## Income Tax Evasion and Ethical Behavior – Evidence from an Agent-based Model

by

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## **Extended** Abstract:

In this paper we analyze the evolution and extent of income tax evasion under alternative governmental policies in an agent-based model with heterogeneous agents.

Agents are heterogeneous with respect to the income they earn and the behavior they show. In particular, we consider four different agent types: *a-types*, who always show an expected utility maximizing behavior in line with the Allingham and Sandmo model; *b-types* who show an imitative behavior pattern in the sense that they copy the dominant behavior pattern shown within their social network, that is, if tax compliance prevails they also comply, but if tax evasion prevails they also evade taxes; *c-types* who strictly follow certain behavioral norms (Kantian behavior, patriotism, etc.) and, therefore, always declare their true income, and finally *d-types*, who also wish to declare their true income, but may make mistakes within an epsilon environment around their true income, for example, because of the complexities of the tax law. The exact proportion of these different types within the population is a parameter of the model, which can be freely selected.

Within this framework we then simulate the impact of alternative governmental policies in two steps. First, we analyze policies such as changes in the income tax rate, changes of the income tax tariff structure, changes in tax law complexity, changes in the income distribution within the population, and changes in tax law enforcement policies (higher penalties or audit probabilities or both) under *ceteris paribus* conditions. Next, we analyze package changes of these policies, that is, the simultaneous change of two or more of these policies in intervals of four or five periods to simulate political cycles.

Among many other things, the model allows us to demonstrate that the evolution and the extent of income tax evasion depends, *ceteris paribus*, on the communication structure and the type distribution within the population. In particular, we demonstrate that a certain share of c-types in combination with a suitable communication structure among agents is helpful in preventing the spread of tax evasion within the population. To this extent the model shows that combating income tax evasion may to some extent be achieved via ethical education and similar means that lead to an increase of c-types in the population.

On the technical side we use the software packages MATLAB and PePAST for programming the model.

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