Review

The contextual framework of corporate income tax evasion

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The Portfolio Investment Framework, the Principal Agent Framework and the Principal Two Agents Framework of tax evasion, individually or collectively, are inadequate to represent fairly the dynamics of corporate income tax evasion. These behavior based frameworks are for the prediction of tax evasion and their usefulness for identifying tax evasion is limited. To bridge the gap between the prediction and the identification aspects of corporate income tax evasion, this paper presents the Contextual Framework of Corporate Income Tax Evasion, structured with twelve ideas and thirty five dynamics to guide and direct future research. With a simple game theory model, the paper promotes the tax audit cut-off policy that incorporates a reward program for the agent of government, ensures audit frequency and tests independence of the agent from governance.

Key words: Portfolio Investment Framework, Principle Agent Framework, Principle Two Agent Framework, Tax Evasion, Corporate Income Tax Evasion.

INTRODUCTION

Tax evasion is a loss of government revenue and is a major concern across nations. Recently, the estimated loss to tax evasion is approximately (USD$) $21 billion in the next five years in the United States (Adams, 2013), $30 billion a year in Russia (Amos, 2013), $21 billion a year in the United Kingdom (Wright, 2013) and $30 billion a year in Greece (Daley, 2010). On the other hand, these estimations are the estimated tax saves of tax evaders. The opposing loss or benefit of tax evasion between government and tax evaders is the reason why tax evasion keeps recurring and has persisted.

A key aspect in the combat against tax evasion is the ability of tax collectors to detect evasion. This aspect was ignored in the development of theoretical frameworks and modeling of tax evasion. Theoretical inquiries, however, concentrated on the prediction of tax evasion based on the logic of evasion behaviors. The ignoring of the detection aspect of evasion limits the usefulness of the behavior based frameworks because

the worth of the prediction is evaluated by the successful identification of evasion when it is executed.

The purpose of this paper is to present a contextual based approach, specifically, for corporate income tax evasion, to bridge the gap between the prediction and the identification of corporate income tax evasion. The main argument is that the context of tax evasion presents identifiable indicators of evasion that the behavior based approach ignored. And so, attentions are drawn herein to the dynamics of tax evasion in the corporate context that may indicate the existence of income tax evasion. This is essential for the correct understanding of the problem of corporate income tax evasion and is extremely important for strategizing of appropriate innovative actions in dealing with this problem. The intention is to offer a new framework to guide future research on this topic.

The remainder of this paper is structured in six sections. Section 2 describes the three commonly used

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tax evasion frameworks in the theoretical discussion of and modeling for corporate tax evasion and their inadequacies to the corporate setting. Section 3 describes the dynamics of the Contextual Framework of Corporate Income Tax Evasion (CFCITE). In Section 4, the basic ideas of the CFCITE are summarized. Section 5 provides a simple game theory model based on the CFCITE to explain tax audit strategies. In Section 6, the results and the practical applications of the basic model are discussed. Section 7 provides the conclusion remarks.

Three commonly used tax evasion frameworks

A tax evasion framework is a basic structure of ideas that provides the guiding principles and directions for constructing, analyzing and interpreting tax evasion. Because different frameworks offer different guidelines and directions, an inaccurate structure can cause us to make mistaken conclusions or attempt erroneous or impossible tasks. To avoid such problems, is to ensure the accuracy of the frameworks used for examining corporate income tax evasion.

Theoretical discussions and modeling of and for corporate income tax evasion are commonly based on three tax evasion frameworks – the 'Portfolio Investment Framework' (PIF), 'Principal Agent Framework' (PAF) and the 'Principal Two Agent Framework' (PTAF). These frameworks were developed originally to explain the tax evasion behavior of individual taxpayers but were later adopted or extended by researchers and economists to explain the tax evasion behavior of a corporation, which in fact does not exist.

The PIF was developed by Allingham and Sandmo (1972) to explain the evasion behavior of individual taxpayers as a portfolio investment decision that reflects taxpayer's rationality and response to punishment and uncertainty. The basic structure of this framework consisted of four ideas. First, tax evasion is an investment decision made under uncertainty circumstances. Second, punishment deters evasion behavior as in the economics of criminal activity proposed by Becker (1968) and by Tulkens and Jacquemin (1971). Third, uncertainty for detection and conviction promotes risk takings as in the economics of uncertainty explained by Arrow (1970) and Mossin (1968). Fourth, an individual is risk averse as in the axioms for behavior under uncertainty proposed by Von Neumann-Morgenstern (1947). With these ideas, Allingham and Sandmo (1972) showed that tax evasion of individual taxpayers is deterred by a higher probability of detection and encouraged by higher tax rates.

Reinganum and Wilde (1985) developed the PAF to determine the optimal audit policy of the IRS[1]. This framework is structured with five ideas. First, taxation is

a Principal-Agent relationship between tax-collecting agency (principal) and taxpayer (agent). Second, income is a random variable. Third, the agent freely observes his or her true income but the principal can only observe it at a cost (audit costs). Fourth, this is a relationship of two parties with opposing interests where the principal seeks to maximize tax collected from the agent, net of audit costs, while the agent seeks to minimize tax paid to the principal. Fifth, the reported income of the agent conveys information about the agent's true income to the principal. In the Principal-Agent relationship, the principal asks the agent to report his or her income and then assesses the reported income to determine its truthfulness. If the reported income is deemed to be too low it triggers an audit (audit cutoff policy) at a cost to the principal.

Kim and Park (1990) departed from the PAF and proposed the PTAF, arguing that in the real world the tax collectors, who are different from government, collect the taxes from taxpayers on behalf of and for the government. This framework was developed to explain the possibility of bribery in the process of collecting taxes. The framework is structured with three ideas. First, tax collector (agent of government) collects taxes on behalf of government (the principal) from the taxpayer (who is also an agent of government). This gives the name "*Principal Two Agents*". Second, tax reporting and tax auditing is a three-person game (a sequential game) in which the principal must induce the tax collector not to accept bribery and implement a system that discourages the taxpayer from evading taxes. Third, the players are intellectual rational individuals who behave strategically to maximize personal utility.

There are three major problems in the uses of the PIF, the PAF and the PTAF to explain corporate income tax evasion. First, identifying of the taxpayer as the tax evader is not the case with corporate income tax evasion. Second, these frameworks are behavior based but a corporation is an artificial person without evasion behavior. Third, these frameworks do not offer a just and fair representation of the dynamics of corporate income tax evasion.

First, the PIF, the PAF and the PTAF were framed with the assumption that the taxpayer is the tax evader. This is not so in corporate income tax evasion because a corporation is the taxpayer but is not the tax evader. An evader is "any person who knowingly makes a false or misleading statement or omits from such statement any material particular which lessens his tax liability" (Government of Tonga, 2002). A corporation, however, is a legal person[2] created by law (Friedman, 1970), distinct and separate from its individual owners or shareholders, who is incapable of knowingly evading tax.

Although a corporation has legal rights and obligations in the same way that a natural person does, it requires a

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[1] The tax-collecting agency in Tonga is the Revenue Services Department.

[2] Commonly referred to as artificial person, fictitious person, legal entity or body corporate.

natural person, an agent, to act and make decisions on its behalf. And so, tax evasion decisions are decisions made by the agent[3] not the corporation. Therefore, the agent is the central party for the investigation of corporate income tax evasion. However, this does not free the corporation from the penalty of tax evasion because, as the principal, the corporation remains liable for the decisions of the agent.

Secondly, the behavior based approach examines the evasion behaviors of taxpayers identified by the PIF, PAF and PTAF as behaviors under uncertainty, towards risk and punishment, and the ability to make rational decisions. These are dispositions of a natural person not of a legal person. Just so, the behavior based approach is suitable for the investigation of individual tax evasion but is inappropriate for corporate income tax evasion.

In addition, tax evasion is commonly discussed as a moral choice. But such choice can only be made by a natural person because only a natural person has or lacks intrinsic qualities, that is, the virtues of prudence, temperance, fortitude, justice, charity, faith and hope which are the intrinsic qualities of a moral person identified by virtue ethics and Christianity. And so, to infer that a corporation is the tax evader advocates that a corporation is capable of making moral choices. Although a corporation has legal rights, privileges, responsibilities and liabilities, as an investor, a borrower, a customer and so forth that may associate a corporation with the morality of the choice (deontology), the consequence of the choice (consequentialism) and the moral consensus for the situation (situational morality), it is incapable of knowingly choosing right from wrong.

Further, the behavior based approach requires behavioral information. But information about the evasion behaviors of an evader is neither disclosed in a tax return nor possible to deduce from it. Therefore, the usefulness of the behavior based approach, by itself, for identifying tax evasion lacks merit.

Thirdly, the PIF, the PAF and the PTAF, individually or collectively, are inadequate to offer just and fair representations of the dynamics of corporate income tax evasion. The inadequacies relate to the ignoring of parties, like directors and auditors, who can significantly compel or constrain an evasion decision, the relationships between the parties in corporate settings and the influences of the environments.

Collectively, the PIF, the PAF and the PTAF identified four parties in the income tax relationship, who are the taxpayer, the agent of a corporation, the tax collectors as agent of government and the government or tax authorities. The power of the owners, the directors and other external parties to induce or discourage evasion decisions are ignored. As a result, these behavior based approach ignored the usefulness of third party information for identifying the existence of an evasion.

But third party information, such as, the tax returns of the owners, the directors, a subsidiary of the corporation, and so forth of a corporation can be used to verify the truthfulness of the tax return of a corporation.

Further, the behavior based approach emphasized evasion behavior as a responding mode strictly based on rationalization of benefits and consequences. Social interactions and the influences of the environment are ignored. This paper argues that social factors or relationships and environmental factors are important elements of tax evasion. To ignore these elements from the constructions of evasion frameworks impaired the usefulness of a framework to drive theoretical discussions of and modeling for corporate income tax evasion.

The CONTEXTUAL FRAMEWORK OF CORPORATE INCOME TAX EVASION

The contextual based approach presents corporate income tax evasion as a strategic decision of a natural person (the agent) to evade the income tax of a legal person (the principal) in a contextual setting comprised seven parties, twenty four relationships and four environments. These formed the thirty five dynamics that framed the Contextual Framework of Corporate Income Tax Evasion as shown in Figure 1.

Parties are the persons, both natural persons and legal persons, who influenced directly or indirectly the decisions to evade corporate income taxes. They are denoted in Figure 1 as number (24), (25), (26), (27), (28), (29) and (30). Their involvement or influence exists either in the form of formal contracts or via professional or social associations. They[4] are the owner, the director, the corporation, the CEO, the government, the tax collector and the external parties. The owner is the investor who invests in the corporation with an intention to gain maximum returns on his or her investment. The owner appoints the director to govern the "affairs"[5] of the corporation and to ensure maximum returns on the owner's investment. The director then engages the CEO to manage the corporation under the directions and supervisions of the director. External parties refer to external auditors, competitors, financial institutions, other organizations and all those whose formal and social associations affect directly or indirectly the evasion decisions of the CEO and or the honesty of the tax collect taxes from all parties and thus employs the tax collector to collect the taxes on its behalf. Each party has

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[3] Revenue Services Administration Act 2002, Section 2(1)(b) identify the agent of corporation as the "chief executive officer" synonymously referred to in Tonga as "general manager", "managing director" or "manager".

[4] For simplicity purposes, the parties are expressed in singular form.

[5] Companies Act 1995, Section 127(1)(2) and (3): "Management of the company: (1) The business and affairs of a company shall be managed by, or under the direction or supervision of, the board of the company. (2) The board of a company has all the powers necessary for managing, and for directing and supervising the management of, the business and affairs of the company. (3) Subjections (1) and (2) are subject to any modifications, exceptions or limitations contained in this Act or in the Company's constitution."
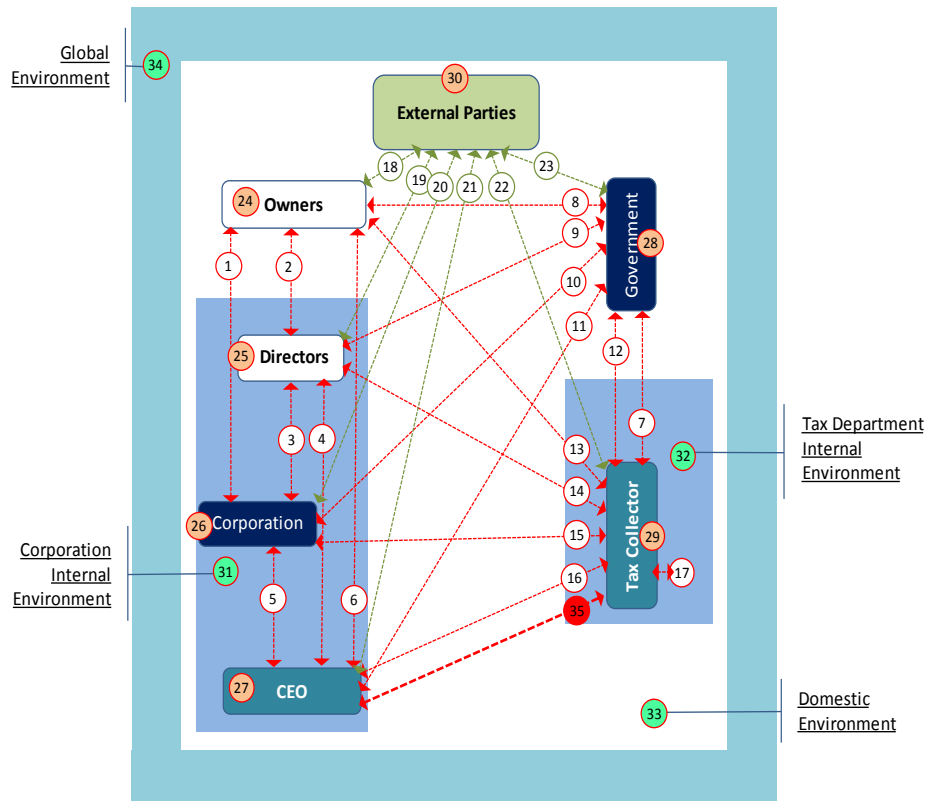
Figure 1. The context of corporate income tax evasion.

collector. The government has a constitutional right[6] to multiple roles and plays multiple positions. For example, the CEO is an individual, citizen of society, taxpayer, employee, tax agent of the corporation, a subordinator of the director and so on.

The characteristics of the individual party are important to the identifications of corporate income tax evasion. This requires information about the identity, size or numbers, status, type and authority of each party. Examples are: is the owner a legal or natural person, how many directors are in the board, is it a family or government or public corporation, and what is the degree of control or the percentage of the share-holdings? The characteristics of the parties provide information about how easy it is to induce and support an evasion decision, the costs for enticing an agent to evade tax and the degree of influence of each party on the agent. Example, if the corporation has one owner and this owner is the only director, then the difficulty that

may involve in persuading other owners or members of the board to approve and support an evasion decision does not exist. And so, the influence of the owner/director on the agent is high. Another example, a public or government owned corporation is subject to a higher degree of scrutiny and accountability than a private or family corporation. And so, there is a higher possibility to evade corporate income tax in a family corporation than in a government owned enterprise. Another example, a tax return supported by financial statements audited by one of the big four auditors is more reliable than one supported by a newly established audit firm or a private auditor.

In relationships, Figure 1 identified twenty four relationships in corporate income tax denoted as numbers (1) to (23) and (35). For simplicity, the relationships within a corporation and within the Revenue Services Department are excluded but they are equally important. The twenty four relationships can be classified under eight groups as shown in Table 1.

Each relationship in Group 8 is determined by the role and position of the each external party to the owner, the director, the corporation and the CEO. Examples, the external party may be an investee, a family member, a lender, a supplier, a customer, an auditor or a subsidiary of the owner, the director, the corporation or the CEO. Relationship (35) represents the game of corporate income tax evasion, a game between the agent of the

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[6] Act of Constitution of Tonga, Clause 18 and Clause 19(b): "All the people have the right to expect that the Government will protect their life liberty and property and therefore it is right for all the people to support and contribute to the Government according to law…."; "The Treasurer, with the approval of Privy Council, shall have power to increase or decrease the taxes and/or customs duties and shall have power to levy new taxes and/or customs duties, and all such increase or decreases or new taxes or customs duties shall be published in the Gazette and shall have full force and shall remain effective from the date of publication in the Gazette until rescinded by the Legislative Assembly or by the Treasurer with the approval of Privy Council."

Table 1. Relationship groups.

Groups	Numbers
1. Investor – investee relationship	(1)
2. Principal – agent relationship	(2), (3), (5) and (7)
3. Agent – investee relationship	(4)
4. Agent – agent relationship	(4) and (35)
5. Investor – agent relationship	(6)
6. Citizen – government relationship	(8), (9), (10), (11), (12) and (23)
7. Taxpayer – tax collector relationship	(13), (14), (15), (16), (17) and (22)
8. Other relationships	(18), (19), (20) and (21)

corporation (the CEO) and the agent of government (the tax collector). In this relationship, the CEO seeks to minimize the income tax payments of the corporation thereby minimizing the tax revenue of the government and the tax collector seeks to maximize the revenue of the government by maximizing the income tax payments of the corporation. However, the results of this game can be influenced by the twenty four relationships of corporate tax evasion. Therefore, it is important to identify the relationship indicators that may encourage evasion decisions.

Lack of independence, conflict of interests and lack of segregation of duties are trademarks of corruption, theft and tax evasion but these are ignored by the PIF, PAF and PTAF. In corporate income tax evasion, the exis-tence of these trademarks can be identified in the relationships between the multiple role play of the individual party and between the parties. Example, if the owner or the majority controlling shareholder is also the managing director, then conflict of interest is present as there is no independence and segregation of duties between ownership, governance and the agent. In this case, the cost for enticing an agent to evade tax is eliminated and the benefits derived by the owner/ director/agent from an evasion are high and so the possibility to evade tax is also high. Another example, if the tax collector is an investor in the corporation or a friend or family of the agent or the director or the owner, the possibility for collusion between the tax collector and the agent to evade tax is high. Relationships between the parties can be easily established from the tax returns of the corporation or from third party information.

Several studies identified incentive structures and organizational culture (Ferrell et al., 1989; Travino, 1986), ambient lighting (Zhong et al., 2010), environ-mental wealth (Gino and Pierce, 2009) and moral standards of a society (Fukofuka, 2013) as environ-mental factors that influenced choice behavior. And so, the four environments that influenced evasion decisions are denoted in Figure 1 as numbers (31), (32), (33) and (34).

The internal environment consists of the employees, the physical environment, procedures and systems, internal controls, organizational culture and factors within a corporation that not only influence the activities and choices of the agent but may also indicate the possible existence of tax evasion. To falsify a tax return and financial statements, it requires an override of the accounting systems. And so, internal environmental indicators of evasion may include weak accounting internal control systems, lack of independence and segregation of duties within a corporation, reliance on cash transactions, poor record keeping, absence of a qualified in- house accountant, employees in the finance department are dominated by family members and high turnover of employees in the finance department.

The internal environment of the Revenue Services Department does not only affect the decisions of the tax collector but also influences the evasion decisions of the CEO. The perceived probability of detection refers to the CEO's perceptions of the ability of the Revenue Services Department to detect evasion. Ability includes compe-tency level, efficiency level, effectiveness level and the internal environment of the Revenue Services Depart-ment. Therefore, the tax collector should likewise assess the ability of the CEO to evade tax. This requires an assessment of the internal environment of a corporation.

The domestic environment consists of domestic forces that affect the evasion decision of the CEO and the assessment and audit decision of the tax collector. These include technological force, sociocultural force, demographic force, political force and legal force. The global environment is the sum total of the domestic environments of the international communities. The domestic and global environments generally affect the parties. However, in spite of the general effect, they are important elements for the understanding of tax evasion. Example, the greater the differences between the income tax rate for corporation and the tax rates for withholding tax, PAYE tax and personal income tax, the greater the temptation to transfer corporate assets and income to a third party at a lower tax rate. Another example, the lower the economic condition in a country the greater the vulnerability of the parties for bribery and unethical conducts.

Now, the most common methods of corporate income tax evasions, listed in BizFilings Toolkit (2013), are (a) deliberately under-reporting or omitting income like not

reporting sales; (b) keeping two sets of books and making false entries in books and records; (c) claiming false or overstating expenses like overstating travel expenses or paying family members for work they did not perform; (d) claiming personal expenses as business expenses; (e) hiding or transferring of assets or income to a third party; and (f) engaging in a sham transaction as in labeling a transaction as something it is not. Depending on the evasion method used by the evader, other forms of evasion are also performed as part of the cover up. Examples, the evading of consumption tax to cover up the under-reporting or omitting of sales or the evading of personal income tax to cover up personal income acquired from the evasion. In some cases, like the transferring of income to a third party at a lower tax rate, the evaded income may be reported by the third party to alleviate the suspicions of the tax collector.

The PIF, the PAF and the PTAF are limited for strategizing of appropriate innovative actions in dealing with these common corporate income tax evasion methods because these frameworks offered no indicators for identifying evasion. But with the contextual based approach, there is a better chance of being able to identify them by considering the existence of evasion indicators provided by the parties, their relationships and the environments.

The basic ideas of the contextual framework of corporate income tax evasion

To summarize the basic ideas, the Contextual Framework is structured with the following twelve ideas.

First, the corporation is the taxpayer but not the evader of corporate income tax because a corporation is a legal person who is incapable of making evasion decisions. The evader is the agent or the CEO of the corporation.

Second, a corporation, as a principal, passively shares the consequences of and perhaps the benefits from an evasion.

Third, corporate income tax is an Agent-Agent relationship between the agent of the corporation and the agent of government each represents and acts in the best interests of their respective principals. However, the agents will not always act in the best interest of the principals (Jensen and Meckling, 1976) because if the agents perceive that the probability of detection is low and the benefit acquired from an evasion is high, the agents will deviate from protecting the interests of the principal to maximize personal interests.

Fourth, since corporate income tax evasion is an agency relationship, it encourages tax evasion and "bribery" (Kim and Park, 1990).

Fifth, the agent of a corporation and the agent of the government are natural persons and risk averse individuals (Allingham and Sandmo, 1972).

Sixth, the agent of the corporation will evade the income tax of the corporation if and only if the agent perceives to personally benefit directly or indirectly from the evasion. Also, the agent of the government will accept bribes for the same reason.

Seventh, taxation is a game of information. The agent of a corporation submits a false or misleading corporate tax return or omits from such return any material particular which lessens the tax liability of the corporation. The tax collector then employs direct and indirect methods to assess the submitted tax return to identify evasion. Direct methods refer to the assessing of the accuracy and reasonableness of figures and information disclosed in a tax return. Indirect methods involve the determination of the correct taxable income by analyzing the contextual factors. Based on the evidence from the assessment, the tax collector accepts or amends the taxable income of the corporation or performs an audit thereon.

Eighth, a tax audit imposes audit costs on the principals but not on the agents. That is, government bears the costs of performing the audit and the corporation acquires the costs for accommodating the tax audit.

Ninth, certain characteristics of the individual parties, such as the size of a corporation, having offshore branches, size of the board of directors, type of ownership, and nature of the company, may indicate the presence of tax evasion or a specific method of evasion.

Tenth, tax evasion is influenced by both the personal morality of the agent and the consensus morality of situations or the context.

Eleventh, lack of independence, conflicts of interest and lack of segregation of duties between parties can be indicators of tax evasion.

Twelfth, the evasion decisions and tax assessments are influenced by the internal environment of the corporation, the internal environment of the taxation department, the domestic environment, and the global environment, particularly, those factors that esteem unethical conduct. Accordingly, there are indicators of tax evasion in the environments.

Basic model and the CFCITE

The basic model considers a two person game. One is the Agent of the Corporation (AC) and the other the Agent of the Government (AG). In this game, the AC is uncertain whether the AG will conduct a tax audit or not on the tax return of the Corporation filed by the AC. This uncertainty implies the equilibrium of the game is mixed strategy equilibrium and not pure strategy equilibrium.

The AC has two strategies: forge the tax return of the Corporation (t_1) at probability p_{t1} or lodge true return (t_2) at probability p_{t2}, and $p_{t1} + p_{t2} = 1$. The AG also has two strategies: conduct tax audit (a_1) at probability p_{a1} or no tax audit (a_2) at probability p_{a2}, and $p_{a1} + p_{a2} = 1$.

To assess the influence of independence, two cases will be assessed. Case one: the parties are independent of each other and case two there is no independence. In

Table 2. Case one strategies matrix.

Player 1: AC	Player 2: AG	
	a_1 **conduct tax audit**	a_2 **no tax audit**
t_1 *forge tax return*	$\mu_{ac} + \varepsilon - \varphi_{ac}$	$\mu_{ac} + \varepsilon$
	β	$-\delta$
t_2 *lodge true return*	0	0
	$-\propto$	0

case one, the costs of evasion to the corporation (C_μ) are shared between the parties collaborated in evading the income tax of the corporation. Assuming all parties involved with the exception of the AG, then C_μ = AC's share (μ_{ac}) + Owner's share (μ_o) + Director's share (μ_d) + Other Parties' share (μ_p). If the AG performed strategy a_1, the evasion will be discovered and the involved parties will be penalized. And so, the fines will be: the corporation = φ_{co} = tax rate (true income – underreported income), the AC = φ_{ac} = tax rate (μ_{ac}), the Owner = φ_o = tax rate (μ_o), the Director = φ_d = tax rate (μ_d), and the Other Parties = φ_p = tax rate (μ_p). Therefore, the expected returns of the parties in case one are as follows.

Corporation: Tax rate (true income – underreported income) – C_μ – tax audit assistance cost – φ_{co}

AC: μ_{ac} – evasion other related gain – φ_{ac}
Owner: $\mu_o - \varphi_o$
Director: $\mu_d - \varphi_d$
Other Party: $\mu_p - \varphi_p$
Government: $\varphi_{co} + \varphi_{ac} + \varphi_o + \varphi_d + \varphi_p$ – audit cost – AG bonus
AG: Bonus – $\propto - \delta$

where tax audit assistance cost, φ_{co}, φ_{ac}, φ_o, φ_d, φ_p, audit cost and AG bonus only if AG performed strategy a_1. The evasion other related gain (ε) refers to the AC other forged returns related gains (such as booking of personal expenses as company's expenses) and $\varepsilon \in [0, \varphi_{ac}]$. The AG bonus ($\beta$) is a percentage of the Government net income from strategy a_1, that is, $\beta = \pi\% (\varphi_{co} + \varphi_{ac} + \varphi_o + \varphi_d + \varphi_p - audit\ cost)$.
If the AG performed strategy a_1 whereas the AC performed strategy t_2, then the AG acquired an economic and social loss = $\propto$ for incurring an audit cost to the Government for no return. On the other hand, if the AG performed strategy a_2 whereas the AC performed strategy t_1, then the AG acquired an economic and social loss = δ for failure to recover the evaded tax and the penalties thereon.
The strategies matrix of the AC and the AG for case one are shown in Table 2.
The following calculations were conducted to identify

the mixed strategies Nash Equilibrium of the game.

First, identify the AG's expected return p^*_{t1} from the strategies:

$$\begin{aligned} \mu_{AG1} &= (\beta).p_{t1} + (-\delta).p_{t2} \\ &= (\beta).p_{t1} + (-\delta).(1 \\ &\qquad\qquad - p_{t1}) \\ &= \beta.p_{t1} - \delta + \delta.p_{t1} \\ &= p_{t1}(\beta + \delta) - \delta \qquad (1) \\ \mu_{AG2} &= (-\propto).p_{t1} + 0.p_{t2} \\ &= -p_{t1}.(\propto) \qquad (2) \end{aligned}$$

Let $\mu_{AG1} = \mu_{AG2}$ and solves for p^*_{t1}:
$$\begin{aligned} p_{t1}(\beta + \delta) - \delta &= -p_{t1}.(\propto) \\ p_{t1}(\beta + \delta + \propto) &= \delta \\ p^*_{t1} &= \frac{\delta}{\beta + \delta + \propto} \end{aligned}$$

This means, if the probability of adopting strategy t_1 by the AC is less than $\frac{\delta}{\beta+\delta+\propto}$, then the AG optimal selection is strategy a_2 (no tax audit). On the other hand, if the probability of adopting strategy t_1 by the AC is greater than $\frac{\delta}{\beta+\delta+\propto}$, then the AG optimal selection is strategy a_1 (conduct tax audit). However, if the probability of adopting strategy t_1 by the AC equals to $\frac{\delta}{\beta+\delta+\propto}$, then conducting a tax audit or no tax audit make no difference to the AG.

Second, identify the AC expected return p^*_{a1} from the strategies:
$$\begin{aligned} \mu_{AC1} &= (\mu_{ac} + \varepsilon - \varphi_{ac}).p_{a1} + (\mu_{ac} + \varepsilon).p_{a2} \\ &= (\mu_{ac} + \varepsilon - \varphi_{ac}).p_{a1} + (\mu_{ac} + \varepsilon)(1 \\ &\qquad\qquad - p_{a1}) \\ &= (\mu_{ac} + \varepsilon - \varphi_{ac}).p_{a1} + (\mu_{ac} + \varepsilon) \\ &\qquad\qquad + p_{a1}(-\mu_{ac} - \varepsilon) \\ &= p_{a1}.(-\varphi_{ac}) + \mu_{ac} + \varepsilon \qquad (4) \\ \mu_{AC2} &= 0.p_{a1} + 0.p_{a2} \\ &= 0 \qquad (5) \end{aligned}$$
Let $\mu_{AC1} = \mu_{AC2}$ and solves for p^*_{a1}:
$$\begin{aligned} p_{a1}.(-\varphi_{ac}) + \mu_{ac} + \varepsilon &= 0 \\ p_{a1}.(-\varphi_{ac}) &= -\mu_{ac} - \varepsilon \\ p^*_{a1} &= \frac{\mu_{ac} + \varepsilon}{\varphi_{ac}} \qquad (6) \end{aligned}$$

Table 3. Case two strategies matrix.

Player 1: AC	Player 2: AG	
	a_1 **conduct tax audit**	a_2 **no tax audit**
t_1 *forge tax return*	$\mu_{ac} + \mu_o + \mu_d + \varepsilon - \varphi_{ac} - \varphi_o - \varphi_d$ β	$\mu_{ac} + \mu_o + \mu_d + \varepsilon$ $-\delta$
t_2 *lodge true return*	0 $-\propto$	0 0

This means if the probability of the AG adopting strategy a_1 is less than $\frac{\mu_{ac}+\varepsilon}{\varphi_{ac}}$, then the AC optimal selection is strategy t_1 (forge tax return). On the other hand, if the probability of the AG adopting strategy a_1 is greater than $\frac{\mu_{ac}+\varepsilon}{\varphi_{ac}}$, then the AC optimal selection is strategy t_2 (lodge true return). However, if the probability of the AG adopting strategy a_1 equals $\frac{\mu_{ac}+\varepsilon}{\varphi_{ac}}$, then to forge tax return or lodge true return makes no difference to the AC.

Therefore, the Mixed Strategy Nash Equilibrium of this model is $\{p^*_{t1} = \frac{\delta}{\beta+\delta+\propto}$, and $p^*_{a1} = \frac{\mu_{ac}+\varepsilon}{\varphi_{ac}}\}$. Accordingly, in the case where the parties are independent of each other, the AG conducts tax audit at the probability of $\frac{\mu_{ac}+\varepsilon}{\varphi_{ac}}$, and the AC forges the tax return of the corporation at the probability of $\frac{\delta}{\beta+\delta+\propto}$.

In case two, assuming there is no independence between the Owner, the Director and the AC, that is, the Owner is the Director as well as the AC, then the expected returns of the parties in case two are as follows.

Corporation: Tax rate (true income – underreported income) – C_μ – tax audit assistance cost – φ_{co}

AC: $\mu_{ac} + \mu_o + \mu_d - \varepsilon - \varphi_{ac}$
Other Party: $\mu_p - \varphi_p$
Government: $\varphi_{co} + \varphi_{ac} + \varphi_p + \varphi_o + \varphi_d$ – audit cost – AG bonus
AG: $\beta - \propto - \delta$

Then the Strategies Matrix of the AC and the AG in case two are shown in Table 3.

First, identify the AG's expected return p^*_{t1} from the strategies. However, the AG's expected return in case two remains the same as in case one because $\beta, -\delta$ and $-\propto$ do not change. Therefore, the AG optimal selection strategies in response to the probability of adopting strategy t_1 or strategy t_2 by the AC are the same as in case one.

Second, identify the AC expected return p^*_{a1} from the strategies:

$$\mu2_{AC1} = (\mu_{ac} + \mu_o + \mu_d + \varepsilon - \varphi_{ac} - \varphi_o - \varphi_d).p_{a1}$$
$$+ (\mu_{ac} + \mu_o + \mu_d + \varepsilon).p_{a2}$$
$$= (\mu_{ac} + \mu_o + \mu_d + \varepsilon - \varphi_{ac} - \varphi_o - \varphi_d).p_{a1}$$
$$+ (\mu_{ac} + \mu_o + \mu_d + \varepsilon)(1 - p_{a1})$$

$$= (\mu_{ac} + \mu_o + \mu_d + \varepsilon - \varphi_{ac} - \varphi_o - \varphi_d).p_{a1}$$
$$+ (\mu_{ac} + \mu_o + \mu_d + \varepsilon)$$
$$+ p_{a1}(-\mu_{ac} - \mu_o - \mu_d - \varepsilon)$$

$$= p_{a1}.(-\varphi_{ac} - \varphi_o - \varphi_d) + \mu_{ac} + \mu_o + \mu_d + \varepsilon \quad (7)$$

$$\mu2_{AC2} = 0.p_{a1} + 0.p_{a2}$$
$$= 0 \quad (8)$$

Let $\mu2_{AC1} = \mu2_{AC2}$ and solves for p^*_{a1}:
$$p_{a1}.(-\varphi_{ac} - \varphi_o - \varphi_d) + \mu_{ac} + \mu_o + \mu_d + \varepsilon = 0$$
$$p_{a1}.(-\varphi_{ac} - \varphi_o - \varphi_d) = -\mu_{ac} - \mu_o - \mu_d - \varepsilon$$
$$p^*_{a1} = \frac{\mu_{ac} + \mu_o + \mu_d + \varepsilon}{\varphi_{ac} + \varphi_o + \varphi_d} \quad (9)$$

This means if the probability of the AG adopting strategy a_1 is less than $\frac{\mu_{ac}+\mu_o+\mu_d+\varepsilon}{\varphi_{ac}+\varphi_o+\varphi_d}$, then the AC optimal selection is strategy t_1 (forge tax return). On the other hand, if the probability of the AG adopting strategy a_1 is greater than $\frac{\mu_{ac}+\mu_o+\mu_d+\varepsilon}{\varphi_{ac}+\varphi_o+\varphi_d}$, then the AC optimal selection is strategy t_2 (lodge true return). However, if the probability of the AG adopting strategy a_1 equals $\frac{\mu_{ac}+\mu_o+\mu_d+\varepsilon}{\varphi_{ac}+\varphi_o+\varphi_d}$, then to forge tax return or lodge true return makes no difference to the AC.

Therefore, the Mixed Strategy Nash Equilibrium of case two is $\{p^*_{t1} = \frac{\delta}{\beta+\delta+\propto}$, and $p^*_{a1} = \frac{\mu_{ac}+\mu_o+\mu_d+\varepsilon}{\varphi_{ac}+\varphi_o+\varphi_d}\}$. Accordingly, in this case where independence is lacking, the AG conducts tax audit at the probability of $\frac{\mu_{ac}+\mu_o+\mu_d+\varepsilon}{\varphi_{ac}+\varphi_o+\varphi_d}$, and the AC forges the tax return of the corporation at the probability of $\frac{\delta}{\beta+\delta+\propto}$.

DISCUSSION OF THE BASIC MODEL AND PRACTICAL APPLICATIONS

The strategies matrixes in Table 1 and Table 2 indicate that when $\mu_{ac} + \varepsilon > \varphi_{ac}$ and $(\mu_{ac} + \mu_o + \mu_d + \varepsilon) > (\varphi_{ac} + \varphi_o + \varphi_d)$ for case one and case two respectively, the AC's expected return from strategy t_1 is higher than the AC's expected return from strategy t_2. For these reasons, some of the ACs are motivated to forge tax

returns in spite of the known penalties for doing so. Furthermore, if the AG decides not to conduct a tax audit when the AC selects t_1, the AG loss will be greater than zero because at $\{t_1, a_2\}$ the AG loss equals $-\delta$.

For practical applications, the model provides three strategies for tax audit policy. First, rewarding of the AG for the capturing of tax evasion reduces the tax evasion. Second, high frequency of tax audit reduces tax evasion. Third, lack of independence between the AC and the owner and/ or the director is indicator of tax evasion. To test the validity of these suggestions, the model must satisfy the following conditions.

Condition 1: if the rewarding of the AG for the capturing of tax evasion reduces corporate income tax evasion, then an increase of β should reduce the probability at which the AC evades the income tax of the corporation.

Condition 2: if the increase of tax audit frequency reduces tax evasion, then an increase of $\propto$ or a decrease of β should reduce the probability at which the AC evades the income tax of the corporation.

Condition 3: if the lack of independence between the AC and the owner and/or the director increases tax evasion, then $\frac{\mu_{ac}+\mu_o+\mu_d+\varepsilon}{\varphi_{ac}+\varphi_o+\varphi_d}$ is greater than $\frac{\mu_{ac}+\varepsilon}{\varphi_{ac}}$.

REWARD PROGRAM FOR THE AG

Reward program, particularly for whistleblower, has been regulated and implemented in the United States of America as one of the means of combating tax evasion. Since December 2006, Congress is willing to pay a minimum of 15% and a maximum of 30% of the amount that the IRS actually collects to an informant who provides "specific and credible" information that will "substantially" lead to the determination and collection of $2 million or more of tax (Tax Whistleblower Law Firm, 2013; IRS of the United States of America, 2013). The purpose of this new incentive is to encourage people who otherwise would not step forward and report tax fraud; and the program was estimated to raise approximately $182 million over 10 years (Herman, 2006). The basic premise of the reward program is that reward will attract whistleblowers because whistleblowers are rational individuals who seek to maximize personal utility.

On this same premise, this paper suggests that since the AG is a rational person who seeks to maximize personal utility, the rewarding of the AG (β), based on the AG's ability to capture evasion, will encourage the AG's commitment to capture tax evasion; and since the AC is also a rational person, the AC's knowledge of such reward will reduce the probability at which the AC evades corporate income tax. Reward or bonus herein refers to the incentives offered on top of the AG's basic salary.

Since the model established β as one of the denominators in the AC's evasion probability $\frac{\delta}{\beta+\delta+\propto}$, it suggests that an increase of β, if δ and $\propto$ remain constant, will reduce the probability at which the AC evades corporate income tax. Alternatively, if β is eliminated from the model and then recalculate the probability at which the AC forges tax return, the new probability is $\frac{\delta}{\delta+\propto}$. And since $\beta > 0$, it means that $\frac{\delta}{\delta+\propto}$ is greater than $\frac{\delta}{\beta+\delta+\propto}$. Therefore, Condition 1 is supported.

Accordingly, the model shows that if Government implements a program that rewards the AG for the capturing of tax evasion, such program will reduce corporate income tax evasion.

Frequency of tax audit and audit policy

Prior studies about the best method for selecting of tax returns for auditing compared cut-off policy and random audit policy. Reinganum and Wilde (1985), through a simple model, showed that an audit cut-off policy is better than any random audit policy. Mookherjee and Png (1989), however, presented a model with sufficient conditions for random audits to be optimal. Pestieau et al. (2004), in a simple model, showed that government can significantly alter the tax audit results by adjusting the audit policy in response to the individuals' differences in risk preference and income. This paper draws attention to the frequency of performing a tax audit as an aspect of audit policy. Frequency refers to the number of times the AG audits the tax returns of a corporation.

This paper proposes that an increase in the number of times the AG audits the tax return of a corporation reduces the probability at which the AC of that corporation evades corporate income tax. This is so because the basic model established $\propto$ as one of the denominators in the AC's evasion probability $\frac{\delta}{\beta+\delta+\propto}$. And so, an increase in $\propto$, if β and δ remain constant, reduces the probability at which the AC evades corporate income tax. Even when performing a tax audit on a true return, the mere conducts of that audit negatively influence the decision of that AC to evade tax in the future. Further, the relationship between δ and $\frac{\delta}{\beta+\delta+\propto}$ suggests that if δ is high, then $\frac{\delta}{\beta+\delta+\propto}$ is high. This implies that failure to audit a forged return will motivate the AC to evade the income tax of their corporation. Therefore, Condition 2 is supported.

In order to ensure audit frequency, the audit policy must incorporate a set of audit frequency cut-off rules. Such rules may be based on the size of the corporation or the level of income or level of expenses or type of industry and so forth. For example, part of an audit frequency cut-off rules may be stated as: 'Every

corporation with a total assets or total expenses or total sales that exceed one billion at any point in time during the year are subject to no less than three audits in every five years; and those corporations with a total assets or total expenses or total sales below one billion are subject to no less than two audits in every four years. The time of audit shall be determined by the AG'. The validity of the cut-off policy and the importance of increasing the risk faced by the AC are supported by Reinganum and Wilde (1985) and Mookherjee and Png (1989).

Lack of independence as an evasion indicator

Although the lack of independence, segregation of duties and conflict of interests between parties within a corporation are the indicators commonly used by internal and external auditors to identify control weaknesses, mismanagements and fraud in a corporation (Chinese Institute of Certified Public Accountants, 2008), their inclusion in tax evasion modeling or application is lacking. This paper advocates that the AG should also use the same principles, in particular, the relationships between the AC and the Owner and/ or the Director, for identifying evasion. This suggestion is supported if $\frac{\mu_{ac}+\mu_o+\mu_d+\varepsilon}{\varphi_{ac}+\varphi_o+\varphi_d} > \frac{\mu_{ac}+\varepsilon}{\varphi_{ac}}$.

From Section 5:
$\mu_o + \mu_d > 0$
$\varphi_o + \varphi_d > 0$ and
$\mu_o + \mu_d > \varphi_o + \varphi_d$

Therefore, $\frac{\mu_{ac}+\mu_o+\mu_d+\varepsilon}{\varphi_{ac}+\varphi_o+\varphi_d} > \frac{\mu_{ac}+\varepsilon}{\varphi_{ac}}$ and Condition 3 is supported. Accordingly, the AG's tax audit probability should shift from $\frac{\mu_{ac}+\varepsilon}{\varphi_{ac}}$ to $\frac{\mu_{ac}+\mu_o+\mu_d+\varepsilon}{\varphi_{ac}+\varphi_o+\varphi_d}$ when independence between the AC and the Owner and/or the Director is deprived. Further, when the AC knows that the lack of independence, in actuality and in appearance, will subject the corporation to a higher probability of being audited by the AG, the AC who is in such dilemma will be motivated to lodge true returns.

Therefore, the basic model promotes the cut-off policy and recommends the inclusion of independence tests as part of the audit selection process.

Conclusion

Theoretical researches on corporate income tax evasion have been disadvantaged far too long by the incompatibility and limitations of the PIF, the PAF and the PTAF to represent fairly the dynamics of corporate income tax evasion. These behavior based frameworks emphasized the logic of evasion behaviors for predicting tax evasion and ignored the identification aspect of tax evasion. This paper argues that in order to enhance the theoretical contributions to the problem of corporate income tax evasion, it requires a framework that bridges the gap between the prediction aspect and the identification aspects of corporate income tax evasion. For this purpose, the paper offered the CFCITE.

The paper identifies four aspects of audit policy that will reduce corporate income tax evasion. First, the cut-off policy is recommended over the standard random audit policy. Second, there should be a reward program to encourage the capturing of tax evasion and discourage it practices. Third, cut-off policy should include rules to ensure the frequency of tax auditing. Fourth, audit policy should include an independence test to ensure that corporate characterized by lack of independence between governance and the AC are subjected to a higher audit probability than those corporations without such characteristics.

The paper makes several significant contributions to academic knowledge of corporate income tax evasion. First, the paper departs from the traditional consensus that the corporation is the evader of corporate income tax and reveals that the agent of a corporation is the real evader. Second, the paper adds the characteristics aspect of the parties as important elements to the study of corporate income tax evasion. Third, the paper adds the dynamics of relationships and environments as indicators of tax evasion. Fourth, the paper departs from the traditional behavior based approach and offers a contextual based approach for the study of corporate income tax evasion.

Future study may focus on improving the basic model by considering additional factors such as bribery.

REFERENCES

Adams D (2013). Florida hit by "tsunami" of tax identity fraud. Reuter. 12 February 2013. Viewed 5 April 2013, http://www.reuters.com/article/2013/02/17/us-usa-tax-fraud-idUSBRE91G05M20130217?irpc=932.

Allingham MG, Sandmo A (1972). Income tax evasion: A theoretical analysis. J. Public Econ. 1:323-338.

Amos H (2013). Russia losses £52bn a year in tax evasion and illegal transfers, says bank chief. Guardian. 21 February 2013. Viewed 5 April 2013, http://www.guardian.co.uk/world/2013/feb/21/russia-loses-52-billion-tax-evasion.

Arrow KJ (1970). Essays in the theory of risk-bearing. North-Holland, ch.3.

Becker GS (1968). Crime and punishment: An economic approach. J. Political Econ. 76:169-217.

BizFilings Toolkit (2013). Tax avoidance is legal: Tax evasion is criminal. Fact checked on 28 January 2013. Viewed 22 April 2013, http://www.bizfilings.com/toolkit/sbg/tax-info/fed-taxes/tax-avoidance-and-tax-evasion.aspx.

Chinese Institute of Certified Public Accountants (2008). China standards on auditing, review, other assurance, related services and quality control. Standards CICPA. Dalian Publishing House. People's Republic of China.

Daley S (2010). Greek wealth is everywhere but tax forms. New York Times. 1 May 2010. Viewed 5 April 2013, http://www.havocscope.com/tag/greece/page/2/.

Ferrell OC, Gresham LG, Fraedrich J (1989). A synthesis of ethical decision models for marketing. J. Macromarketing 9:55-64.

Friedman M (1970). The social responsibility of business is to increase its profits. New York Times Magazine. 32FF.

Fukofuka P (2013). The effects of the moral standards of Tonga on government auditors' moral choice behavior, Master thesis. China University of Technology, China.

Gino F, Pierce L (2009). The abundance effect: Unethical behavior in the presence of wealth. Organ. Behav. Hum. Decis. Processes 109(2):142-155.

Government of Tonga (2002). Revenue Services Administration Act 2002.Kingdom of Tonga.

Herman T (2006). Tax report: Legislations raises the rewards for tips uncovering big fraud. The Wall Street Journal, 20 December 2006. Viewed 19 June 2013, http://www.lopds.com/pressnews-articles/#Tax Report.

Jensen M, William M (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. J. Financ. Econ. 3:305-360.

Mookherjee D, Png I (1989). Optimal auditing, insurance and redistribution. Q. J. Econ. 104:399-415.

Mossin J (1968). Taxation and risk-taking: an expected utility approach. Economica 35:74-82.

Pestieau P, Possen UM, Slutsky S M (2004). Jointly optimal taxes and enforcement policies in response to tax evasion. J. Public Econ. Theory 6(4):337-374.

Reinganum JF, Wilde LL (1985). Income tax compliance in a principal-agent framework. J. Public Econ. 26:1-18.

Tax Whistleblower Law Firm (2013). Tax whistleblower reward program. Reward Tax.Com. Viewed 29 June 2013, http://www.rewardtax.com.

The IRS of the United States of America (2013). Whistleblower – informant award. IRS Update 10 June 2013. Viewed 19 June 2013, http://www.irs.gov/uac/Whistleblower-Informant-Award.

Travino LK (1986). Ethical decision making in organizations: A person-situation interactionist model. Acad. Manage. Rev. 11:601-617.

Tulkens H, Jacquemin A (1971). The cost of delinquency: a problem of optimal allocation of private and public expenditure. CORE. Discussion Paper 7133.

Wright O (2013). CPS launched crackdown on middle-class tax evaders. Independence. 22 January 2013. Viewed 5 April 2013, http://www.independent.co.uk/news/uk/home-news/cps-launches-crackdown-on-middleclass-tax-evaders-8460891.html.

Zhong CB, Strejcek B, Sivanathan N (2010). A clean self can render harsh moral judgment. J. Exp. Soc. Psychol. 46(5):859-862.