasion, i.e. audit, tax rate, and penalty. In each group, 'tax evasion' was used as the keyword of dependent variables. Combining with the related independent variable, relevant papers of each group were obtained. For example, in the first group, where audit was the determinant factor, the term 'tax evasion' and the terms 'audit', 'audit probability', 'audit rate' were used as the keywords. In the second group, 'tax rate' was used as an additional keyword. In the third group, combining terms were 'fine' and 'penalty'.

To be included in this study, papers must have the following three criteria: (1) papers used tax evasion as the focus of study, (2) papers examined minimally one of three determinants, (3) papers should be quantitative or based on empirical data, (4) papers should consist of sufficient statistical data that can be converted into r-pearson.

Initially, 760 papers were obtained. After screening process based on deterrence approach, 553 papers which discussed audit, tax rate and penalty were selected. Furthermore, based on quantitative content, 370 non-empirical papers were eliminated, and the rest of 183 empirical papers were continued to be processed. Then, based on adequacy of statistical data, 133 papers were processed. Finally, after considering the joint paper, in which there is a possibility that one paper discussed more than one independent variable, 86 papers were selected. Different with initial 760 papers that capture the period 1945–2018, 86 articles selected in this study cover the period 1978–2018.

3.2. Coding procedure

Coding process was conducted by classifying the data from relevant papers into four groups. The first group was the general identification of papers, the second was the main content, the third was the identification of dependent variables, and the forth group was differentiating non-empirical papers with empirical papers and simultaneously identifying independent variables categories. In the first group, each paper was named with a unique code structure, which represented downloading process, journal publisher, year of publishing, independent variable, and main author.

In the second group, coding was conducted to identify the dominant theory, country, government level, methodology, sample used, and unit analysis. In the third group, dependent variable used and its measurement were coded. In the fourth group, detailed data of each related independent variable were coded, including the measurement, type, magnitude of statistical data, sample used, and significant level.

3.3. Overview of the meta-analyses procedures

Initially, vote-counting method was used to analyze and test the hypotheses. The decision of accepting or rejecting the hypotheses was based on the majority of findings. However, as noted by Gurevitch, Koricheva, Nakagawa, and Stewart (2018), vote-counting method may lead to spurious conclusion, So, to investigate further about the strength and the size of the influence of audit, tax rate, and penalty on tax evasion, meta-analysis method (Card, 2012; Hunter & Schmidt, 2004; Littell, Corcoran, & Pillai, 2008) was used.

In the meta-analysis method, after collecting, coding and selecting sample studies, several further steps should be done as follows (Ellis, 2010; Hunter & Schmidt, 2004):

1. Transforming statistical result of each individual studies in a standardized form. Following Rosenthal and DiMatteo (2001), this study prefers r-pearson as standardized form of ef-

fect size. Besides the simplicity of calculation, r-pearson is also simple to be interpreted in practical terms. In this analysis, original values of statistical test result of sample studies are converted into r-pearson following Rosenthal and DiMatteo (2001), Ellis (2010), Card (2012), Borenstein, Hedges, Higgins, and Rothstein (2016).

2. Calculating a mean effect size $(\overline{r})$. With n_i and r_i representing the sample size and correlation in each study i, the formula of the mean effect size is:

$$\overline{r} = \frac{\sum n_i r_i}{\sum n_i}.$$

3. Computing the statistically significant of the mean. With notation of n and r being similar as before and k referring to the number of studies, this step is started with calculation of the variance of the sample of correlations (V_r), standard error (SE_r) and Z score using the following formula:

$$V_{\overline{r}} = \frac{\sum n_i (r_i - \overline{r})^2}{\sum n_i}, \; SE_{\overline{r}} = \sqrt{\frac{V_{\overline{r}}}{k}}, \; Z = \frac{|\overline{r}|}{SE_{\overline{r}}}.$$

Then, determining whether the probability of obtaining this Z score is less than 0.05 using Excel formula of "=NORM. S. DIST (Z, FALSE)". As another alternative, we can compute a 95% confidence interval with the formula of:

$$\left[\overline{r} \mp Z_{\alpha/2} SE_r \right] \text{ or } \left[\overline{r} \mp 1.96 x SE_r \right].$$

4. Testing the hypothesis. If the result of Excel formula above is less than 0.05 $(p(Z) < 0.05)$ or the interval excludes the null value of zero, we can conclude that the mean effect size is statistically significant. Combining the significance and the consistency of the direction between the mean effect size and the hypotheses, we can decide to reject or accept the hypotheses.

5. Examining the heterogeneity in order to identify potential moderating variables. In testing the heterogeneity, the formula of Q statistic (Hunter & Schmidt, 2004) as cited by Ellis (2010) is as follows:

$$Q = \sum \frac{\left[(n_i - 1)(r_i - \overline{r})^2 \right]}{\left(1 - \overline{r}^2 \right)^2}.$$

A Q statistic that exceeds the critical value of x^2_{k-1}, where k is the number of effect size (or number of findings used in the model), leads to the conclusion that population effect sizes are heterogeneous. It motivates to find moderating variables.

6. Identifying moderating variables. Following Hedges and Pigott (2004), Card (2012) and Anderson, d'Orey, Duvendack, and Esposito (2018), potential moderating variables can be obtained by regressing r-pearson of each finding on a measure of independent variable and other explanatory variables using this econometric model:

$$r_i = \beta_0 + \sum_m \delta_m D_{im} + \sum_n \beta_n X_{in} +$$
$$+ \sum_w \partial_w CV_{iw} + \gamma_0 SE_i + \varepsilon_i.$$

Where r refers to r-pearson value of each model resulted from the first step, D is a set of dummy variables representing different measurement of independent variables, X is a set of main explanatory variables considered to affect the relationship between determinant factors and tax evasion such as culture and income level. Following Tsakumis, Curatola, and Porcano (2007) and Richardson (2008), culture is represented by Hofstede's cultural dimension (G. Hofstede, G. J. Hofstede, & Minkov, 2010). Income level is represented by gross domestic product (GDP) per capita (World Bank, 2017). To control the influence of other factors, CV is included and represents control variables such as tax type, group of countries, or research methodology used in original articles. Furthermore, considering the possibility of publication bias such as pointed out by Borenstein et al. (2016) and Hunter and Schmidt (2004), SE that represents standard error of each findings' correlation is included in the model (Anderson et al., 2018). Following Ellis (2010), SE is calculated using the formula

$$SE = \sqrt{\left[4 \left(1 + \left(d_i^2 / 8 \right) \right) \right] / n_i},$$

where d refers to Cohen's d that can be calculated from r by the formula $d = 2r/\sqrt{1-r^2}$. ε is the error term, with subscript i indicating finding.

Although the econometric model above includes relatively complete explanatory variables, but considering rationality and theoretical justification (Laroche & Soulez, 2012), the potential moderator is limited to culture (Richardson, 2008; Tsakumis et al., 2007), income level (Allingham & Sandmo, 1972) and the different measurement of independent variables (Anderson et al., 2018). Then, to be accepted as a moderating variable, a variable should influence significantly the relationship between determinant factor and tax evasion. If a coefficient of explanatory variable is statistically significant, shown by t-statistic, it will be considered as a moderator (Anderson et al., 2018). In this study, culture is represented by Hofstede's cultural dimensions that consists of power distance, individualism, masculinity, and uncertainty avoidance (Hofstede, 1991; Hofstede et al., 2010; Richardson, 2008; Tsakumis et al., 2007). Four dimensions are measured by their indices (Hofstede et al., 2010) that represent the level of each dimension.

4. RESULTS

4.1. Data and vote-counting result

There is a probability that a single paper contains more than one independent variable (multi-independent variables) and reports more than one outcome (multiple findings). For example, if grouped separately based on each independent variable, the total number of papers are 133 papers. However, there are 47 papers, which include audit, tax rate and penalty in a single paper. So, using a purposive sampling method, actually 86 papers are used in this meta-analysis. In addition, following Dochy, Segers, Van den Bossche, and Gijbels (2003), if a single research reports multiple results, each result is treated as an independent finding. So, totally 478 outcomes are synthesized in this study. Detailed data of the studies for each independent variable are presented in Table 1. In addition, the composition of country for each independent variable is presented in Figures 1 and 2.

Table 1. The paper composition

Variables	Data	1978–1989	1990–1999	2000–2009	2010–2018	Total
AUDIT	Papers	13	10	7	24	54
	Findings	26	32	33	75	166
TAX RATE	Papers	6	7	10	19	42
	Findings	13	33	50	89	185
PENALTY	Papers	7	4	6	20	37
	Findings	12	11	34	70	127
TOTAL	Papers	26	21	23	63	133*
	Findings	51	76	117	234	478
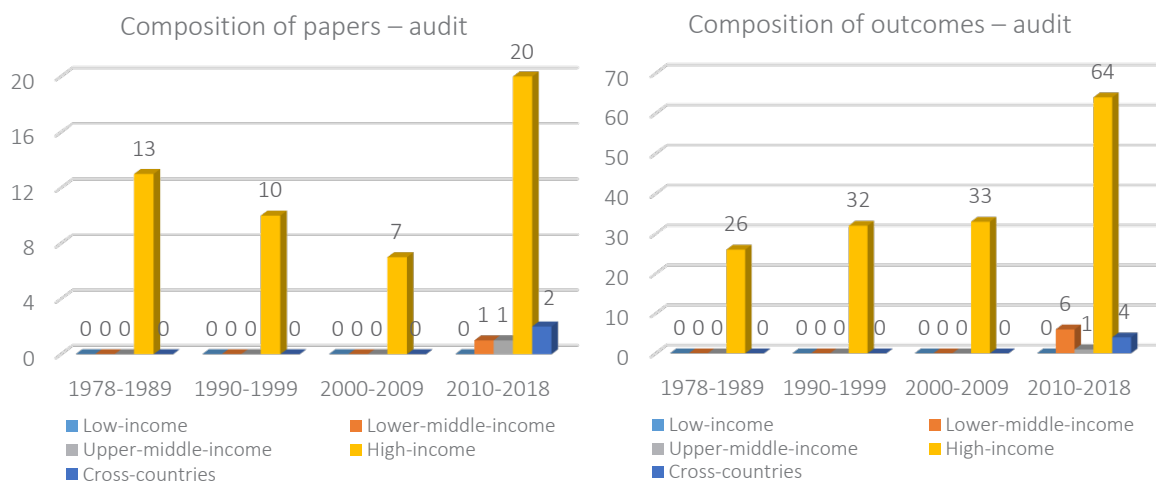
Figure 1. Composition of papers and outcomes – audit

Figure 2. Composition of papers and outcomes – penalty

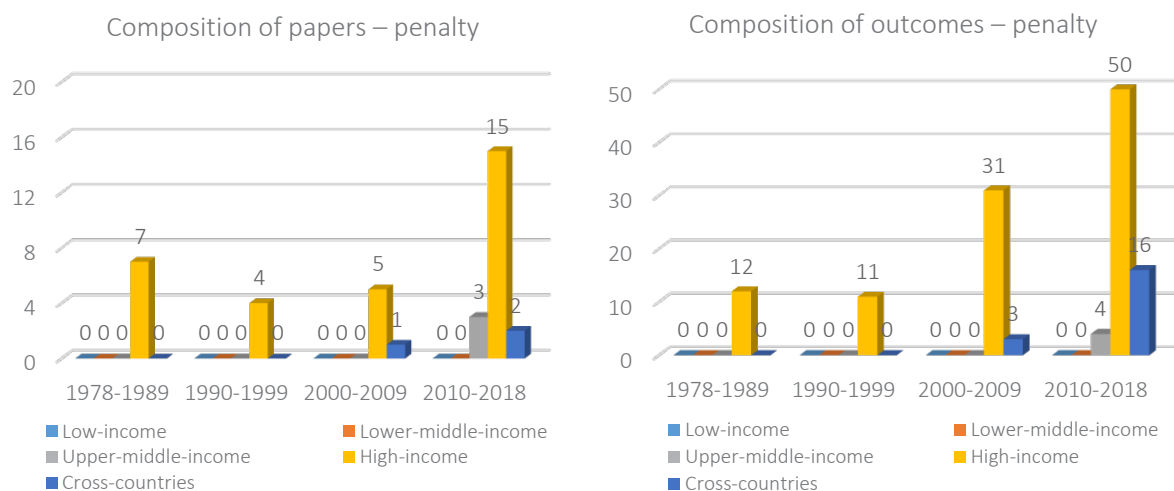Table 1 shows that, in general, tax evasion researches increase steadily during the period 1978–2009 and increase significantly in the last decade. However, although being in increasing trend, the composition of paper and outcomes is mainly dominated by high-income countries for all decades such as presented in Figures 1 and 2. Then, in contrast to the research of audit and penalty, which are dominated by research in rich countries and rise significantly in the last decade, the research related to the effect of tax rates on tax evasion is relatively spread evenly along the four decades and among the group of countries, including poor countries.

Furthermore, the results of testing the hypotheses using vote-counting method for each independent variable per decade are presented in Tables 2, 3, and 4.

To a large extent, the results in Table 2 confirm expected utility theory (EUT) (Allingham & Sandmo, 1972) and prospect theory (Kahneman & Tversky, 1979) as described in section 2. As predicted by EUT, increasing audit probability and penalty will decrease tax evasion (Allingham & Sandmo, 1972). In general, Tables 2 to 4 show that hypotheses H1, H2, and H3 are supported by the results of vote-counting method. In audit, of the 166 estimates, 107 show a negative relationship, of

Table 2. Results – vote-counting method – audit

Year	Significance	Number of outcomes			Percentage of outcomes			Hypothesis test		
		Positive	Negative	Total	Positive	Negative	Total	Majority of outcomes	Hypothesis	Supported?
1978	Significant	6	11	17	23.08	42.31	65.38	Negative	H1	Yes
1989	Not significant	1	8	9	3.85	30.77	34.62	Significant		
1990	Significant	7	7	14	21.88	21.88	43.75	Negative	H1	No
1999	Not significant	7	11	18	21.88	34.38	56.25	Not-significant		
2000	Significant	6	15	21	18.18	45.45	63.64	Negative	H1	Yes
2009	Not significant	6	6	12	18.18	18.18	36.36	Significant		
2010	Significant	12	38	50	16.00	50.67	66.67	Negative	H1	Yes
2018	Not significant	14	11	25	18.67	14.67	33.33	Significant		
All	Significant	31	71	102	18.67	42.77	61.45	Negative	H1	Yes
Year	Not significant	28	36	64	16.87	21.69	38.55	Significant		
Total outcomes		59	107	166	35.54	64.46	100.00	–	–	–

Table 3. Results – vote-counting method – tax rate

Year	Significance	Number of outcomes			Percentage of outcomes			Hypothesis test		
		Positive	Negative	Total	Positive	Negative	Total	Majority of outcomes	Hypothesis	Supported?
1978	Significant	11	0	11	84.62	0.00	84.62	Positive	H2	Yes
1989	Not significant	2	0	2	15.38	0.00	15.38	Significant		
1990	Significant	14	5	19	42.42	15.15	57.58	Positive	H2	Yes
1999	Not significant	11	3	14	33.33	9.09	42.42	Significant		
2000	Significant	34	2	36	68.00	4.00	72.00	Positive	H2	Yes
2009	Not significant	12	2	14	24.00	4.00	28.00	Significant		
2010	Significant	60	2	62	67.42	2.25	69.66	Positive	H2	Yes
2018	Not significant	21	6	27	23.60	6.74	30.34	Significant		
All	Significant	119	9	128	64.32	4.86	69.19	Positive	H2	Yes
Year	Not significant	46	11	57	24.86	5.95	30.81	Significant		
Total outcomes	59	165	20	185	89.19	10.81	100.00	–	–	

Table 4. Results – vote-counting method – penalty

Year	Significance	Number of outcomes			Percentage of outcomes			Hypothesis test		
		Positive	Negative	Total	Positive	Negative	Total	Majority of outcomes	Hypothesis	Supported?
1978	Significant	2	6	8	16.67	50.00	66.67	Negative	H3	Yes
1989	Not significant	1	3	4	8.33	25.00	33.33	Significant		
1990	Significant	3	0	3	27.27	0.00	27.27	Negative	H3	No
1999	Not significant	2	6	8	18.18	54.55	72.73	Not-significant		
2000	Significant	0	24	24	0.00	70.59	70.59	Negative	H3	Yes
2009	Not significant	3	7	10	8.82	20.59	29.41	Significant		
2010	Significant	6	38	44	9.38	59.38	68.75	Negative	H3	Yes
2018	Not significant	7	13	20	10.94	20.31	31.25	Significant		
All	Significant	11	68	79	8.66	53.54	62.20	Negative	H3	Yes
Year	Not significant	19	29	48	14.96	22.83	37.80	Significant		
Total outcomes	30	97	127	23.62	76.38	100.00	–	–	–	

which 71 are statistically significant, i.e. higher (lower) probability of audit is associated with lower (higher) level of tax evasion. Similarly, in penalty, of the 127 estimates, 97 display a negative relationship and 68 of them are significant. This indicates that higher penalty tends to decrease tax evasion. On the other hand, consistent with prospect theory's prediction, increasing tax rate will induce tax evasion (Dhami & Al-Nowaihi, 2007). Of the 185 estimates, 165 display a positive relationship and 119 of them are significant. This shows that higher (lower) tax rate is associated with higher (lower) tax evasion. If investigated further based on the result for each decade, almost all the hypotheses are supported for all decades, except for audit and penalty in the decade of 1990–1999. Although the direction is still consistent with EUT, the relationships in this decade are not significant.

However, as noted by Haddaway, Woodcock, Macura, and Collins (2015) and Gurevitch, Koricheva, Nakagawa, and Stewart (2018), vote-counting results such as in Table 2 should be treated with caution, since there is probability that vote-counting result could lead to spurious conclusion. They provide only limited information related to the distribution of estimates, but they say nothing about the strength and size of the relationship.

4.2. Meta-analysis result

In this sub-section, we present the results of our meta-analysis designed to confirm whether there is any evidence of a relationship between determinant factors (i.e. audit, tax rate, and tax penalty) and tax evasion. Following the procedures

described in Section 3, the results for each independent variable are presented in Tables 5 to 7. To describe the trend of research, data per decade and all decades are presented in each table.

Tables 5 to 7 show that, as predicted by EUT and prospect theory, the direction of effect size is consistent with related theories. Audit and penalty have a negative relationship with tax evasion, while tax rate shows a positive relationship with tax evasion.

However, different from tax rate that displays a significant impact, the effect of audit and penalty on tax evasion is not significant. As shown by probability of Z value and the range of 95% confidence interval, hypothesis 1 which states that tax audit has a negative and significant relationship is rejected by the result of meta-analysis ($r = -0.015$, $p = 0.14$, 95% $CI = (-0.035; 0.005)$). So, increasing tax audit is not an effective tool in decreasing tax evasion. On the other hand, this meta-analysis also shows that hy-

Table 5. Hypothesis testing – meta-analysis – audit

Period	Total sample (Σn)	Outcomes (k)	Mean effect size ($\check{r}$)	SE ($\check{r}$)	$Z = |\check{r}|/SE$	Hypothesis test					Heterogeneity test		
						$p(Z)$	95% CI-lower	95% CI-upper	Hypothesis	Supported	Q statistic	χ^2 cv	Heterogen?
1978–1989	13,117	26	(0.078)	0.022	3.50	0.00	(0.121)	(0.034)	H1	Yes	168	38	Yes
1990–1999	33,271	32	(0.008)	0.014	0.54	0.35	(0.036)	0.020	H1	No	216	45	Yes
2000–2009	20,493	33	(0.075)	0.023	3.26	0.00	(0.120)	(0.030)	H1	Yes	359	46	Yes
2010-2018	784,174	75	(0.013)	0.015	0.83	0.28	(0.043)	0.017	H1	No	13,844	95	Yes
All	851,055	166	(0.015)	0.010	1.47	0.14	(0.035)	0.005	H1	No	14,440	196	Yes

Table 6. Hypothesis testing – meta-analysis – tax rate

Period	Total sample (Σn)	Outcomes (k)	Mean effect size ($\check{r}$)	SE ($\check{r}$)	$Z = |\check{r}|/SE$	Hypothesis test					Heterogeneity test		
						$p(Z)$	95% CI-lower	95% CI-upper	Hypothesis	Supported	Q statistic	χ^2 cv	Heterogen?
1978–1989	55,770	13	0.034	0.020	1.76	0.08	(0.004)	0.073	H2	No	275	21	Yes
1990–1999	39,643	33	0.070	0.046	1.54	0.12	(0.019)	0.160	H2	No	2,761	46	Yes
2000–2009	36,781	50	0.098	0.025	3.99	0.00	0.050	0.146	H2	Yes	1,134	66	Yes
2010–2018	1,540,246	89	0.017	0.011	1.53	0.12	(0.005)	0.038	H2	No	16,079	111	Yes
All	1,672,440	185	0.020	0.008	2.48	0.02	0.004	0.036	H2	Yes	20,562	217	Yes

Table 7. Hypothesis testing – meta-analysis – penalty

Period	Total sample (Σn)	Outcomes (k)	Mean effect size ($\check{r}$)	SE ($\check{r}$)	$Z = |\check{r}|/SE$	Hypothesis test					Heterogeneity test		
						$p(Z)$	95% CI-lower	95% CI-upper	Hypothesis	Supported	Q statistic	χ^2 cv	Heterogen?
1978–1989	10,419	12	(0.032)	0.032	1.00	0.24	(0.094)	0.030	H3	No	126	20	Yes
1990–1999	1,151	11	0.052	0.032	1.66	0.10	(0.010)	0.115	H3	No	13	18	Yes
2000–2009	18,283	34	(0.123)	0.037	3.31	0.00	(0.196)	(0.050)	H3	Yes	884	47	Yes
2010–2018	1,022,091	70	(0.012)	0.010	1.30	0.17	(0.031)	0.006	H3	No	6,595	89	Yes
All	1,051,944	127	(0.015)	0.008	1.90	0.07	(0.030)	0.000	H3	No	7,818	153	Yes

pothesis 2 which states that tax rate has a positive and significant relationship with tax evasion is supported by the result of this study ($r = -0.020$, $p = 0.02$, 95% $CI = (0.004; 0.036)$). Higher (lower) tax rate is associated with higher (lower) tax evasion. Similar to audit, hypothesis 3 which states that tax penalty has a negative relationship with tax evasion is also rejected by the result of meta-analysis ($r = -0.015$, $p = 0.07$, 95% $CI = (-0.030; 0.000)$). However, if investigated further, looking at the data for each decade, the results of this meta-analysis show that the impact of audit, tax rate, and penalty on tax evasion is not entirely convincing.

4.3. Heterogeneity analysis

Tables 5 to 7, as shown by value of Q statistic, indicates that a certain degree of heterogeneity exists

in the meta-analysis (audit, Q statistic = 14,440, X^2 critical value = 196, $p < 0.001$; tax rate, Q statistic = 20,562, X^2 critical value = 217, $p < 0.001$; penalty, Q statistic = 7,818, X^2 critical value = 153, $p < 0.001$). Following Anderson et al. (2018), to identify what drives to this heterogeneity and obtain moderator variables, we adopt procedures as described in Section 3. The results of regression of r-pearson on culture, national income and other explanatory variables using STATA is presented in Tables 8 to 10.

Focusing on two main groups, i.e. culture and income level, Table 8 shows that for audit as the determinant factor, coefficient of power distance, uncertainty avoidance and income level are statistically significant (at 5% significance level). So, this meta-analysis supports H1a, H1d and H1e, while

Table 8. Moderator variables – audit

Variable	Coef.	t-value	p > |t|	Hypothesis	Supported?
Power distance – Hofstede	(0.014)	(5.420)	0.000	H1a	Yes
Individualist – Hofstede	0.002	0.940	0.347	H1b	No
Masculinity – Hofstede	0.002	1.130	0.260	H1c	No
Uncertainty avoidance – Hofstede	0.008	2.810	0.006	H1d	Yes
GDP per capita	0.011	4.680	0.000	H1e	Yes
IV measurement – audit in general	0.151	1.670	0.098	–	–
IV measurement – audit probability	(0.046)	(0.640)	0.524	–	–
IV measurement – previous audit	(0.077)	(0.960)	0.339	–	–
Tax type – all taxes	(0.177)	(1.780)	0.077	–	–
Tax type – income tax	(0.086)	(0.920)	0.360	–	–
Standard error of r_i	(0.918)	(7.920)	0.000	–	–
Constant	(0.069)	(0.190)	0.853	–	–
N	148	–	–	–	–
F-value	16.020	–	–	–	–
R^2	0.758	–	–	–	–

Table 9. Moderator

Variable	Coef.	t-value	p > |t|	Hypothesis	Supported?
Power distance – Hofstede	0.002	0.550	0.587	H2a	No
Individualist – Hofstede	0.000	0.060	0.949	H2b	No
Masculinity – Hofstede	0.000	0.140	0.889	H2c	No
Uncertainty avoidance – Hofstede	0.003	1.010	0.317	H2d	No
GDP per capita	0.001	0.540	0.590	H2e	No
IV measurement – tax rate in general	0.310	1.690	0.093	–	–
IV measurement – marginal tax rate	0.248	1.390	0.168	–	–
IV measurement – tax rate – progressive	0.335	1.830	0.069	–	–
IV measurement – tax rate maximum	0.390	2.070	0.041	–	–
Tax type – all taxes	(0.026)	(0.150)	0.884	–	–
Tax type – income tax	0.054	0.590	0.558	–	–
Standard error of r_i	0.870	4.410	0.000	–	–
Constant	(0.958)	(2.430)	0.017	–	–
N	151	–	–	–	–
F-value	6.870	–	–	–	–
R^2	0.612	–	–	–	–

Table 10. Moderator variables – penalty

Variable	Coef.	t-value	p > |t|	Hypothesis	Supported?
Power distance – Hofstede	(0.008)	(0.770)	0.445	H3a	No
Individualist – Hofstede	0.026	1.420	0.159	H3b	No
Masculinity – Hofstede	0.017	1.930	0.058	H3c	No
Uncertainty avoidance – Hofstede	0.030	1.470	0.146	H3d	No
GDP per capita	0.012	2.470	0.016	H3e	Yes
IV measurement – penalty in general	0.249	0.540	0.594	–	–
IV measurement – penalty rate	0.942	1.880	0.064	–	–
IV measurement – previous penalty	0.493	0.900	0.369	–	–
IV measurement – other enforcement	0.071	0.150	0.879	–	–
Tax type – all taxes	0.308	1.720	0.089	–	–
Tax type – income tax	0.111	0.470	0.639	–	–
Standard error of r_i	(0.357)	(1.160)	0.249	–	–
Constant	(2.456)	(1.440)	0.155	–	–
N	96	–	–	–	–
F-value	4.940	–	–	–	–
R^2	0.650	–	–	–	–

H1b and H1c are rejected. This indicates that power distance, uncertainty avoidance and income level moderate the relationship between audit and tax evasion. In addition, for tax rate, Table 9 shows that H2a, H2b, H2c, H2d, and H3e are rejected. So, cultural aspect and income level do not influence the relationship between tax rate and tax evasion. Furthermore, in the relationship between penalty and tax evasion, Table 10 shows that the results of this study support H3e, while H3a, H3b, H3c, and H3d are rejected. So, only income level that has a significant impact of the relationship (at 5% significance level).

5. DISCUSSION

Table 1 and Figures 1 and 2 show that during the period 1978–2018, research related to the impact of audit and tax penalty on tax evasion is dominated by high-income countries as research locus. The domination of rich countries group as the research locus shows that the interest of tax evasion researchers from 1980s to 2000s on poor countries was still limited. Although in 2010, poor countries started to get attention, but rich countries' domination is unshakeable. Slightly different, although still dominated by rich countries, researches that focused on tax rate relatively spread evenly along four decades.

The availability of data becomes an important factor that causes the gap of research locus between rich and poor countries. From 1980s to 2000s, a democratic system has been implemented in almost all high-income countries, while, in many poor countries, the struggle of implementing democratic system is started after year 2000 such as occurred in Indonesia with the fall of New Order (Webber, 2006), Yugoslavia with Bulldozer Revolution (Gordy, 2000), followed by the Rose Revolution (2003) in Georgia (Mitchell, 2006), the Orange Revolution (2004) in Ukraine (McFaul, 2007), and the Tulip Revolution (2005) in Kyrgyzstan (Juraev, 2008). The democratic system does not only increase the participation of public, but also enforces governments to be transparent of their policy, including in taxation area. Governments in democratic system are obligated to report the activities that involving public interest such as audit and penalty data. Different from audit and penalty data that are still secret data in countries with low level of democracy, tax rate is an open data, because it is normally included in tax law and will be announced publicly when there is a change. The data composition of tax evasion researches displayed in this study confirms Rajani and Chandio (2004) that stressed the importance of data availability in supporting research.

Furthermore, the results of vote-counting method as presented in Tables 2 to 4 show that H1, H2, and H3 are supported by this research. Using the majority of findings, the relationship between audit and tax evasion is dominated by

negative significant outcomes (42.77%), tax rate and tax evasion is negative significant (64.32%) and penalty and tax evasion is negative significant (53.54%). These results are consistent with the prediction of related theory. As predicted by EUT, increasing audit and imposing penalty will discourage tax evasion, while prospect theory predicts that increasing tax rate will encourage tax evasion.

The concern of Haddaway, Woodcock, Macura, and Collins (2015) and Gurevitch, Koricheva, Nakagawa, and Stewart (2018), related the possibility of spurious conclusion of vote-counting method, is supported by this study. In contrast to vote-counting method that supports the significant influence of audit, tax rate and penalty on tax evasion, the results of meta-analysis as presented in Tables 5 to 7 show that only H2 is supported, while H1 and H3 are rejected. So, decreasing tax rate will decrease tax evasion, while increasing audit and penalty are not effective tools in reducing tax evasion.

Although in a large extent, the impact of tax rate on tax evasion is significant, the insignificant impact for several decades shows that the relationship between tax rate and tax evasion is not as strong as expected. In addition, looking at the magnitude of effect size, although significant, the impact of tax rate in influencing tax evasion is small (*r*-pearson is only 0.02). Combined with insignificant impact of audit and penalty, the results of this study suggest that using deterrence approach is not effective in combating tax evasion and economic calculation as basis of deterrence approach may be not the main motivation in evading tax. This finding support the conclusion of Yeager (2016) and Alm and McClellan (2012).

The failure of audit as an important factor in combating tax evasion is mainly due to the ineffectiveness of audit. EUT assumes ideal condition in which audit is carried out effectively by following standard procedures, auditors have capability to find income or tax unreported by tax evaders, and taxpayers are assumed to be good citizens without efforts to resist or manipulate the audit process. In fact, auditors are not completely capable to find fraudulent and catch tax evaders due to competence and integrity prob-

lem. Moreover, there is a possibility that each taxpayer give different feedback based on their subjective view of taking risk under uncertainty. So, tax audit is not a simple gamble as assumed by EUT-AS model, but involves financial, social psychology and behavioral aspect, either from auditors or taxpayers' side. Consequently, the existence of auditors' incapability and lack of integrity and unexpected feedback of taxpayers influenced by subjective and social value become the possible answers why audit is ineffective to decrease tax evasion.

Ineffectiveness of audit as the possible cause of the failure of audit in minimizing tax evasion is also supported by the results of heterogeneity analysis. As displayed in Table 8, power distance, uncertainty avoidance, and income level influence the relationship between audit and tax evasion. The coefficient of power distance (PD) in Table 8 is negative and significant. This indicates that in high PD countries, higher audit is associated with lower tax evasion relative to low PD countries. This evidence is in line with expectation. PD is defined as the level to which unbalanced power and hierarchy in an organization or a country are accepted by its members. A country with high index of PD is characterized by the domination of the ruler against people, low rationality and low level of public awareness of people's rights (Hofstede et al., 2010). When tax authority implements a deterrence action such as audit, criticism or resistance to the policy is minimal. On the other hand, tax authority has almost all resources to control people, including giving punishment to tax evaders without much protest. Greater power of tax authority raises fear of being caught. So, in higher PD countries, increasing tax audit will decrease tax evasion. This finding confirms Rablen (2014) who stressed the important of audit effectiveness in decreasing tax evasion.

Table 8 also shows that uncertainty avoidance (UA) plays a positive significant role in influencing the relationship between audit and tax evasion. This suggests that in high UA countries, an increase in audit is associated with higher level of tax evasion. Uncertainty avoidance refers to the degree of tolerance for uncertainty and ambiguity of unknown situation. In addition, individuals in

high UA countries tend to engage in risky behavior to decrease uncertainty in unknown situation. Further, individuals in high UA countries have smaller trust in government institutions relative to low UA countries. Combination of risky behavior and lower trust in government becomes possible explanation of increasing tax evasion when government increases audit probability. Low trust induces taxpayers believe that audits carried out by the tax authorities will not be able to find the evaded tax. Risky behavior encourages taxpayers to be more involved in tax evasion in order to diminish uncertainty in unknown situation. So, increasing audit in high UA countries is only ended in higher level of tax evasion. This evidence confirms findings of Tsakumis et al. (2007) and Richardson (2008) which stated that higher index of UA led to higher level of tax evasion. This result is also in line with conclusion of Husted (1999) and Díez-Esteban, Farinha, and García-Gómez (2018) that countries with high index of UA tend to be more tolerant to corrupt behavior.

Despite cultural aspect, Table 8 also shows that income level as represented by GDP per capita influence the relationship between audit and tax evasion. With positive significant coefficient, this infers that in high-income countries, increasing audit tends to increase tax evasion. People in high-income countries are dominated by upper class and upper middle class. Usually, members of upper and upper middle class have better education, which leads to better knowledge of tax rule and fiscal connection. So, there is also greater probability that more educated taxpayers tend to have a better understanding of tax evasion opportunities. This result supports Hashimzade et al. (2016) that the effectiveness of audit is influenced by taxpayers' response.

Taxpayers' feedback that resists auditing process and the capability of taxpayers in countering audit findings inhibit the role of audit in rediscovering hidden taxes or income. Worsening by the problem of capability and integrity of auditors and the possibility of improper procedures, tax audit fails to catch tax evaders. Consequently, audit is not effective in reducing tax evasion.

Different from audit, the impact of decreasing tax rate in decreasing tax evasion is supported

by the result of this study. Interestingly but unsurprisingly, Table 9 shows that culture gives no influence in the relationship between tax rate and tax evasion. This indicates that even though the culture is probably different, the impact of changes in tax rates in influencing tax evasion is relatively common in almost all countries. Indifferent effect of tax rate changes across countries due to the characteristic of tax rate as an open policy and the trend of globalization. Different from audit policy that tends to be exclusive and with more restriction to be shared to public, the changes in tax rates are explicitly listed in the formal rule or announced publicly by the government. So, the changes in tax rates are not only known by domestic people, but also by foreigners. Furthermore, in the globalization era, with easiness in capital mobility, increasing tax rate encourages the capital out-flight to lower tax rate countries As a result, wherever the country, tax rate policy induce relatively similar effect. Increasing tax rate will be responded by increasing tax evasion domestically or shifting the investment to other countries that may induce further non-compliant behavior such as illegal transfer pricing, profit shifting or evading tax via tax haven countries. The result of this study related to the role of lowering tax rate in decreasing tax evasion give additional support to prospect theory (Kahneman & Tversky, 1979), Dhami and Al-Nowaihi (2007) and Lewandowski (2017). This result is also in line with Murphy (2016) and Johannesen and Pirttilä (2016).

Similar to audit, the role of imposing penalty to diminish tax evasion is not supported by the result of this study. Theoretically, increasing penalty creates an additional loss for non-compliant taxpayers, hence, their utility decreases. Consequently, they tend to avoid it and hence, tax evasion decreases. However, the effectiveness of increasing penalty in creating deterrence effects can be realized if the losses suffered due to the imposition of sanctions are much greater than the potential gains obtained when the evaded tax is not found by tax authority. The failure of tax fine in combating tax evasion mainly due to the feedback response of imposing penalty. Similar to audit, EUT assumes that taxpayers do not resist or counter when tax authority imposes penalty to them. In fact,

many taxpayers, especially who have sufficient tax knowledge or able to hire tax consultants or lawyers, try to avoid the punishment and have a big opportunity to evade more taxes. The possibility of further response as the main cause of ineffectiveness of penalty is supported by the data of heterogeneity analysis as shown in Table 10. Similar to the role of income level as moderating variable in the relationship between audit and tax evasion, increasing GDP per capita as representation of income level also influence the impact of penalty on tax evasion. Increasing penalty in the countries dominated by upper class citizens tends to get unexpected responses by taxpayers. Instead of becoming more obedient, increased sanctions encourage them to make more sophisticated efforts in order to avoid more severe sanctions. With higher capability, better knowledge of tax law, greater fiscal connection and more experience with tax office, they are able to prepare a more effective strategy to avoid taxes without worrying of being caught or subject to penalties. If detected or caught by tax officer, they also have more resources to fight it in the higher court. So, increasing tax penalty in high-income countries tends to ended with higher level of tax evasion. the result of this study which conclude that tax penalty is not effective tool to reduce tax evasion due to the feedback response of taxpayers is in line with Torgler and Schneider (2007), Varma and Doob (1998) and Devos (2013).

CONCLUSION

In this meta-analysis study, we synthesized totally 478 outcomes results from 86 individual articles published in the period 1978–2018. Our main findings are as follows. First, there is a robust conclusion that decreasing tax rate is a significant tool in combating tax evasion. Conversely, audit and penalty have no significant impact on tax evasion. This suggests that scaring taxpayers by using audit and penalty, especially just based on economic calculations, unable to prevent taxpayers from being involved in tax evasion. Second, culture and income level influence the response of taxpayers that cause the failure of audit and penalty in minimizing tax evasion. This suggests that the success of tax policy is not only determined by tax authority, but mostly influenced by taxpayers' feedback related to the policy.

Our findings should be of interest to tax authorities or other tax policymakers. First, instead of scarifying resources in conducting audit or imposing more penalty, tax authorities should consider to set the tax rate as low as possible to diminish tax evasion. Second, believing that culture influences the relationship between audit and tax evasion, tax authorities should consider cultural values when designing audit. In addition, the difference of income level across countries should also be considered when setting tax policy related to audit policy and penalty structure. Auditing procedures that may work well in developed countries such as in the United States or the United Kingdom may be ended with failure when implementing in developing countries with contrast cultural portrait. Similarly, tax fine using financial penalty may work well in low-income countries, but it may create unexpected impact for taxpayers in high-income countries.

Some limitation of this meta-analysis study should be addressed. First, the current study focuses only on deterrence approach as the main explanatory factor of tax evasion. To establish a more complete picture of tax evasion model, future research should investigate other variables included in non-deterrence approach such as service, trust, personal norms and social norms. Second, this study concentrates on cultural aspect as moderating variables using Hofstede's cultural dimensions. This concept was originally developed in 1980 or 39 years ago, so there is a possibility of being outdated concept due to the globalization and the rapid development of technology. However, beside updated in 2010, several researches (Eringa, Caudron, Rieck, Xie, & Gerhardt, 2015; Merritt, 2000; Minkov, 2018) have examined and concluded that Hofstede's concept is relatively still valid and reliable.

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