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Reducing tax gap through compliance: the emergent patterns of tax evasion

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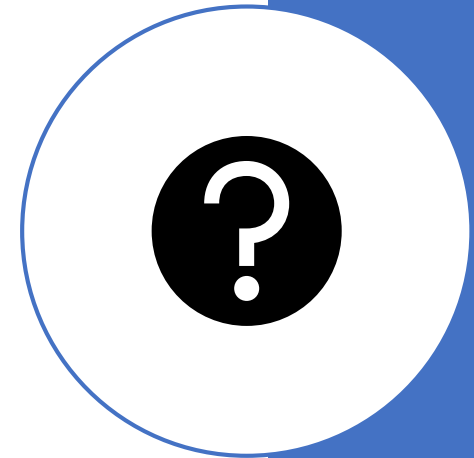


Introduction

- The tax gap is the difference between what is owed to a tax authority and what it is paid in timely order.
- Enforcing compliance is one of the key factors for reducing the tax gap in economies
- How? through individual inspections taken out by the tax authority that create the fear of being caught and stir away the non-compliance thoughts



- What is the ideal rate of inspections for a given tax or group of taxpayers?!
- Who should be targeted?!
- How do relations between taxpayers in the social environment influence the level of compliance?!
- Is there an emergent pattern that can help the tax authority catch the tax evaders?!



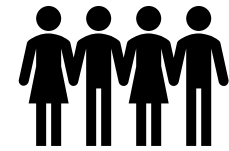
Non-compliance

- The opportunity for non-compliance happens when there is the need to self-report income.
- The rate of inspections is low
- Probability of being caught is also low
- The fines are not that high



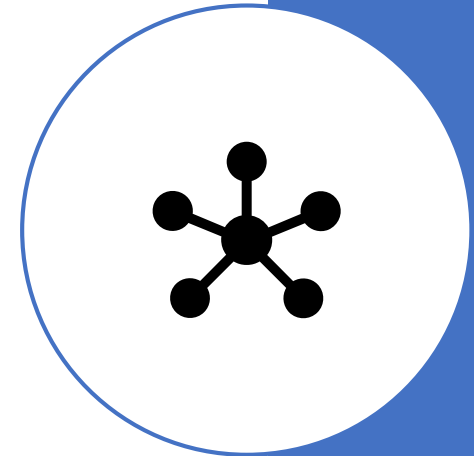
Social Network

- The social network plays a great role in the taxpayer's choice to evade
- They tend to converge to the average behavior of the society
- The social influence generates a contagion pattern



Agent-based Models

- Agent-based models have enabled researchers that do not have programming skills to develop models of real-world systems
- Models are computer simulations that allow agents, that are previously parameterized, to interact with one and other
- That mimics the real-world system and lets explore the dynamics and underlining mechanistic behavior of a complex system



SIMULFIS

by José A. Noguera, F. J. Miguel, Eduardo Tapia and Toni Llácer

Agent-based model that considers rational choice, fairness concerns and normative beliefs that riles on a random or homophilic social network that is set in an environment where a central tax authority implements a fiscal regulation, collects taxes, executes audits and fines, and distribute tax revenues through a social benefit;

Allows to analyze four behavioral scenarios, a strict rational choice, a rational choice supplemented by normative of fairness concerns, a rational choice supplemented by social influence in the form of a social contagion mechanism and a scenario where all of the above are combined.

Genetic Algorithms

by Geoffrey Warner, Sanith Wijesinghe, Uma Marques, Osama Badar Jacob Rosen, Erik Hemberg and Una-May O'Reilly

Genetic algorithms are metaheuristics inspired by Darwin evolution that can be applied to optimization problems;

There basic mathematical structure is like a bit string that combined form chromosomes which are subject to some type of genetic variation introduced through a genetic operator and reproduce other chromosomes;

Concentrate on tax evasion schemes, they have the same underlying formal structure and can be reduced to pairwise transactions sequences between distinct financial entities;

Then the schemes that result in less taxes are taken in to consideration as potential tax evasion schemes.

Improving tax administration services and perceptions

- Great relevance public state budget
- Compliance program should be structured around major taxpayer segments
- Function based organization that groups core functions and tackles all types of taxes
- Conflicting finding that delayed feedback on tax audits results in higher tax compliance although associated with lower tax morale



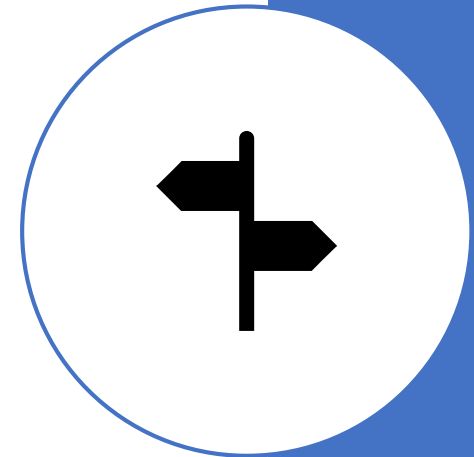
Other ways to measure tax evasion

- A method that is based on the credit products, as loans, mortgages, and overdraft facilities
- Entities that lend money tend to adapt their risk assessment to the true level of income of the individual



The future of the tax gap

- Digital transactions which enrich third party
- Credit cards, debit cards or even smartphones
- Computational power and storage capacity
- Most of the workforce is employed by large enterprises



Conclusion

- It is possible to tackle the tax gap problem through various methods of interest as agent-based models and genetic algorithms

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