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A fairness approach to tax amnesty

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Whether or not tax evaders join tax amnesty programs after evading taxes, an important index is the influence of tax amnesty programs on compliance. To study this question, this paper sheds light on a relatively neglected but important area of the tax amnesty literature in the economic analysis of the secondary tax evasion of tax evaders. Considering that people who participate in tax amnesty program after the government approved an amnesty for tax evasion may not honestly report the whole amounts of evaded tax, thus committing a secondary tax evasion. However, until now our discussions have not been analyzed in any relevant literature. It is shown that even considering the risk of abstaining from tax amnesty program and incurring possible uncertainty of tax evasion penalties, participating in a tax amnesty program provides a higher level of utility for a tax evader. This result reflects the observation that many tax evaders are willing to pay taxes even when expected penalty rate and the probability of being caught evading taxes are extremely low. Also, because secondary tax evasion is often accompanied by tax amnesty, we suggest that during the initial assessment period of the tax amnesty plan, tax revenue drastically increased; when the assessment period ends, tax revenue stably declined and ultimately converged on a fixed value.

Key words: Tax evasion, tax amnesty, concealment cost, secondary tax evasion, puzzle of compliance.

INTRODUCTION

High income earners often transfer their income abroad to avoid high tax liabilities in their countries. To prevent tax base erosion, several countries have implemented tax amnesty programs that provide tax averters the opportunity to actively declare their unreported income from the previous period within a certain period, subsequently paying reduced penalties rather than high tax-evasion penalties. As we know, tax amnesty program is not a new tax but an administrative scheme to collect past taxes and may be a relatively low-priced means by which these tax liabilities can be collected, and governments of all kinds have increasingly turned to tax amnesties as part of their fiscal revenues in recent years. During the past forty years, it can be observed that tax

amnesty programs have been used in many countries in both developed and developing world. For instance, almost all U. S. states have offered tax amnesty programs since 1980, and Spanish Government in 2012 announced a tax amnesty for undeclared assets or those hidden in tax havens, and repatriation would be allowed by paying a 10 percent tax with no criminal penalty to prevent money from flowing out of that state. Shortly afterwards, the Liechtenstein Government in 2014 advocated the idea of a one-off, non-punitive voluntary declaration of non-compliance tax amnesty programs, a program currently enforced in Switzerland to avoid an "accumulation" of amnesties. However, it is worthy of note that many amnesty programs which developing countries have been employed, often repeatedly incessantly, including Chile, Colombia, India, and the Mexico.

In an important early study, Arindam et al. (1995) provide empirical estimates of the revenue impact of Indian income tax amnesties between 1965 and 1993. This study examines the role of amnesties to allow tax evaders to join these programs and honestly pay the taxes that were evaded by past tax evasion. Their empirical results indicate that only the 1975 amnesty appears to have had a positive impact on tax revenue while other amnesties having negligible or even negative effects. Luite and Sobel (2007) suggest that, in general, if at first one country declares an amnesty program, it brings the government a temporary revenue augments during the amnesty period but then brings about a reduction in revenue in the long run. Laborda and Rodrigo (2003) find that amnesties had no effect on tax revenue in either the short or the long term. Yet, Luitel and Mahar (2013) suggest that tax amnesties raise higher tax revenues for the US state treasury in the short term. Also, Fisher et al. (1989) suggest that amnesty seems to generate immediate revenue efficiently.

In the interest of tax evaders, how then can existing literature explain why tax evaders may find it worthwhile to take advantage of tax amnesty programs? Leonard and Zeckhauser (1987) discuss that the argument in favor of tax amnesty programs is some people obtain and no one sacrifices if a tax amnesty is provided. Yet, Olivella (1996) suggests that although governments offer tax amnesty programs, tax evaders may not participate in such programs. As Olivella (1996) noted, tax evaders join tax amnesty programs and honestly pay the taxes that were evaded, they risk incurring stringent inspections by tax authorities on their previous annual incomes because of the increase in reported income; this can hamper future intentions to evade paying taxes. Also, Alm et al. (1990) argue that the expectation of an amnesty significantly reduced compliance; however, these negative impacts on compliance can be offset by greater post-amnesty enforcement efforts.

Other work, Cyert and DeGroot (1987) argue that tax evaders are not well aware of the disutility from tax evasion when they file their tax returns but learn about it well through experience. If they later learn that they would like to be more honest than they have been, an amnesty gives them an opportunity to repay the evaded tax amounts. Besides, Luitel and Tosun's paper (2013) regard joining tax amnesty programs as a Pareto improvement, because it benefits tax evaders without damaging other parties; however, implementing these programs may decrease tax compliance rates among honest taxpayers, violating horizontal equity.

In practice, if tax evaders fail to honestly repay the taxes they evaded after joining tax amnesty programs, when the unreported proportion is subsequently discovered by tax authorities, they must pay penalties equivalent to those paid by the tax evaders who did not join the program when found guilty of tax evasion. Unfortunately, existing theories of tax amnesties have neglected the influence of this condition on expected utility and the income and risk behavior of tax evaders. To fill this gap in the economics literature, this paper considers the influence of tax averters' partial or complete participation in tax amnesty programs (where secondary tax evasion potentially occurs) on their income, expected utility, risk appetite, and choice behaviors. Furthermore, the impact of perceived tax revenue with tax amnesty was also analyzed.

The remainder of the paper is organized as follows. In section 2, we discuss the use of methodology and the conditions that must be fulfilled for government tax amnesty plans to succeed. In section 3 we investigate tax evaders' partial or full participation in tax amnesty plans, tax evaders who participate in the tax amnesty plan but repeat tax evasion, and the effect of participating or not participating in the tax amnesty plan on expected utility and risk-related decisions; investigating the implications for tax amnesty compliance of increased taxpayer income. In section 4 we explore the influence of the government's implementation of the tax amnesty plan on tax revenue during the initial and final assessment periods. The final section offers a brief summary and conclusion.

METHODOLOGY

The methodology of this study is based upon rigorous mathematical economics to represent theories and analyze problems in economic theoretical framework. The methods we employ include differential and integral calculus, separation of variables, mathematical programming, method of moments (MOM), von Neumann-Morgenstern axioms, utility maximization and optimal decision principle, to analyze individual risk preference and government revenue in tax amnesty situation.

We assume that tax evaders and tax authorities exist in societies. Consider the following simple economy. All the individuals in the economy earn the same income, and

are risk neutral, and have the same utility function. Thus, the concept of rationality underlying the metaphor of "homo oeconomicus" is based on the assumption that all the tax evaders maximize their utility in choices and decision-making. In utility models, non expected utility theories such as the subjectively weighted utility, the Allais paradox, the prospect theory, and the rank-dependent expected utility theory have been used to explain that people's decision-making behavior is irrational, contrary to the expected utility hypothesis. In addition, using subjective weights or subjectively weighted utilities to analyze the decision-making behavior of people typically causes the sum of the subjective weights of tax evaders to be greater than 1, which contradicts the economic and rational behavior proposed in the expected utility hypothesis.[1] Therefore, this study used the von Neumann-Morgenstern axioms which satisfy the method of moment (MOM) to analyze the occurrence probability of each type of situation and satisfy the hypothesis that economic activities performed collectively by a society are equalized. The methodology was applied for the secondary evasion research under tax amnesty situation by using theoretical approach and mathematical solution to achieve them. In this case, we find that the representative tax evader reveals decreasing absolute risk aversion (DARA).

Models with optimizing tax amnesty program

Suppose a tax evader makes decisions by envisioning the consequences of his actions and then choosing an action that maximizes his/her expected utility. Regardless of whether tax evasion activities are caught, let a tax evader whose fixed real income, y, is given. Reported income is taxed at the marginal tax rate m. $\mathrm{F}(s)$ be the function of the hidden cost of each dollar evaded, and s be the ratio of the hidden cost of each dollar evaded to the evaded one dollar. The hidden cost of each dollar evaded is expressed as $C(s) = s \times \int \mathrm{d}F(s)$, where $F_s'(s) = f_s(s)$, $s \in [0,1]$, $C(0) = C'(0) = 0$, $C'(s) > 0$, $C''(s) > 0$, and $y^{\sigma} > 0$ denotes the fixed real income of a tax evader while σ is coefficient governing the relationship between changes in income and changes in tax payments. A tax evader faces two conditions: p, the probability of being caught evading taxes; and $(1-p)$,[2] the probability of successful escape, assume p is independent of reported income. Let υ be the proportion of unreported income to fixed real income.

In this case, suppose that τ is the penalty rate that must be paid to the government for each dollar evaded by a tax evader who does not join a tax amnesty program and is found guilty of tax evasion,[3] where $\tau(m) > m$. Also, in line with Torgler and Schaltegger (2005), a second or third tax amnesty does not improve tax compliance. Hence, assume that tax amnesty can only be used once. It is also assumed that, if audited, all of the unreported income of a tax evader will be discovered. If a tax evader joins a tax amnesty program after evading taxes, the amnesty penalty rate of each dollar evaded is χ, $\forall$ $\chi < \tau$.

For a tax evader, the disutility of evading tax is increasing in the fraction of honest taxpayers, where $h \in [0,1]$ denotes the fraction of honest taxpayers in society. The coefficient A measures the degree of disutility that a cheater feels when $100h$ percent of taxpayers report income honestly, where $A \in [0,1]$. In case of evasion, now let the expected rate of return on a dollar of evaded tax $E(r) = (1 - p - \tau \times p) \times m$ be strictly positive (or, $(1-p)/p > \tau$). Under this assumption, the government may eliminate evading tax simply by choosing p and τ so that $E(r) \leq 0$. However, should the government employ p and τ, if it can influence this parameter? This paper accords with the world of experience and adopts Andreoni's (1991) suggestions that it may be rather costly for government to do so. The cost benefit principle reveals that Eq.(1) represents the premise that a tax amnesty program is not joined following tax evasion:

$$(1-p) \times (1 - m \times (1-\upsilon) + m \times \upsilon \times r - A \times h) + p \times (1 - m + \upsilon \times m - \tau \times m \times \upsilon) > 1 + m \times \upsilon \times s \times \int dF(s) \, , \, \forall s, \, \forall \, 0 \leq \upsilon \leq 1$$

(1)

Further, this paper denotes that, when risks are un-identified, tax evaders encounter two choices after evading taxes: (i) participating in tax amnesty programs and paying penalties, or (ii) not joining such program, but risking the probability of being caught versus successful escape.

Let χ be the penalty rate of each dollar evaded by the representative tax evader who joins a tax amnesty program before being caught evading taxes in previous years, and $m < 1 < \chi < \tau$. Let κ be the proportion of back duty payments to actual unreported taxes of a tax evader after joining that tax amnesty program, and $\kappa \in [0,1]$. The value of this proportion is only known to the tax evader who voluntarily repays his/her delinquent taxes. Hence, if a tax evader joins a tax amnesty program, the total amount of evaded taxes due can be expressed as

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[1] Take, for example, prospect theory replaces the probability of the risky occurence with a "weighting function" that underweights high probabilities and overweights low ones. Therefore, prospect theory has failed so far to attract the attention of economists as a valuable tool of analyzing tax amnesties, an exception being Alm and Beck (1990).

[2] $\tau \times p < 1$, denoting that corner solutions are eliminated, and only interior solutions are considered in this model.

[3] Because part of the unreported incomes may be legally exempt incomes, the method of Yitzhaki (1974) was adopted, basing penalties on evaded taxes, rather than basing penalties on evaded incomes as suggested by Allingham-Sandmo (A–S) model (1972).

$\kappa \times y \times m \times \upsilon \times \chi$. This paper stands in contrast with some existing literature. Assume that a tax evader in an amnesty program does not honestly repay the evaded taxes. When the unreported proportion $1-\kappa$ is subsequently discovered by tax authorities, the additional amount of penalties due can be expressed as $(1-\kappa) \times y \times m \times \upsilon \times \tau$.

Given the definition, an effective tax amnesty strategy provided by the government is given by,

Proposition 1. The premise for establishing an effective tax amnesty program is

$$\frac{\varpi^{\circ}}{q_t} < \theta^*$$

Proof: See Appendix 1 for details.

Analysis of the secondary tax evasion under tax amnesty

Let ε be the ex ante probability of a tax evader who joins a tax amnesty program after evading taxes, and $1-\varepsilon$ be the probability of not joining such program, where $\varepsilon(y^{\sigma} \times \upsilon) = \int_{\Omega(y^{\sigma} \times \upsilon)} f(\lambda)\, d\lambda$, $\varepsilon \in [0,1]$. Assume that real income is subject to some stochastic shock, λ, the shock is supposed to be a stochastic variable with probability distribution function $f(\lambda)$, $\lambda \in (-\infty, \infty)$. To see this, this paper quotes Andreoni (1991) definition to resolve this exogenous variable, ε. Consider a tax evader initially underreports $y^{\sigma} \times \upsilon$, assume that he/she knows $f(\lambda)$ but not realize λ. After experiencing λ a tax evader is given an opportunity for the amnesty program.   Let $\Phi(y^{\sigma} \times \upsilon; \lambda; s) = U(y^e) - U(y^c) - y^{\sigma} \times m \times \upsilon \times s \times \int dF(s)$ be the ex post net utility gain from participating a tax amnesty. Then a tax evader will take the tax amnesty if and only if $\Phi \geq 0$. In spite of λ is exogenous, a tax evader has some control over Φ through his/her picking of $y^{\sigma} \times \upsilon$. Therefore, define the set function $\Omega(y^{\sigma} \times \upsilon) = \left\{ \lambda : \Phi(y^{\sigma} \times \upsilon; \lambda; s) \geq 0 \right\}$. Given U(•) is a von Neumann-Morgenstern cardinal utility function (1944), then if $\lambda \in \Omega(y^{\sigma} \times \upsilon)$, a tax evader will take the amnesty. In this scenario, according to Proposition 1, when $\frac{\varpi^{\circ}}{q_t} < \theta^*$, that is, $\theta^A \leq \theta_{t-1} = \theta^*$, $\kappa \notin \left[-\infty, \theta^A\right], \forall \varepsilon, 0 < \varepsilon \leq 1$, then a tax averter joins a tax amnesty program.

Thus, as defined by this paper, a tax evader with a differentiable von Neumann-Morgenstern cardinal utility function will make a choice after evading taxes: (1) participating in tax amnesty programs and paying penalties, or (2) not joining such program, but risking the probability of being caught versus successful escape, then, the expected utility of a tax evader can be expressed as :

$$\hat{Eu}(y^{\sigma}) \equiv (1-\varepsilon) \times U(y^c) + \varepsilon \times U(y^e) - y^{\sigma} \times m \times \upsilon \times s \times \int dF(s), \quad \forall \varepsilon \ . \tag{2}$$

Assume that in Eq. (2),

$$y^c = (1-p) \times (1-m \times (1-\upsilon) + \upsilon \times m \times r - A \times h) \times y^{\sigma} + p \times (1-m+\upsilon \times m - \tau \times m \times \upsilon) \times y^{\sigma}$$

, and $y^e = y^{\sigma} \times \left[1 - \chi \times m \times \upsilon \times \kappa - m \times \upsilon \times \tau \times (1-\kappa)\right]$, where y^c is the expected revenue for a tax evader not joining tax amnesty programs, and y^e the expected revenue for a tax evader joining such programs. Therefore, the joint probability density function can be expressed as,

$$f_{y^e}(y^e) = \frac{d}{dy^e} \int_0^{\infty} \left\{ \int_0^1 f_{y^e, \varepsilon}(y^e, \varepsilon') d\varepsilon' \right\} dy^e = \int_0^1 f_{y^e, \varepsilon}(y^e, \varepsilon') d\varepsilon',$$

and as a taxpayer decides to evade taxes. As mentioned earlier, let υ be the proportion of hidden incomes to actual incomes (i.e., the rate of tax erosion). Then, the Hamiltonian first-order optimal control condition of υ for the expected utility of tax evasion implies:

$$H = \left[(1-\varepsilon) \times p \times y^{\sigma} \times m \times (\tau-1) - (1-\varepsilon) \times (1-p) \times m \times (1+r) \times y^{\sigma}\right] \times U'(y^c) + \left[\varepsilon \times y^{\sigma} \times \chi \times m \times \kappa + \varepsilon \times y^{\sigma} \times m \times \tau \times (1-\kappa)\right] \times U'(y^e) + y^{\sigma} \times m \times s \times \int dF(s) = 0, \tag{3}$$

The requirement for internal solution is $\tau < \frac{(1-p) \times (1+r) + p}{p}$,

$\forall \varepsilon$.

Eq. (4) indicates that the second order condition of υ for the expected utility is $H_{\upsilon} < 0$, or, $\partial^2 H / \partial \upsilon^2 < 0$. This reveals that the function of the utility of tax evasion is strictly concave, $U''(\cdot) < 0$, and therefore, the representative tax evader is a risk averter.[4]

$$H_{\upsilon} = (1-\varepsilon) \times \left[p \times y^{\sigma} \times m \times (\tau-1) - (1-p) \times m \times (1+r) \times y^{\sigma}\right]^2 \times U''(y^c) + \varepsilon \times \left[y^{\sigma} \times \chi \times m \times \kappa + y^{\sigma} \times m \times \tau \times (1-\kappa)\right]^2 \times U''(y^e), \tag{4}$$

As mentioned earlier, κ be the proportion of back duty payments to actual unreported taxes of a tax evader after joining that tax amnesty program. Using Eq. (3), it is simple to show that the influence of κ on the second

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[4] The second order condition for the expected utility of tax aversion, $H_{\upsilon} < 0$ and $H_{\kappa} < 0$, indicates that for either the initial or secondary tax evasion after joining a tax amnesty program, large amounts of hidden income increase the risk aversion of a tax evader.

order condition H_κ for the expected utility of tax evasion is:

$$H_\kappa = \varepsilon \times y^\sigma \times m \times (\chi - \tau) \times U^{'}(y^e) + \left[\varepsilon \times y^\sigma \times \chi \times m \times \kappa + \varepsilon \times y^\sigma \times m \times \tau \times (1-\kappa)\right] \times m \times \upsilon \times y^\sigma \times (\tau - \chi) \times U^{''}(y^e)$$ (5)

Eq.(5) clearly demonstrates that the function of κ (i.e., the proportion of back duty payments) to the second order condition for the expected utility of tax evasion is strictly concave (i.e., $H_\kappa < 0$). A similar result is available for κ from Eq.(5), that even the representative tax evader who participates in a tax amnesty program may not honestly report the whole amounts of evaded tax, thus committing a secondary tax evasion; nevertheless, the tax evader is strictly risk averse.

Proposition 2. In the circumstances of partial or complete participation in a tax amnesty program, when the penalty rate is based on the evaded taxes, the second order condition of the hidden-to-actual income proportion, υ, for the expected utility of tax evasion is $H_\upsilon < 0$, or, $\dfrac{\partial^2 H}{\partial \upsilon \times \partial \upsilon} < 0$, and the second order condition of the proportion tax duty payments to actual reported taxes for the expected utility of tax evasion is $H_K < 0$, or, $\dfrac{\partial^2 H}{\partial \upsilon \times \partial \kappa} < 0$, confirming the assumption that Hamiltonian is a strictly concave function for both υ and κ, and that tax evaders are risk averters.

Moreover, this paper turns to a central question thus presented concerns the choice to be made between participating in a tax amnesty programs after evading taxes or abstaining from tax amnesty program and incurring possible uncertainty of tax evasion penalties. To analyze this question, this section derives the preference implications of the sign of $U^{''}$ and $U^{'''}$ by providing a practical theorem for experimental investigations about the influence of tax amnesty on the risk of decision-making for tax evaders.

Let the original properties of a tax averter be B, where $B \geq 0$, and the definitions of y^c and y^e be identical to those in Eq. (2). Consider people who participated in tax amnesty programs after the government proposed an amnesty may not honestly report the whole amounts of evaded tax, thus committing a secondary tax evasion, the expected utility function is

$$(1-\varepsilon) \times U(B + y^c) + \varepsilon \times U(B + y^e) - y^\sigma \times m \times \upsilon \times s \times \int dF(s)$$ (6)

Clearly, the indifference curve of tax evasion in the bidimensional space of the probability of $y^c - y^e$; thus, it can be expressed as:

$$(1-\varepsilon) \times U(B + y^c) + \varepsilon \times U(B + y^e) - y^\sigma \times m \times \upsilon \times s \times \int dF(s) \equiv U(W)$$ (7)

Based on the implicit function theorem, define the relationship of y^c and y^e as $y^e(y^c)$, in which Eq. (7) passes through (0, 0). A total differentiation of both sides of Eq. (7) generates the following:

$$(1-\varepsilon) \times U^{'}(B + y^c) + \varepsilon \times U^{'}(B + y^e) \times y^{e^{'}}(y^c) = 0,$$ (8)

Differentiating Eq. (8) generates the following:

$$(1-\varepsilon) \times U^{''}(B + y^c) + \varepsilon \times \left[U^{''}(B + y^e) \times \left\{y^{e^{'}}(y^c)\right\}^2 + U^{'}(B + y^e) \times y^{e^{''}}(y^c)\right] = 0,$$ (9)

(Substituting $y^c = y^e = 0$ into Eq. (8) generates $y^{e^{'}}(0) = -(1-\varepsilon)/\varepsilon$. Substituting $y^c = y^e = 0$ into Eq. (9) generates

$$(1-\varepsilon) \times U^{''}(B) + \varepsilon \times \left\{U^{''}(B) \times \frac{(1-\varepsilon)^2}{\varepsilon^2} + U^{'}(B) \times y^{e^{''}}(0)\right\} = 0,$$

which can be rearranged to form the following proposition:

$$y^{e^{''}}(0) = \frac{(1-\varepsilon)}{\varepsilon^2} \times \left[\frac{-d \ln U^{'}(B)}{dB}\right],$$ (10)

Proposition 3. If a tax evader' cardinal utility function is $U^{''}(B) < 0$, then $y^{e^{''}}(0) > 0$. The definition of Eq. (10) indicates that a greater Arrow-Pratt index of absolute risk aversion generates a greater curvature of the indifference curve near (0, 0) in the bidimensional space of y^c / y^e, Therefore, let π_w be the risk premium. If "tax amnesty" is normal good, and $\pi_w(y^e) \geq \pi_w(y^c)$, then the corresponding gamble set size of joining tax amnesty programs, $\pi_w(y^e)$, is smaller than that of not joining such programs.

Under such conditions, joining tax amnesty programs is more profitable than not joining such tax amnesty programs. Figure 1 illustrates the representative tax evader's response to the tax amnesty program, after considering the representative tax evader who participates in a tax amnesty program, may not honestly report the whole amounts of evaded tax, thus committing a secondary tax evasion. Moreover, this is a theoretical result which appears to be relatively robust; participating in tax amnesty programs yields relatively high levels of
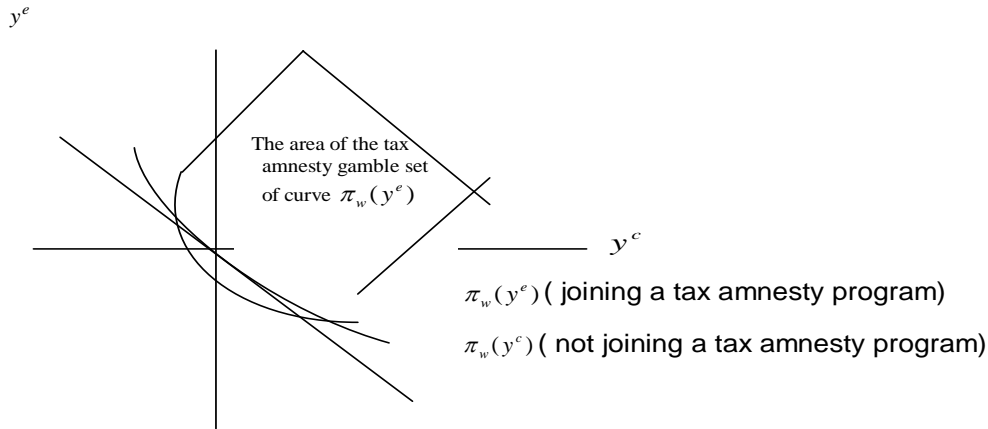
y^e

The area of the tax amnesty gamble set of curve $\pi_w(y^e)$

y^c

$\pi_w(y^e)$ (joining a tax amnesty program)

$\pi_w(y^c)$ (not joining a tax amnesty program)

Figure 1. The gamble set of joining or not joining tax amnesty programs.

utility, and is advantageous to tax averters.

In addition, based on Eqs. (7) and (10), defining $U^{'''}(B)$ is continuous on $[B, W]$ with $0 \leq B < W$, and π_w, as defined above, denotes the risk premium. Intuitively, it implies that,

$$U^{'''}(W) > U^{'''}(B) \qquad \forall W , \forall B \qquad (11)$$

As mentioned previously, let y^e and y^c be two risk prospects on tax amnesty programs, which satisfy the method of moment(MOM), express expected utility and also satisfy $E(y^e)^k = E(y^c)^k$ for all k except k = 3. The condition here is

$$
\begin{aligned}
&EU(B + \pi_w(y^e)) - EU(B + \pi_w(y^c)) \\
&= \frac{1}{6} \times \left\langle E[\pi_w(y^e) - \pi_w((1-\varepsilon) \times y^c - \varepsilon \times y^e)]^3 - E[\pi_w(y^c) - \pi_w((1-\varepsilon) \times y^c - \varepsilon \times y^e)]^3 \right\rangle \times \\
&\quad U^{'''} \left\langle B + \pi_w((1-\varepsilon) \times y^c + \varepsilon \times y^e) \right\rangle
\end{aligned}
$$

$$(12)$$

As is clear from Eq. (12), an important implication of Eq. (12) implies that the sign of $U^{'''}$ determines preference between y^e and y^c .[5]

Thus, if an amnesty is offered, the relationship between W and π is given by,

$$\frac{d\pi_w}{dW} = \frac{U^{'}(y^e) - U^{'}(y^c)}{U^{'}(y^e)} < 0 \quad \forall y^e , \forall y^c \qquad (13)$$

It is known from Eq. (13) that, under the prevalence of tax amnesty, the greater the income, the lower the tax compliance.

In this case, the representative tax evader reveals decreasing absolute risk aversion (DARA). Thus, an increase in income leads to a decrease in tax compliance. This expression seeks to supplement, but not supplant the Arrow (1970) theory of risk aversion (Figure 1).

Effect of government implementation of tax amnesty on tax revenue

Finally, the analysis could be extended to examine the effect of tax amnesty on tax revenue. Stella (1991) indicated that receipt of additional tax revenue is typically unlikely to occur in the short-run. But tax amnesty plans may reduce the willingness of taxpayers to voluntarily file taxes. Such plans may result in the long-term erosion of a country's tax base. However, contrary to Stella's assertion, this study determined that this statement may not be true in practice. According to actual analyses of the various state-level tax amnesty plans recently implemented in the United States, almost all of the states experienced a short-term increase in fiscal revenue because tax evaders paid overdue taxes or negotiated fines. For example, the state government of Connecticut experienced an increase in tax revenue of approximately US$175–180 million after the tax amnesty plan was implemented in 2013. Other examples of increases in tax revenue after the implementation of tax amnesty plans are listed as follows by state, year, and amount of tax revenue: New Jersey, 2009, US$661 million; Louisiana, 2009, US$439 million; Nebraska, 2013, US$8.98 million; Florida, 2010, US$160 million (this tax amnesty plan lasted 90 d); and California, 2005, US$683 million.[6] These results differed from the argument proposed by Stella (1991). In other words, based on the tax amnesty plan situations experienced by the various U.S. states,

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[5] Suppose the government plans to offer an amnesty, it can be shown from (12) that $U^{'''} > 0$ denotes "tax amnesty" is normal good.

[6]Information obtained from the following website: http://www.governing.com/columns/assessments/gov-tax-now-pay-later.html

tax amnesty should exhibit a positive effect on tax revenue for governments.

Case 1: The expected tax revenue without implementing the tax amnesty

To examine the effect of tax amnesty on tax revenue, Andreoni (1991) argued that tax revenue increase as a result of tax amnesty plans influenced by the amount of taxes evaded by tax evaders before their participation in the tax amnesty plans. However, Andreoni ignored the effect of assessment period on tax amnesty and tax revenue. Therefore, in this section, the general settings employed by previous literature were used to examine the influence of tax amnesty plans and assessment period on tax revenue. Suppose that the assessment period in which the government implemented a tax amnesty plan was defined as J; R^e, which was an exogenous variable, signified the estimated total tax revenue during the assessment period after implementation of a tax amnesty plan; the estimated total tax revenue without implementing the tax amnesty plan was defined as S^e; $0 < t < T$ marked the period in which the tax amnesty plan was implemented; T was the last day of the assessment period; and λ and μ were the indicator variables of the indicator function that displayed the relationship between time and tax revenue. The expected tax revenue without implementing the tax amnesty plan S^e changed as time t changed. The exponential function to define this relationship is as follows:

$$S^e(t) = e^{-\lambda t + \mu} \tag{14}$$

Eq. (14) shows the changes in the relationship between time and tax revenue for the various assessment periods when no tax amnesty plan was implemented by the government.
Eq. (15) was the differential equation for the tax revenue collected.

$$\frac{dS^e}{dt} = -\lambda \times S^e \tag{15}$$

Eq.(15) shows that tax revenue received by the government gradually declines as the assessment period reaches the final period in the absence of any tax amnesty scheme.

Case 2: Effect of government implementation of tax amnesty on tax revenue

Assuming that a certain percentage of tax evaders, γ,

would participate in the tax amnesty plan during the assessment period, the changes in tax revenue over time would be directly proportional to Eq. (16)

$$\gamma \times J \times \frac{R^e - S^e}{R^e} \tag{16}$$

This study demonstrated that during the initial assessment period of the tax amnesty plan, tax revenue drastically increased. However, as the assessment period gradually approached the final day of the assessment period, tax revenue stably declined and ultimately converged on a fixed value. Proposition 4 was thus formulated:

Proposition 4: During the initial period in which the government implements a tax amnesty plan, tax revenue drastically increases; however, as the assessment period ends, the probability that tax payers are exempt from fines and successfully evade taxes increases. Therefore, tax revenue received by the government gradually declines as the assessment period reaches the final period, and tax revenue converges on a fixed value.

Proof: See Appendix 2 for details.

The result of our analysis is in line with Stephan et al.(2012), who evidenced that tax compliance was higher if the uncertainty whether one's tax return would be audited was not resolved until the "assessment period "ended. As mentioned above, the current literatures and empirical evidences are so little to explain the long-term revenue effects of states's tax amnesty programs/ thus committing a secondary tax evasion. Empirical evidence may not be the primary objective of this study mainly.This paper takes a different approach to set up theoretical models and capture these effects. Our finding is also in line with some tax amnesty plans recently implemented in the United States which reveal that all the states's first amnesty plan brings an immediate revenue boost. Furthermore, as can be seen in Luitel et al. (2007)'s article, tax amnesty has a declining marginal benefit to the state, which is also in line with the models we employ. Hence, we see these empirical evidences reinforce the results obtained in our mathematical solutions.

In this section, we summarize that tax amnesty program brings immediate and short-run impact, but we also have doubts about the long-run revenue impact of a tax amnesty. In this study, we show that by breaking horizontal equity, tax amnesties might be perceived as unfair, but governors perceive tax amnesties as another short-run revenue source rather than a tax increase alternative.

DISCUSSION AND CONCLUSION

Theories proposed in previous literature may not have

been based on practical economic and social situations. In this study, the possibility that tax evaders engaged in repeated tax evasion after participating in the tax amnesty plan was included as part of the model to avoid oversimplification of the model assumption. This article contributes to the literature on tax amnesties in six ways: First, the influence of erosion rate of tax base due to tax evader's option to tax amnesty plan on the second order condition of the subjective expected utility of tax evaders is characterized by a strictly concave function; second, the influence of the proportion of back duty payments (recovered from tax evaders who voluntarily paid the negotiated fines and overdue taxes not discovered during previous periods) on the second-order condition of the subjectively expected utility of tax evaders exhibited strictly concave function; third, by incorporating the amount of money originally possessed by tax evaders, this study demonstrated that compared with tax evaders who did not participate in the tax amnesty plan, those who participated exhibited higher differentiable von Neumann-Morgenstern cardinal utility function . In other words, it shows that, provided there are no changes in penalty rate, and thus the probability of being caught evading taxes, even if tax evaders who participated in tax amnesty programs may not honestly report the whole amounts of evaded tax, thus committing a secondary tax evasion. Nonetheless, this result unambiguously reveals the tax evaders who participated in tax amnesty programs yield relatively high levels of von Neumann-Morgenstern cardinal utility, and it is always beneficial to tax evaders.

Four, the results of this study support the puzzle of compliance philosophy proposed by Diego and Luca (2011), demonstrating the reason that tax evaders are willing to participate in tax amnesty plans despite the probability of the exogenous variables "penalty rate" and "probability of tax evasion activities g discovered" being low; five, the willingness of tax evaders to actively participate in tax amnesty plans after tax evasion decreases as the income or wealth of the tax evaders increases, indicating that the tax evaders' utility function features decreased absolute risk aversion (a robust assumption) and that risk assets subject to tax amnesty were normal goods (i.e., the elasticity obtained from the absolute risk aversion function was greater than the robust assumption of zero); and, six, during the initial assessment period of the tax amnesty plan, tax revenue drastically increased. However, because tax payers are exempted from fines and not required to pay overdue taxes when the assessment period ends, tax revenue stably declined and ultimately converged on a fixed value.

This result may stand in contrast with some existing literature as mentioned previously, but in accord with the world of experience which reflects the observation that many tax evaders are willing to pay taxes even when expected penalties and the probability of being caught evading taxes are extremely low. Note that, this paper

seeks to supplement, but not supplant the traditional considerations of tax amnesty theories. As a result, it may thereby lead to an interesting disclosure that there is no tax amnesty compliance to solve.

Appendix 1.

In Proposition 1, consider risk-neutral agent and the objective of a tax evader who has not been found guilty of tax evasion prior to the current period is to pursue the minimal individual cost of joining a tax amnesty program. Let q_t be the probability of being caught evading taxes in period t; the cost of a tax evader can be expressed as,

$$\Delta C = \underset{\kappa \in [0,1]}{Min} \left[m \times \chi \times \kappa + q_t \times \theta \times (1-\kappa) \times m \times \tau \right] \times y \times \upsilon$$

(A.1.1)

where θ denotes the probability of being caught hiding incomes through any type of government inspection. Adopt κ, the proportion of back duty payments of a tax evader who joins a tax amnesty program, to determine the first-order optimal control condition of the aforementioned equation: $\theta^A = \frac{\chi}{\tau \times q_t}$; the optimal strategy for a tax evader regarding joining a tax amnesty program can be expressed as [7]

$$\kappa^* = \begin{matrix} 0 & \text{if} & \theta < \theta^A \\ [0,1] & \text{if} & \theta = \theta^A \\ 1 & \text{if} & \theta > \theta^A \end{matrix}$$

(A.1.2)

This deduction proves that only evader who meets the condition of $\theta^A < \theta$ chooses to join a tax amnesty program. A tax evader in the condition of $\theta^A > \theta_{t-1} = \theta^*$, $\theta \in [0, \theta^A]$ does not join such program. The number of tax evaders who have not been caught committing tax evasion before the current period (t) can be expressed using the probability density function $(1-q^*) \times \hat{\theta}$. Thus, $(1-q^*) \times \hat{\theta} = \min \left\{ \theta^*; \frac{\varpi^{\circ}}{q_t} \right\}$, where $\varpi^{\circ} = \frac{\chi}{\tau}$ and ϖ° denotes the ratio of χ (the amnesty penalty rate of each dollar evaded) to τ (the penalty rate, which is greater than the marginal tax rate m) that must be paid by a tax evader who did not join a tax amnesty program and is subsequently discovered by

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[7] If tax penalties are based on the evaded incomes of a tax averter, then

$$\Delta C = \underset{\kappa \in [0,1]}{Min} \left[\beta \times \sigma + q_t \times \theta \times (1-\sigma) \times \tau \right] \times y \times \upsilon, \ \theta^A = \frac{\chi}{\tau \times q_t}$$

tax authorities. Therefore, the premise for an amnesty program to be effective is $\frac{\varpi^{\circ}}{q_t} < \theta^*$.

Appendix 2.

Based on (15) and (16), the differential equation was expressed as (A.2.1):

$$\frac{dS^e}{dt} = -\lambda \times S^e + \gamma \times J \times \frac{R^e - S^e}{R^e} \qquad (A.2.1)$$

Further computations produced a non-homogeneous equation:

$$\frac{dS^e}{dt} = -\left(\lambda + \gamma \times \frac{J}{R^e}\right) \times S^e + J \times \gamma \qquad (A.2.2)$$

The homogeneous equation corresponding to the non-homogeneous equation, (A.2.2), is as follows:

$$\frac{dS^e}{dt} = -\left(\lambda + \gamma \times \frac{J}{R^e}\right) \times S^e \qquad (A.2.3)$$

Using the separation of variables method, the following equation was obtained:

$$\int \frac{dS^e}{S^e} = -\left(\lambda + \gamma \times \frac{J}{R^e}\right) \times \int dt \qquad (A.2.4)$$

By using the integrals from both sides of the equation, the following equation was formulated:

$$ln\left|S^e\right| = -\left(\lambda + \gamma \times \frac{J}{R^e}\right) \times t + C$$

Solving this equation produced the result

$$S^e = \pm e^{-\left(\lambda + \gamma \times \frac{J}{R^e}\right) \times t + C}$$

By setting the constant $C = \pm e^C$ and substituting this constant into the aforementioned equation, the general solution for the homogeneous equation (A.2.3) was obtained:

$$S^e = c \times e^{-\left(\lambda + \gamma \times \frac{J}{R^e}\right) \times t} \qquad (A.2.5)$$

The general solution (A.2.5.) of the homogeneous equation was modified and the constant C was changed to the constant for time $c(t)$ to satisfy the non-

homogeneous equation (A.2.2.) and obtain the hypothetical solution for the non-homogeneous equation:

$$S^e(t) = c(t) \times e^{-\left(\lambda + \gamma \times \frac{J}{R^e}\right) \times t} \qquad (A.2.6)$$

Because the solution of (A.2.6) must satisfy the differential equation (A.2.2), the aforementioned equation was substituted into the equation and the derivative was calculated to produce the following equation:

$$\frac{dc(t)}{dt} \times e^{-\left(\lambda + \gamma \times \frac{J}{R^e}\right) \times t} + c(t) \times \left[-\left(\lambda + \gamma \times \frac{J}{R^e}\right) \times e^{-\left(\lambda + \gamma \times \frac{J}{R^e}\right) \times t}\right] \quad (A.2.7)$$

$$= -\left(\lambda + \gamma \times \frac{J}{R^e}\right) \times c(t) \times e^{-\left(\lambda + \gamma \times \frac{J}{R^e}\right) \times t} + \gamma \times J$$

The following equation was derived by rearranging the equations:

$$\frac{dc(t)}{dt} = \gamma \times J \times e^{-\left(\lambda + \gamma \times \frac{J}{R^e}\right) \times t}$$

By setting $\beta = \lambda + \gamma \times \frac{J}{R^e}$ and calculating the integral, the following equation was obtained:

$$c(t) = \gamma \times J \times \int e^{\beta t} dt = \gamma \times J \times \frac{e^{\beta t}}{\beta} + c' \qquad (A.2.8)$$

Therefore, the general solution for the non-homogeneous equation was expressed as follows:

$$S^e(t) = \left(\gamma \times J \times \frac{e^{\beta t}}{\beta} + c'\right) \times e^{-\beta t} = \frac{\gamma \times J}{\beta} + c' \times e^{-\beta t} \qquad (A.2.9)$$

The initial value of the actual tax revenue was set as $S(0) = S_0$ and substituted into (A.2.9) to produce the following result:

$$S(0) = S_0 = \frac{\gamma \times J}{\beta} + c' \times e^{-\beta \times 0}$$

$$\therefore c' = S_0 - \frac{\gamma \times J}{\beta}$$

Therefore, the expected cumulative tax revenue for assessment period $0 < t < T$ was as follows:

$$S^e(t) = \frac{\gamma \times J}{\beta} + \left(S_0 - \frac{\gamma \times J}{\beta}\right) \times e^{-\beta t} \qquad (A.2.10)$$

(A.2.10) indicates that during the initial assessment period of the tax amnesty plan, tax revenue drastically

increases. However, as the final day of the assessment period approaches, tax revenue will stably decline and ultimately converge on a fixed value.

Conflict of Interests

The authors have not declared any conflict of interests.

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Full Length Research Paper

Determinants of gift tax compliance among employees of the formal sector in Kumasi Metropolis, Ghana

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The study examined the awareness and level of compliance with gift tax by formal sector employees in Kumasi Metropolis Ghana. Two hundred and fifty-two respondents were sampled for the study using the purposive sampling method. Questionnaire was used to solicit data and information from the respondents. Data collected were analyzed using descriptive statistics and probit regression model. The results of the study revealed that the level of compliance with the gift tax is very low. The key reason identified in the study for the low level of compliance with gift tax among Ghanaian taxpayers is unawareness of gift tax obligations. The probit regression result revealed that level of education, knowledge of tax law, and penalty for non- compliance significantly influence respondents' decision to comply with the gift tax law .Hence, the low level of education offered by the Ghana Revenue Authority on the gift tax and non-enforcement of the law have contributed to the low level of compliance. The study therefore recommends that the Ghana Revenue Authority should step up education on the gift tax law and enforce penalty for non- compliance to improve revenue from gift tax.

Key words: Gift tax, tax compliance, Kumasi Metropolis, Tax payers, Ghana.

INTRODUCTION

Since taxation is a compulsory levy on individuals, entities and property by a tax authority (the government of a tax jurisdiction) for the purposes of supporting its expenditure (Sally, 1999; Nakyea, 2008; Alabede, 2014; Bruce-Twum, 2014), incomes and/or gifts are usually the subject matter of taxation. Incomes are usually paid openly and directly to the beneficiaries (that is the person earning the income) and are, most of the time, documented. Hence, they are easily identified and assessed for tax. However, that is not the case of gifts

received or receivable. According to Part V- Interpretation Section 110 (1) of the Internal Revenue Act, 2000 (Act 592 as amended), a gift is a receipt without consideration or inadequate consideration. In other words, a gift is something one receives without adequate compensation paid to the giver by the receiver. Further, Section 105(1) of the Internal Revenue Act, 2000 (Act 592 as amended) provides that a gift, which is taxable under the Act, shall be taxed at the specified rate on the total value of taxable gifts received by a person within a year of assessment.

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Although the tax laws of Ghana, specifically Internal Revenue Act, 2000 (Act 592 as amended), provides for this, in practice compliance is almost non-existence (Terkper, 2003; Gatsi and Acquah, 2010 and Bruce-Twum, 2014). Interestingly, this observation was also made by Tusubira and Nkote (2013) in Uganda, suggesting that non-compliance is a problem (Andreoni et al., 1998) in taxation systems in other parts of the world (Abdul-Razak and Adafula, 2013). To the researcher, compliance with gift tax is both statutory and a civic obligation. Accordingly, non-compliance may result in liability. The purpose of this paper therefore is to educate the public on the provisions of the tax law relating to gift tax and the responsibilities of the taxpayers or the citizenry of Ghana to abide by the law, whilst recommending ways of improving the collection rate. As observed by Gatsi and Acquah (2010), Bruce-Twum (2014) and others around the world, notably McKerchar and Evans (2009), Tusubira and Nkote (2013) and Alabede (2014), lack of knowledge of tax law and its provisions account for the non-compliance with tax among tax payers. Currently, the level of compliance is almost non-existing; meanwhile it is perceived that people do receive gifts almost on daily basis ranging from cash gifts, hampers, cars and other tangible assets.

The aim of the study is to assess the level of gift tax provisions compliance among formal sector employees in Kumasi Metropolis.

REVIEW OF RELEVANT LITERATURE

Since tax revenue has been accepted as the most important source of revenue for governments (Sally, 1999; Nakyea, 2008; Martina et al., 2008; Brautigam, 2008; McKerchar and Evans, 2009; Abdul-Razak and Adafula, 2013; Bruce-Twum, 2014), every effort should be made to assist the government, not only to maintain the level of tax revenue, but also to create voluntary compliance among taxpayers or citizenry of a country like Ghana. To the researcher, this is very important in the advent of the current financial situation facing developing nations after the financial crunch from the western world leading to massive reductions in donations and grants emanating from the developed world to the developing world, mostly Africa, for which Ghana is not an exception (OECD, 2014). Many scholars and analysts assert that for Ghana to have adequate financial resources to finance its developmental programs and agenda (Moss and Majerowicz, 2012), it needs to properly develop its taxation systems in order to rake in more tax revenue (Nakyea, 2008; Martina et al., 2008; Brautigam, 2008; McKerchar and Evans, 2009; Gatsi and Acquah, 2010; Abdul- Razak and Adafula, 2013). This accounts for the recent moves by the government of the day to introduce new taxes to raise tax revenues for development projects and financing of recurrent budget items. In assessing a taxpayer's tax liability, incomes are usually and easily identified and assessed for tax even if the taxpayer attempts not to disclose it (Dressler, 2002; Akhand, 2012). This may be partly because income is mostly paid by one party to the other leaving a trail; also, it is paid in the open directly to the beneficiary (that is the person earning the income); in addition, most of the time, the income received is usually documented.

Gifts of a certain nature are the subject matter of tax laws of Ghana specifically Internal Revenue Act, 2000 (Act 592) as amended. According to Part V-interpretation Section 110 (1) of Act 592 (amended), a gift is a receipt without consideration or inadequate consideration. Section 105(1) of the Act, Act 592 (as amended) further provides that, a gift which is taxable under the Act, shall be taxed at the specified rate on the total value of the taxable gifts so received by a person within a year of assessment. Section 106 of the Act, (Act 592 as amended) defines "taxable gift" to mean,

(a)   Any of the following assets situated in Ghana:

  i.   Building of a permanent or temporary nature;
  ii.   Land;
  iii.   Shares, bonds and other securities;
  iv.   Money, including foreign currency;
  v.   Business and business assets;
  vi.   Any means of transportation (that is, by land, air or sea);
  vii.   Goods or chattels not included in the means of transportation; and
  viii.   Part of, or any right to or interest in any of the assets referred to above

(b) An asset or a benefit, whether situated in Ghana or outside Ghana, received by or for the benefit of a resident person as a gift where the asset has been or is credited in an account or has been or is invested, accumulated, capitalized or otherwise dealt with in the name of or on behalf of or at the direction of the person
(c) A favour in money or money's worth or a consideration for an act or omission or the forbearance of an act or omission that inures for or to the benefit of a resident person.

It is worthy of note that it is immaterial whether or not the person being taxed physically received the asset, so long as the act, omission or transaction is inured to the benefit of that person (Internal Revenue (Amendment) Act, 2003 (Act 644).

The provision of the tax law in respect of gift is, however, liberal requesting voluntary compliance from the taxpayer. Thus, the law provides that under procedure relating to gift tax (S.108) a person who receives a taxable gift shall, within thirty (30) days of receipt, furnish the Commissioner General of Ghana Revenue Authority with a return in writing containing the following information:

1.   the description and location of the taxable gift;
2.   the total value of the gift, how it is calculated and tax payable with respect to that gift;
3.   the full name and address of the donor of the gift; and
4.   any other information required by the Commissioner.

A skimpy and sketchy opinion is that in Ghana, although people do receive gifts on a daily basis ranging from cash (Gatsi and Acquah, 2010; Bruce-Twum, 2014) in the form of local and foreign currency to landed property as well as means of transportation to mention but few, they do not honour their gift tax obligation thereon (Bruce-Twum, 2014). Consequentially, in compliance with the provisions of the tax law, especially in respect of gifts, these should be subject to taxation. It is, however, worthy to mention that it is not every gift received that are taxable. Under section 105(2) gifts received by a person under or for the following reasons are exempt from tax:

1.   by a person under a will or upon intestacy;
2.   by a person from that person's spouse, child, parent, brother, sister, aunt, uncle, nephew or niece;
3.   by a religious body which uses the gift received for the benefit of the public or a section of the public; or
4.   for charitable or educational purposes.

In assessing the value of the gifts subject to tax, the market value of the gift received or receivable is usually used.

The few empirical studies on gift tax in Ghana attempted to provide some answers to the above questions as follows: Gatsi and Acquah (2010), in their study on information asymmetry and gift tax, concluded that gift tax is one of the conduits through which tax revenue can be enhanced for development with a call on Ghana Revenue Authority for better education on the tax. Later, Bruce-Twum (2014) tried to determine the extent of knowledge about gift tax especially in the Accra-Tema metropolis and reached the conclusion that the level of awareness is very low, resulting in non-compliance with gift tax in Ghana. Empirically, there were a series of research studies on taxation and tax compliance in general; for example: enhancing voluntary tax compliance by reducing compliance costs (Jenkins and Forlemu, 1993); tax compliance costs for the SMEs business sector (Evans et al., 2013); investigating tax compliance (Myles et al., 2013); and social norms and tax compliance (Onu and Oats, 2014), all undertaken in advanced economies. In addition to the above, there have been studies undertaken on making large corporations tax compliance in other developing economies like Bangladesh (Akhand, 2012); and income tax compliance among SMEs in Uganda (Tusubira and Nkote, 2013). In Ghana, income tax non-compliance among Ghanaian self employed (Baba and Asante, 2012), and taxpayers'

attitude and its influence on tax compliance decisions (Abdul-Razak and Adafula, 2013) are some of the available compliance studies; however they failed to estimate the level of non-compliance. Although some levels of research works have been done on gift tax compliance, notably Gatsi and Acquah's (2010) study 'Information Asymmetry and Gift Tax in Ghana' and Bruce-Twum's (2014) 'Gift Tax Compliance in Ghana, an Empirical Study', the researchers, in determining the level of awareness and/ or compliance with gift tax, did not use a very large sample size. For example, Bruce-Twum (2014) only used one hundred and sixty-seven respondents in his analysis. Further, it was found from the literature review that most studies undertaken in the area of tax in Ghana were on income tax and not gift tax. Therefore, this research aims to fill this research gap by assessing the level of compliance with gift tax among the Ghanaian taxpayers generally.

METHODOLOGY

The general approach adopted for this research was a survey. A questionnaire was used as the data collection instrument; it was administered to the respondents. The population for the study was basically formal sector employees in Kumasi Metropolis. The formal sector workers were selected and used for this research because it is assumed that, as they are in formal employment and are mostly literates, they might have had some level of knowledge about tax and hence provide an opportunity to measure the level of compliance among them. However, due to the vastness of the population, a purposive sampling approach was adopted to sample the respondents. In all 252 respondents were sampled for the study.

Analytical framework

Descriptive and inferential statistics with the help of SPSS and STATA econometric package were used to analyze the data. The respondents' decision to comply with the gift tax Act (provisions under the Internal Revenue Act, 2000 as amended) can be said to be dichotomous involving two mutually exclusive alternatives. The respondents may comply with the Act or may not comply with the Act. This results in a binary dependent variable. The framework for estimating models with binary dependent variables has its root in the threshold theory of decision making in which a reaction occurs only after the strength of a stimulus increases beyond the individual's reaction threshold (Hill and Kau, 1981). Therefore, the respondent when faced with a choice to comply with the gift tax Act has a reaction threshold which is influenced by several factors. Based on the reaction threshold the respondent may either comply or may not comply, leading to binary dependent variable y_i which takes on the values of zero (not comply with the Act) and one (comply with the Act)

The probability of observing a value of one is:

$$P_r = \left(y_i = \frac{1}{x_i \beta_i} \right) = 1 - F(x_i \beta_i) \qquad 1$$

where $F(.)$ is a cumulative distribution function; it is a continuous, strictly increasing function that takes a real value and returns a value which ranges from 0 to 1. Then, it follows that the probability of observing the zeros is:

$$P_r \left(y_i = \frac{0}{x_i \beta_i} \right) = F(-x_i \beta_i) \qquad 2$$

Table 1. Variables for the probit model.

Variables	Description	Measurement	Expected sign
AgeR	Age of the respondents	Age in years	+
AgeB	How low respondents have been in business	Age in years	+
Edu	Number of years spent in formal school	In years	+
Asso	Does the respondent belong to any association	dummy (1= if respondent belong to association ; 0 otherwise)	+
KnoTaxL	Knowledge of tax laws	Dummy variable ; 1 = has knowledge; 0 = Otherwise	+
Gender	gender of the business operator	dummy (1 = Male 0 = Otherwise)	+
Perp	Perception of filling procedures	dummy (1 = Cumbersome; 0 = Otherwise)	+
Size	Size of the business	that the net asset in Ghana Cedis	+
Aware	awareness of offences and penalties	dummy (1 = aware of the penalty, 0= Otherwise)	+
Dist	Distance to the nearest tax office in kilometres	Kilometres	-

Given such a specification, we determine the parameters for estimating this model using the maximum likelihood estimation approach. The dependent variable is an unobserved latent variable that is linearly related to by the equation:

$$y_i = \beta_i x_i + \mu_i \qquad 3$$

Where μ_i is a random disturbance term and x_i is independent variable which influences respondents' compliance decision. The observed dependent variable is determined by whether y_i exceeds a threshold value or otherwise:

$$y_i = \begin{cases} 1 \, if \, y_i^* > 0 \\ 0 \, if \, y_i^* \leq 0 \end{cases} \qquad 4$$

where y_i^* is the threshold value for y_i and is assumed to be normally distributed. Common models for estimating such parameters include probit (standard normal), logit (logistic) and tobit (extreme value) (Madala, 2005).

The model

This study adopted the probit model partly because of its ability to constrain the utility value of the decision to join variable to lie within 0 and 1, and its ability to resolve the problem of heteroscedasticity. Following Madala (2005), the probit model adopted for the study is specified as:

$$P_i = P(y_i^* < y_i).$$
$$P_i = P(y_i^* < \beta_0 + \beta_i x_i) = F(y_i)$$
$$\qquad 5$$
$$P_i = F(y_i) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{Z_i} e^{\frac{S^2}{2}} dS.$$

where P_i is the probability that a respondent will comply with gift tax act or not; S is a random variable which is assumed to be normally distributed with mean zero and unit variance; y_i is the dependent variable (decision to comply); y_i^* is as defined above. To obtain an estimate of the index Z_i , the inverse of the cumulative normal function is used:

$$y_i = F^{-1}(P_i) = \beta_0 + \beta_i x_i + \mu_i \qquad 6$$

$$y_i = \beta_0 + \beta_i x_i + \mu_i \qquad 7$$

Where $\beta_0, \beta_1, \beta_2 \dots \beta_{14}$ are parameters of the probit model; however, these parameters do not provide direct information about the effect of the changes in the independent or explanatory variables on the probability of respondents complying with the gift tax Act. The relative effect of each explanatory variable on the likelihood that a respondent will comply with the gift tax Act is given by:

$$\frac{\partial P_i}{\partial x_i} = \beta_i * \int(Z_i) \qquad 8$$

Where P_i is the mean dependent variable whose value is given in the probit results as:

$$\int(Z_i) = F^{-1}(P_i) \qquad 9$$

Guided by related studies (Toumi, 2007; Jackson and Milliron, 1986), the following factors are identified to influence compliance with gift tax by the respondents (Table 1).
    The empirical model is specified as:

$$y_i = \beta_0 + \beta_1 \text{AgeR}_i + \beta_2 \text{AgeB}_i + \beta_3 \text{Edu}_i + \beta_4 \text{Asso}_i + \beta_5 \text{KnoTaxL}_i + \beta_6 \text{Gender}_i + \beta_7 \text{Perp}_i + \beta_8 \text{Size}_i + \beta_9 \text{Aware}_i + \beta_{10} \text{Dist}_i + +\mu_i \qquad 10$$

RESULTS AND DISCUSSION

The result of the study revealed that out of the sample of 252 respondents studied, 131 (being 51.98%) were males, while 121 (48.02%) were females (Table 2), indicating that there were more males than females.
    The age characteristics of the sample studied revealed that those between the ages of 20-29 were about 50.00%; 30-39 formed about 28.97%; followed by those above 40 representing 21.03% (Table 3). Interestingly, this observation is similar to that of the observations in the 2010 Ghana National Population and Housing Census (GSS, 2013).
    An attempt was made to ascertain the educational background of the respondents as it does have an impact

Table 2. Gender distribution of respondents.

Gender	Frequency	Percentage (%)
Male	131	51.98
Female	121	48.02
Total	252	100.00

Source: Field Survey, July, 2014

Table 3. Age of respondents.

Age	Frequency	Percentage (%)
20-29	126	50.00
30-39	73	28.97
40-49	36	14.29
50 & above	17	6.75
Total	252	100.00

Source: Field Survey, July, 2014

Table 4. Educational background of the respondents.

Education	Frequency	Percentage (%)
SSCE	57	22.62
O' Level	12	4.76
A' level	7	2.78
Diploma	39	15.48
Degree	112	44.44
Not Applicable	25	9.92
Total	252	100.00

Source: Field Survey, July, 2014

Table 5. Years of working experience of the respondents.

Years of working experience	Frequency	Percentage (%)
1-5 yrs	118	46.83
6-10 yrs	59	23.41
11-15 yrs	27	10.71
16-20 yrs	17	6.75
21-30 yrs	19	7.54
31 & above	7	2.78
No response	5	1.98
Total	252	100.00

Source: Field Survey, July, 2014

Compliance with gift tax has been explained to the respondents as submission of returns on gifts received and receivable and paying the gift tax thereon in accordance with Section 108 of Internal Revenue Act, 2000 (Act 592 as amended). In this case a question was post as to whether the respondents have ever paid taxes. About 90% indicated that they had paid tax in the form of direct tax such as Pay As You Earn (PAYE) on employment income, as well as Indirect tax such as VAT. Out of 252 respondents, 226 responded in the affirmative (about 89.68%); 19 respondents (being 7.54%) indicated not ever having paid any tax; while 7 respondents (making up 2.78%) were not sure if they have ever paid any tax (Table 6).

Narrowing further to gift tax, the researcher attempted to find out whether the respondents have ever received gifts since if one does not receive gift, there is no likelihood of being liable to gift tax. The research revealed that while about 81% of the respondents have received gifts, 11% have not received gifts; about 4% were not sure whether they have received gifts or not, while further 4% respondents did not indicate any response as shown in Table 7.

The main sources or donors of the gifts as per the research findings were mainly from parents, children and other close relatives to business contacts as well as friends as depicted in Table 8. In some cases, the gifts were from a combination of the above mentioned sources.

The research revealed that even though a good number of the respondents received gifts, 80.95% (Table 9), being the majority, do not regularly submit returns on the gifts so received as required by the tax law.

The result indicates that 71.43% do not regularly submit returns on the gifts they do receive and only 6.75% do submit returns on gifts they receive. However 21.83% were not sure whether they do submit returns or not on the gifts they receive as shown in Table 10. This means non-compliance in terms of non-submission of returns on gifts is very high. This indicates, in other words, that compliance is very low.

on the level of compliance with the tax in question; it was observed that about 90% of the respondents are literates and only about 10% have not had formal education. The details are shown in Table 4.

From Table 4, those respondents who possess degrees represent 44.44% followed by those with SSCE (22.62%), diplomas (15.48%), O' and A' levels (7.54%); 9.92% have no educational qualifications.

Besides the demographic characteristics discussed above, the researcher was quick to dive into the working experience of the respondents. This is partly because it was assumed that those who have worked for some time may have had some experience of paying taxes including gift tax. Interestingly, although those who have been working between 1 to 5 years dominate with 46.83%, those who have worked for more than 5 years were in the majority (Table 5).

Thus, those with work experience ranging between 1 to 5 years dominated the respondents while those with work experience of 31 years and above formed the smallest part of the population; though 1.98% did not indicate their number of working years experience.

Table 6. Whether respondents have ever paid tax.

Have You ever paid tax	Frequency	Percentage (%)
No	19	7.54
Yes	226	89.68
Not Sure	7	2.78
Total	252	100.00

Source: Field Survey, July, 2014

Table 7. Whether Respondents Have Received Gifts.

Have you ever receive any gift	Frequency	Percentage (%)
No	27	**10.71**
Yes	204	**80.95**
Not Sure	11	**4.37**
No response	10	**3.97**
Total	252	100.00

Source: Field Survey, July, 2014

Table 8. Donors of Gifts Received.

Donors of gifts received	Frequency	Percentage (%)
Parents	28	9.59
Uncles / aunts	14	4.79
Brother / sister (biological)	21	7.19
Spouse	13	4.45
Children	5	1.71
Friends	77	26.37
Business contacts	16	5.48
Employer	4	1.37
Combination of more than one donor	84	28.77
No response	30	10.27
Total	292	100.00

Source: Field Survey, July, 2014

Table 9. Whether the respondents submit tax returns on gifts received.

Do you regularly submit return on taxable gifts received?	Frequency	Percentage
No	180	**71.43**
Yes	17	**6.75**
Not Sure	55	**21.83**
Total	252	100.00

Source: Field Survey, July, 2014

As a follow up to this the researcher sought to find out whether gift taxes are regularly paid on gifts that the respondents received regularly; and it came to light that only 15 respondents (making 5.95%) responded yes, 31 respondents (being 12.30%) said no, and a large number of 206 respondents (being 81.75%) were not sure as shown in Table 11. This still indicates very low compliance in terms of payment of gift tax.

In an attempt to find out the reasons for the non-compliance among the respondents, the respondents

Table 10. Whether respondents pay gifts tax on gifts received regularly.

Have you ever paid tax on taxable gifts received	Frequency	Percentage (%)
No	31	**12.30**
Yes	15	**5.95**
Not Sure	206	**81.75**
Total	252	100.00

Source: Field Survey, July, 2014

Table 11. Why respondents do not pay gift tax on gifts received.

Why not pay tax on taxable gifts received?	Frequency	Percentage (%)
Not aware of gift tax	179	**71.03**
Just do not want to pay	23	**9.13**
Commissioner has never asked for it	20	**7.94**
Have never receive gifts	9	**3.57**
Value of gift below threshold amount	21	**8.33**
Total	252	100.00

Source: Field Survey, July, 2014.

Table 12. Awareness of the Tax Laws Requirement for the Submission of Gift Tax Return on Gifts Received Within 30 Days after Receipt of the Gift.

Are you aware of the gift tax?	Frequency	Percentage (%)
No	186	73.81
Yes	31	12.30
Not Sure	23	9.13
No response	12	4.76
Total	252	100.00

Source: Field Survey, July, 2014

were asked to indicate the reasons why they were not paying the gift tax on the gifts they received: 71.03% indicated that they were not aware of the gift tax, 9.13% said they just did not want to pay, 8.33% indicated that the values of the gifts they received were below the threshold amount, 7.94% pointed out the Commissioner General of the Ghana Revenue Authority in charge of the Collection and administration of the tax has never asked for it, while 3.57% revealed that they had never received gifts.

Following the responses above, the research put across a follow up question as to whether the respondents were aware of the requirement of the tax law for the submission of return on gifts received or receivable within 30 days of receipt. The results were as depicted in Table 12. About 74% claimed they were not aware of the requirement; 12% indicated their awareness; 9% were not too sure if they were aware; and about 5% did not give a response. This revealed a very high level of unawareness of the gift tax requirement and hence the

high level of non-compliance in terms of submission and non-payment.

Besides the low level of compliance, it was surprising and more confusing to find out at this point that the respondents were aware of their obligation under gift tax law, and that more than 60% of the respondents are not willing to comply as shown in Table 13.

While 34.52% of the respondents indicated their readiness to honour the gift tax henceforth, 38.49% said no, 18.25% said they are not sure while 8.73% did not give a response.

Regression results of determinants of gift tax compliance

The result of the factors influencing gift tax compliance by formal sector employees in Kumasi Metropolis is presented in Table 14. Out of the 10 variables 4 of them have significant relationship with gift tax compliance.

Table 13. Whether respondents will pay the gift tax any time they receive a taxable gift henceforth.

Are willing to pay gift tax	Frequency	Percentage (%)
No	97	**38.49**
Yes	87	**34.52**
Not Sure	46	**18.25**
No response	22	**8.73**
Total	252	100.00

Table 14. Probit estimates for determinants of gift tax compliance.

Variables	Coefficient	t-statistic	Marginal Effect
Age of the respondents (AgeR)	0.006	1.264	0.002
How low respondents have been in business (AgeB)	0.036	0.782	0.014
Number of years spent in formal school(Edu)	0.057***	5.000	0.022
Does the respondent belong to any association (Asso)	0.055	1.155	0.017
Knowledge of tax laws (KnoTaxL)	0.289**	2.210	0.050
gender of the business operator(Gender)	0.278	1.408	0.073
awareness of offences and penalties(Aware)	1.587***	5.843	0.396
Perception of filling procedures (Perp)	0.488***	3.492	0.052
Size of the business(Size)	0.099	0.807	-0.038
Distance to the nearest tax office in kilometres(Dist)	-0.055	-0.453	-0.022
Constant	0.671	0.624	-

Note: *** indicates the variable is statistically significant at 99% confidence level, ** indicates the variable is statistically significant at 95% confidence level, and * indicates the variable is statistically significant at 90% confidence level. Log likelihood = -344.01797; Number of obs = 238; LR chi2(10) = 103.46; Prob > chi2 = 0.0000; Pseudo R2 = 0.1307.

Number of years spent in formal school has positive and significant relationship with gift tax compliance.

This implies that respondents who attained higher level of formal education are more likely to comply with gift tax Act as compared to those with low level of formal education. The reason for this observation might be the fact that with higher level of formal education the respondents can read and write and understand the implication of non compliance with the law. The marginal effect revealed that additional year spent in formal schools would increase the likelihood of compliance by 2%.

Respondent's knowledge of tax laws has positive and significant relationship with compliance. Individuals who have knowledge about the law are more likely to comply with the gift tax law as compared to their counterparts who do not have knowledge about the law.

Similarly, respondents who are aware of the penalty for non compliance are more likely to comply. This may be attributed to the fact that those with knowledge of the tax law and or have idea about the penalty for non compliance may be able to assess the risk of being caught for non compliance and consequent cost they have to incur. This may influence their decision to comply. Based on the marginal effect those with knowledge about the law are

5% more likely to comply compared with those who do not have knowledge about the law. Whilst those who are aware of the penalty are 39% more likely to comply with the law compared to their counterparts who are not aware of the penalty for non compliance.

Perception of procedures of filling of gift tax returns has positive and significant relationship with respondents' decision to comply with the law. The respondents may assess the cost of complying with the law, not only tangible cost but also intangible cost. Regarding gift tax return filing procedures, once they perceive it as cumbersome or time consuming they are likely to shy away from complying with the law as it may increase their cost of compliance.

CONCLUSION AND RECOMMENDATIONS

This study revealed that, although the taxation of gifts is provided for in the tax laws of Ghana specifically Internal Revenue Act, 2000 (Act 592 as amended), making compliance both statutory and civic obligations, the level of non-compliance is very high among the Ghanaian taxpayers. Some of the reasons identified by the study for the low level of compliance with gift tax among Ghanaian

taxpayers are: unawareness of gift tax obligations, those taxpayers who are aware do not feel obliged to pay; the non-enforcement by the tax officials; some taxpayers simply never receive taxable gifts; or the value of the gift is not above the exempt threshold. It was obvious from the study that the low level of education provided on the gifts tax by the tax officials and non-enforcement on their part coupled with the unwillingness by the taxpayers to voluntarily comply largely account for the very low level of compliance with gift tax among taxpayers in Ghana, specifically in the Kumasi metropolis. The above findings are very striking as Ghana, like all other developing countries, needs to exploit taxation as a means of sourcing revenue to finance developmental programmes and activities, as donor funds and grants are not forthcoming due to the economic challenges facing various nations after the financial meltdown in the west.

From the foregoing, it is therefore recommended that the Domestic Tax Revenue Division of the Ghana Revenue Authority intensifies tax education especially on the gifts tax obligations immediately, and puts in place measures to enforce such obligations.

Conflict of Interests

The authors have not declared any conflict of interests.

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