Computer Aided Tax Evasion Policy Analysis: Directed Search using Autonomous Agents

(Extended Abstract)

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ABSTRACT

Abusive tax shelters implemented through partnerships and S corporations have become increasingly popular amongst tax planners, helping high-income taxpayers to underreport an estimated $91 billion of income annually in the US alone. The most challenging problems for tax collection agencies in this respect are *a*) the recent upswing in large, tiered partnership structures and *b*) the evolving nature of tax evasion schemes in response to auditing policy.

By representing tax evasion schemes as sequences of financial transactions, we are able to conduct a directed combinatoric search that can find effective abusive tax shelters, given an initial ecosystem of taxable entities and their respective portfolios. Assigning auditing likelihoods to certain types of transactions allows us to consider policies that would result in increased compliance. We accomplish this by considering each tax plan and auditing policy as individual agents.

Categories and Subject Descriptors

M.2.5.1 [**Social and professional topics**]: Taxation

General Terms

Algorithms, Economics

Keywords

tax evasion, grammatical evolution, genetic algorithms, auditing policy, agent-based modeling

1. INTRODUCTION

The Government Accountability Office (GAO) estimates that roughly $91 billion of income is misreported by partnerships and S corporations annually [1]. These types of businesses are particularly attractive to tax planners because they are characterized as "flow-through" entities, meaning that the shareholders, not the corporation itself, are responsible for any tax liability that it takes on. Thus, auditing these entities can become extremely difficult for the IRS because it involves information regarding both the entity and each individual shareholder. With some of the largest partnerships containing upwards of $20,000$ partners [2], obfuscating taxable income can become commonplace. Additionally, many of the shareholders in these partnership structures are themselves other flow-through entities, adding an additional layer of complexity.

We focus primarily on tax evasion schemes that attempt to offset real gains in a taxpayer's portfolio by acquiring assets with a large built-in loss, or artificially stepping up the basis in previously owned assets. When the financial documents are filed, it appears as though the taxpayer incurred substantial losses, which can cancel out the income generating gains elsewhere in their portfolio. Generally, tax shelters that require the utilization of multiple partnerships are planned and implemented by professional *tax shelter promoters*.

Furthermore, whenever the IRS finds a strategy to successfully audit or disallow tax benefits from abusive tax shelters, a new tax shelter emerges that, while similar to the previous iteration, is undetectable by the IRS [7]. For example, when an IRS notice was issued that disallowed tax benefits gained from the Distressed Asset Debt (DAD) scheme, a new tax shelter quickly arose that was nearly identical, except made use of trusts rather than partnerships to disguise taxable gain. The sheer number of clauses within the Internal Revenue Code seem to allow tax shelter promoters to subtly permute citations or justifications to avoid IRS scrutiny.

Prior analytic models of tax evasion focus on macroeconomic parameters such as GDP growth or the tax rate that incentivize taxpayers to turn to tax shelter promoters [5]. While these models provide valuable insight into measures that Congress can take to mitigate abusive tax shelters, they provide no information that the IRS could use to improve their ability to detect abuses of the tax code and subsequently alter their policy directives.

Conversely, we take a microeconomic approach that focuses on the mechanics underlying the ability to evade tax. By treating transaction sequences as agents and calculating

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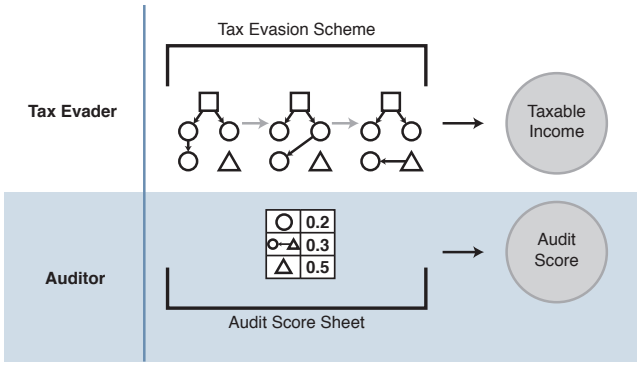

Figure 1: STEALTH Overview

the taxable income that they generate, we can determine the structure of the most effective schemes.

Furthermore, tax evasion schemes lend themselves well to computational representation because they are generally composed of multiple accounting rules that, while simple individually, can generate complex results [4]. Here we extend a previous attempt to model the human process of inventing tax evasion schemes and determining audit observables [6].

Complementing the generation of effective tax evasion schemes is our treatment of IRS policies. We assume that within the tax ecosystem, there exist a list of *observables* that policy-makers use to determine whether an audit should be conducted. Each agent is then a list of numerical weights, each associated with a different observable, that represents the relative likelihood that the observable is indicative of abusive behavior.

Our representation of auditing policy mirrors "IRS notices", that are the Internal Revenue Service's primary form of creating new policy. These notices usually describe a scenario that will result either in *a*) a disallowance of tax benefits or *b*) legal action. Typically, many aspects of an abusive tax shelter can be characterized by a list of events that compose such a scenario.

This method, which we refer to as **STEALTH**, allows us to construct policy suggestions by determining which combinations of indicators are highly correlated with large losses. The goal is to characterize classes of tax evasion schemes by the presence of a discrete set of observable features, which can be used to construct sensible policy.

This is accomplished through a three-step process. We first develop a *representation* of partnership taxation in order to accurately calculate taxable income, given a sequence of transactions. Next, we *simulate* the auditing process by recording which observable traits are present within a transaction sequence, and generating an audit score associated with a specific sequence-policy pair. Finally, we conduct a directed search over large populations of tax evasion schemes and auditing policies, using the taxable income and audit score generated from the simulation, and *optimize* to find the ideal tax evasion scheme and auditing policy for a given scenario.

2. DISCUSSION

A common anecdote regarding manipulation of the tax code involves the childhood "no backsies" rule.[1] The rule stipulates that if there is a line of children, then one can allow their friend to enter the line in front of, but not behind them. The moral justification for the rule is that if everyone in the line suffers from the extra wait time, then the child that let their friend cut in line should suffer as well. But this rule is easily evaded if, immediately upon letting their friend cut in front of them, the child exits the line. In turn, the child's friend allows them to legally cut in line in front of them, effectively engineering a "backsie" from two legal actions.

Essentially, the goal of professional tax shelter promoters is to find analogous engineering techniques within their jurisdiction's tax law. By separately representing multiple aspects of the tax law, we can construct tax plans that are composed specifically to generate favorable tax treatment for the involved parties without regard to the intent behind any of the individual statutes.

This approach can serve as a useful tool for policy-makers in order to understand how taxable income flows through complex partnership structures. Abstractly representing a complex system can be the most effective way to learn about it. Calculating taxable income through complex partnership structures falls into the category of *conceptual problems*, which lend themselves particularly well to learning through computer modeling [3].

Policy-makers, as well as tax professionals in private practice, could greatly benefit from the use of these computational techniques. Many implications of complex partnership structures are unknown, given the computational complexity involved in tax calculations. An agent-based modeling approach will allow policy-makers to determine what types of abusive behavior are possible within such structures. Additionally, the inclusion of audit likelihood in the tax plans' objective functions let policy-makers evaluate potential responses to changes in auditing policy.

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[1]Taken from a discussion with Ameek Ponda J.D., LL.M. of Sullivan & Worchester on October 28, 2014