

# **A NEW APPROACH ON TAX EVASION ANALYSIS USING ABM: CASE OF ALBANIA**

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# **A NEW APPROACH ON TAX EVASION ANALYSIS USING ABM: CASE OF ALBANIA**

By

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## **DEDICATION**

I am grateful to my family and my dearest friends, for their love, support and precious presence each day of my life!

## **ABSTRACT**

### **Faculty of Economics and Administrative Sciences**

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Tax evasion is in reality a very serious problem not only for developing countries which are still undergoing the transition phase, but also to countries that have a very strong and developed tax system.

Extensive literature and research has been made in this matter for a long time, while the perspectives and the tools used to study tax evasion has evolved greatly.

Starting from rational theories where tax payers' decision was made purely on their economic utility, the psychological factors that influence these decision makers were deeply analyzed beginning in the 1970s.

However, benefiting from the advances in programming frameworks, economists used the new agent based modelling techniques to design models, test their theories and using data to simulate situations as close to real economic and complex tax systems as possible.

In the developing Albanian economy, tax evasion is one of the primary concerns that policymakers are continuously trying to minimize through different methods.

Therefore, introducing agent based modeling as a very effective way to study economic situations and predict the effects of controlling measures before applying them to economy, would be a significant contribution to Albania's development.

**Keywords: tax evasion, tax compliance, agent based modelling**

## **ABSTRAKT**

### **Fakulteti i Ekonomisë dhe Shkencave Administrative**

Udhëheqës: Igli Hakrama

Evazioni fiskal është në ditët tona një problem shumë serioz jo vetëm për vendet në zhvillim që po kalojnë fazë tranzicioni por edhe për vendet të cilat kanë një system tatimor të zhvilluar e të konsoliduar. Një literaturë shumë e zgjeruar dhe kërkime të shumta janë bërë për këtë çështje prej një kohe të gjatë. Nderkohe pikëpamjet dhe metodat e përdorura për të studiuar evazionin fiskal kanë evoluar shumë. Duke filluar nga teoritë racionale sipas të cilave vendimet e taksapaguesve merren vetëm në bazë të përfitimit të tyre ekonomik, faktorët psikologjikë që influencojnë vendimarrësit filluan të analizohen në vitet 1970.

Per me teper, duke shfrytëzuar zhvillimet në strukturat e programimit, ekonomistët përdorën teknikat e reja të modelimit të bazuar në agjentë për të nderuar modele të tjera, të testonin njohuritë e tyre duke përdorur shifra e të dhëna për të simuluar situata që janë sa më të ngjashme kompleksitetit real të sistemeve fiskale.

Në ekonominë shqiptare ende në zhvillim, evazioni fiskal është një nga shqetësimet kryesore të qeveritarëve të cilët përpiqen vazhdimisht për ta minimizuar përmes politikave të ndryshme. Prandaj përdorimi i modelimit të bazuar në agjentë si një mënyrë efektive për të studiuar situatat ekonomike dhe për të parashikuar efektet e masave kontrolluese përpara aplikimit në ekonomi, do të ishte një kontribut themelor për zhvillimin e Shqipërisë.

**Fjale Kyçe: evazion fiskal, modelim i bazuar ne agjente**

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Most importantly, I truly appreciate for his guidance and encouragement while researching and writing my thesis.

## **DECLARATION STATEMENT**

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Epoka University or other institutions.

Xheni Haka

June 2015

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## **LIST OF ABBREVIATIONS**

ABM – Agent Based Modeling

EU – Expected Utility

GP – Gambler’s Fallacy

BCE – Bomb Crater Effect

SBTCS - Small Business Tax Compliance Simulator

VAT – value added tax

## CHAPTER 1

### INTRODUCTION

Every country operating in free market economy needs to focus on its income level in order to stabilize its economic growth. This goal can be achieved by an effective implementation of fiscal policy instruments by the government or central bank. The main problem that the authorities face in this field is tax evasion.

This phenomenon happens when individuals or businesses that are subject of different tax payments, do not comply their economic and legal obligations of paying taxes to the government, either by partially or completely hiding their income level or other taxable source. Given the high importance of tax collection in macroeconomic development, economists have been studying tax evasion and its complex mechanisms for a very long time.

Using the traditional mathematical models of expected utility to explain tax evasion was a satisfactory method to describe a society where individuals take rational economic decisions when calculating whether or not to pay their taxes. However, real economic data did not match the results given by model, because there were other factors beyond people rationality choices that affected the tax compliance.

The factors that determine the tax compliance behavior of tax payers in a society are of economic and non-economic nature. Factors such as their income level, the probability of being controlled by the authorities, the tax rate, penalties and fines belong to the first group. Additionally, people's personal attitude toward taxes, honesty, trust, social imitation, reputation and whether they perceive the tax system to be fair are factors which economists have been able to further analyze through the means of agent based modeling.

Agent Based Modeling is an increasingly popular approach used by researchers of all scientific fields which enables them, through programming tools, to simulate real life behavior of individual entities and their interaction to provide more accurate results, representing closely the real data.

In a country going through a transition period such as Albania, tax evasion is one of the main problems that reflect the economic situation and development. Therefore, analyzing and understanding the causes and effects of this phenomenon would lead to the planning and implementation of more effective fiscal policies by the government in order to achieve its long term economic goals.

In this thesis, it is given a detailed description of traditional models explaining tax evasion followed by the advantages of new research methods. Agent Based Modeling is described in a more practical way by comparing a few of different programming tools. Finally, a general overview of the Albanian tax system and legislation is presented and concluding with suggestions on possible changes in order to increase the efficiency of fiscal policies and decrease the tax evasion.

## CHAPTER 2

### LITERATURE REVIEW

Tax evasion, or the other side of the medal, tax compliance has always been a concern for tax policy makers and a country's society in general. This is a result of the effects that tax compliance has on the collection of revenues and the ability that the government shows in achieving fiscal goals of its economic planning. Therefore, the aim of tax reform is to be able to achieve higher voluntary compliance of all economic entities operating within an economy frame: individuals, small businesses and corporates.

The first economic research on tax appliance behavior has been analyzed by Allingham and Sadmo (1972), taken from evasion perspective of the economic actors. Their neoclassical approach is also supported by Srinivasan (1973) and Yitzhaki (1974) which explain the degree of tax evasion by factors of system control and penalties in order to calculate the expected costs and benefits of tax evasion behavior. Their economic model can be expressed in the following mathematical form:

$$EU = (1 - p)(y - tx)^\alpha + p[y - ty - \phi(ty - tx)]^\alpha. \quad (1)$$

Equation (1) defines a tax payer's expected utility (EU) when calculating and making the decision of reporting an income level of  $X$  dollars, which will be subject of the income tax. This relationship is a function of: the probability  $P$  of being detected by an auditing authority,  $t$  as the marginal tax rate,  $y$  as the total income that is a taxable during the year,  $\Phi$  the punishment rate for every dollar that is not reported and  $\alpha$  as the coefficient of the tax payer to measure the relative risk aversion (Bloomquist 2011).

Simply, the model can be interpreted as follows: if the individual is not audited ( $1-p$ ), then her utility is defined by income ( $y-tx$ ) because  $tx$  is amount of the income that she has reported to authorities. However, if the individual is subject of an auditing ( $p$ ), he/she must pay all the tax liabilities ( $ty$ ) additionally to the penalty for the unreported amount ( $ty-tx$ ).

The most significant conclusion we can draw from the model is the case of risk neutral tax payer ( $\alpha=1$ ) which after some transformation shows that:

$$p < \frac{1}{1 + \phi}$$

When interpreted economically, this expression states that risk neutral tax payer should be expected to report zero income if the probability of audit by authorities is less than the ratio on the right side.

This situation immediately caused the first disagreement of the model with real economic facts. In the United States the audit rate is about 0.01 which according to the model would mean that even if tax payers reported zero taxable income every year, they would still enjoy a total increased income. However, this contradicts the real data that shows that the tax payment level paid voluntarily by the tax payers ranged by 85% through the years 1970-1980 (Bloomquist 2005).

Such a difference would have anyone wonder the accuracy of rational choices and the other causes that the model could have had possibly neglected. Therefore, we conclude that the rational choice theory is useful because it can partially explain the tax payers'

decisions but it is not accurate since it fails to include other non-economic factors that influence at almost the same extent the decision for tax compliance or evasion.

### *Non-economic factors analysis*

Beginning from the late 1970 researchers started to think of and design new experiments and psychological methods to study different behavior of individuals, where the most significant one to be mentioned is “Prospect Theory” (Tversky and Kahneman, 1979). These psychologists insisted in explaining through numerous situations that the human being is mostly irrational. The irrationality that people show in different life situations follows consistent patterns and can be grouped in types of logical fallacies. These new developments allowed for a new area of research in fields which had originally assumed a purely rational decision-maker, especially in the economic perspective.

In the following studies, the psychological aspects on the tax evasion problem have been analyzed. Thibaut et al. (1997) gave the conclusion from their empirical observations that the perceived fairness of the rules of the tax system highly influence the degree of compliance with the rules of tax declaration. On the same factor was based the study through new experiments of Spicer and Lee Baker (1980) who designed a game between the participants in which they had to make decisions in different hypothetical tax situations and their inclusion in tax evasion behavior was later analyzed. The results showed that on average, the percentage of evasion rate was higher at the group of the participants who were given the information that they were actually paying taxes in a rate that was higher than the average of the whole group of participants. In other words, if any taxpayer notices that they are paying all taxes while others are not complying with their tax obligations, they will be discouraged to pay the taxes in the future periods.

Therefore it can be said that information disclosure has an effect when revealing comparative levels of tax rate. Taking this conclusion in further consideration, Baldry (1985) used another psychological mechanism to investigate information effects if the tax declarations of the subjects were made public. His experimental design was close to the situation of real world and the results were that evasion would increase if the tax declaration of everyone were kept private and it would decrease if the government made public and available to all other subjects their real tax declaration.

As studies continued, another psychological factor was discovered during the experiment of Alm et al. (1992). They considered what effect would have on the tax payers if they were introduced the importance of their taxes in investing for a public good, which all would benefit from. This research found that if the government defines public programs to raise people awareness of the benefits that their tax payment brings about, it may be a good strategy to generate greater tax compliance among the taxpayers since they would feel a sense of responsibility towards society and also consider it as a moral reward of their compliance.

Accordingly, it is clear that a knowledgeable tax payer is a crucial actor in the economy because if they are aware of their responsibilities to declare and submit correct tax income, the situations that could lead to unintentional tax evasion would be avoided. In this context, the government role is crucial in assuring that the tax system is not complex, but simple and clear with less ambiguity. This would help tax payers not to get confused or deter them from complying legal tax obligations. Researchers (Long & Swingen 1997) have identified six main areas that could potentially increase the complexity of a taxation system such as:

1. Ambiguity in the laws description
2. Difficult financial computation to make
3. Frequent changes in tax laws
4. Non consistent instructions (numerous rules and more exceptions to those rules)
5. Detailed records are required to be kept
6. The format of documentation to declare taxes is exhausting or confusing.

The closer the system is to these standard requirements, the more efficient will the authorities be in collecting the taxes from businesses and individuals.

A final research among many others worthy to be mentioned comes from Bosco and Mittone (1997). They designed an extended framework of repeated experiments with subtle changes in the factors they aimed to explore. Then, a random sample of individuals were tested through these experiments where they had to make choices about the amount of income they were willing to declare and the amount of tax they would plan to pay. The experiments were made through a simulated computer game and each time period they were given additional information on the screen. The focus of their study was to identify at which extend risk evaluation factors intersect with the psychological cost in the decision of tax payers to evade or to comply with tax obligations. They found out that the subject choices were dynamic. The results were very difficult to explain using only the traditional theory of a tax payer expected utility function rather than individual subjective expectations. Two most interesting observations were made:

1. There are different patterns of behaviors among the groups of individuals toward tax evasion.

2. A continuous and frequent auditing from tax authorities would decrease the propensity to evade in the long term.

A very strong explanation seemed to be found finally to complete the missing connection between very low tax compliance levels predicted by the models and the much higher rates in reality. Psychology and the experiments found out the important role of the individuals' misperceptions on probabilities which basically means that they tend to overestimate the chances of being audited. Nevertheless, this situation has its own complications too. After a series of taxing periods, individuals learn and modify their behavior accordingly. One surprising result was the phenomenon which the researchers refer to as the "Bomb Crater Effect" (BCE). The situations results when subjects decide to skip their taxes immediately after a fiscal audit since they refuse to believe that the control will happen twice in the same place and time. At first description, this can seem to be consistent with the "Gambler Fallacy" (GF), a commonly known phenomenon on people's misperception of probability to an uncertain event. However, in the BCE case subjects tend to change their pattern of behavior very often and not exactly as predicted by GF theory.

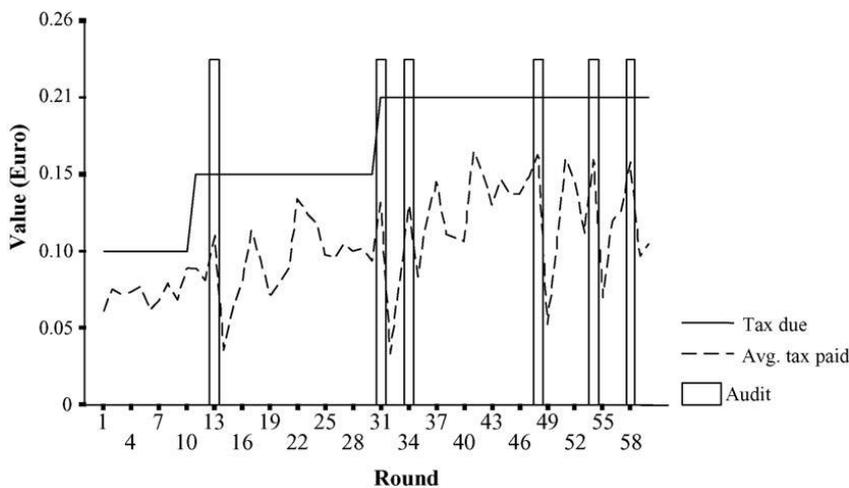


Fig.1. BCE unpredictable pattern

As the graph on figure 1, plotted from the Mittone results of experiments, shows that individuals tend to lower their payment to taxes for the periods immediately after they have been audited, but they do not continue to follow this pattern for a long time. In this case, it could be concluded that increasing the frequency of the auditing campaigns undertaken by the tax authorities, would have an effect in the predictability of tax compliance by the economic subjects.

## CHAPTER 3

### AGENT BASED MODELLING

The traditional method of looking at problems is by formulating a model and trying to represent the real system in a simplified way. Getting to the right model for our object of study requires going through the tasks of the modeling cycle several times while improving the models complexity or simplicity. Grimm and Railsback (2005) have done a great work in formalizing the modeling cycle.

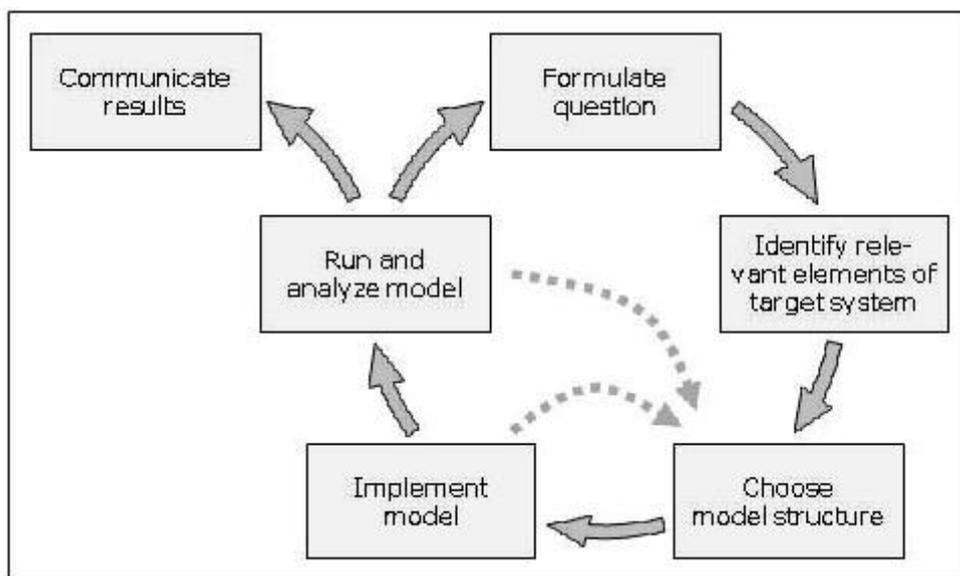


Fig.2. The modelling cycle, Grim and Railsback

The disadvantage of scientific modeling is that they are often limited by complex mathematical computation. With the evolution of computer simulation, agent-based modeling was a new approach which offered genuine perspectives to look at old models and study new ones which could not be represented accurately before. The main

advantage of ABMs is that instead of having a system with variables to show its state, now we can model through the individual agents that are unique and interactive.

Being unique and autonomous means that agents have different characteristics from each other and they adapt their behaviors in their environment to pursue their own objectives independently. Interacting agents refers to the ability of stimulating a behavior in which they are aware of the state of their neighbor agents that affect their decision.

The ease of formulating an ABM combined with the advantage of accurate results has had a great influence in the increased number of ABM simulation for research in a large number of fields. This rapid growth is moved forward by the evolution in the strategies of scientific ABM research and most importantly by the increase in quality of a number of a software platform specifically designed to address agent-based simulation.

The ABM platforms explained in this chapter have in common the structure in which they are based on. They all include their own set of concepts to enable designing of ABM and a library of software that provides the simulation tools.

According to Railsback, this “framework and library” paradigm has made these tools successful to a large extent because it is a standardization that does not limit the complexity of the models but yet they can be improved in some aspects.

For example, agents in an ABM system often need to complete full life cycle (creation and death). Nevertheless, the behavior that agents perform can be scheduled at different times and in different hierarchical orders. To simulate independent and unpredictable behavior, scientists designing the model use stochastic processes. There are many cases though when the decision-making of agents often needs to be goal-oriented in order to approach the reality of the phenomenon under study.

There are four software platforms that are mostly used for scientific agent based models. NetLogo is highly recommended because it provides a simple and still very useful programming language, with easy-to-use graphical interfaces and a very extensive documentation. However, different researchers prefer the other platforms too for a variety of reasons as described in the following paragraphs.

*Java Swarm* is the framework that was built with the aim of accessing the Objective-C library of Swarm through the use of Java programming and making minimal changes in the process. The initiative to build *Java Swarm* was created by the increasing demand of swarm programmers. They required a new system to enable them modeling in java with the efficiency of improvement in capabilities not being the main objectives. Therefore java Swarm is a really good platform that allows conversion of the programmers messages from java to the inside Objective-C library, taking advantage of the strong typing of the build in structure in java.

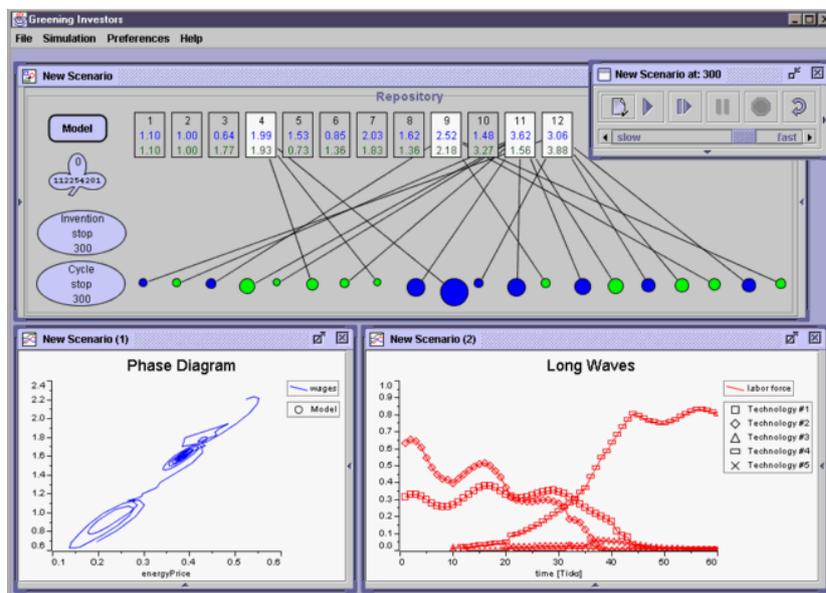


Fig.3. An example of JavaSwarm model interface

*Repast* is another ABM platform which has developed from a number of motives. Initially it was aimed to implement the equivalent of swarm functions in Java. However, *Repast* did not implement the Swarm design, therefore it initiated a new structure. The research fields that *Repast* was aiming to support specifically were the social sciences and it has continuously adjusted the tools for this domain purposely. *Repast* programmers have had a high consideration for users unfamiliar with model building. They have used different approaches to help them design and implement an ABM in this platform. Users may decide to start their model by importing code in Python programming language or using easy and intuitive interfaces to build their model or modify existing ones from *Repast* library.

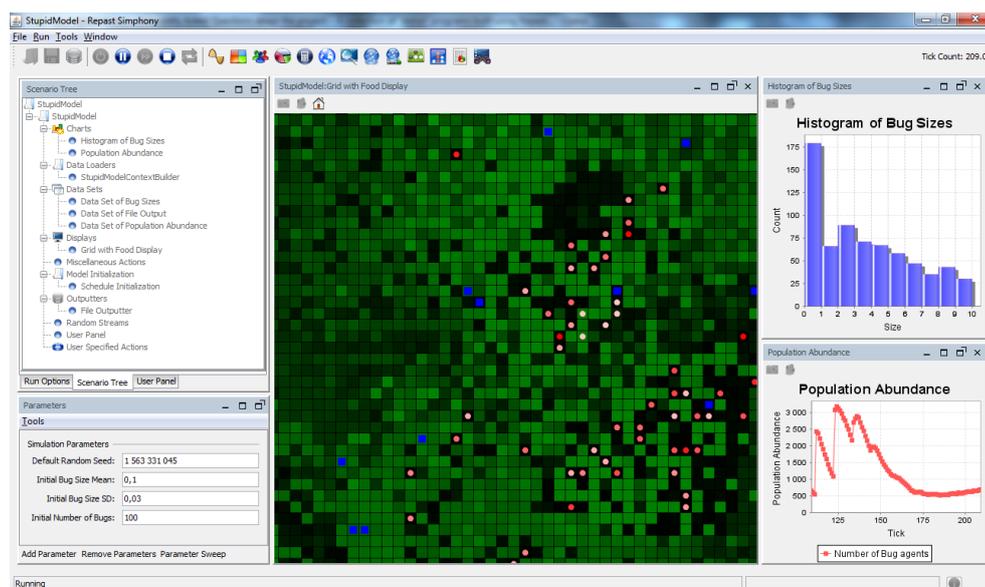


Fig.4. An example of Repast model interface

*MASON* is the platform intended to provide improvements in size and efficiency of Repast implementation. This was caused by the necessity of having models which demanded computations of many agents and a large number of iterations of processes.

Another objective when designing MASON was to make the models able to be reproduced across different computers hardware and still maximize the speed when executing. It is more common ability than special requirement for an ABM platform to detach graphical interfaces and moving the simulation among computers especially if it is a long simulation. The developers of MASON have intended to use it not for specific domain only but of general coverage. Therefore MASON could be considered as the least developed platform so far because its graphic interface is very basic and functions to randomize the number distributions are still being implemented into it.

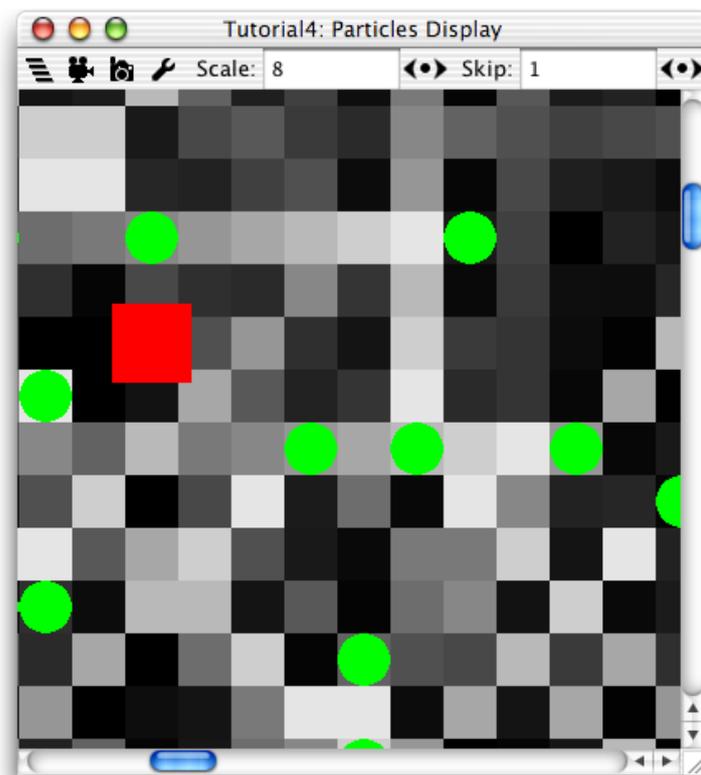


Fig.5. An ABM modeled in MASON

*NetLogo* is the platform which has the primary objective of being learning tool for instructors and students wishing to research further into the agent based modeling. The ease of use of the interface and the programming language are the main advantages of using NetLogo for ABMs. Since it includes a large library and extensive documentation its programming language can reduce the time spent programming the model because it contains many high level structures and primitives. For beginner modelers, NetLogo seems to be designed for a model where the agents interact on a grid space and the behavior is compiled in iterations over short times. It is true that such models are particularly easy to design in NetLogo. However the platform can be used to include models of other types too, making it the most professional platform so far.

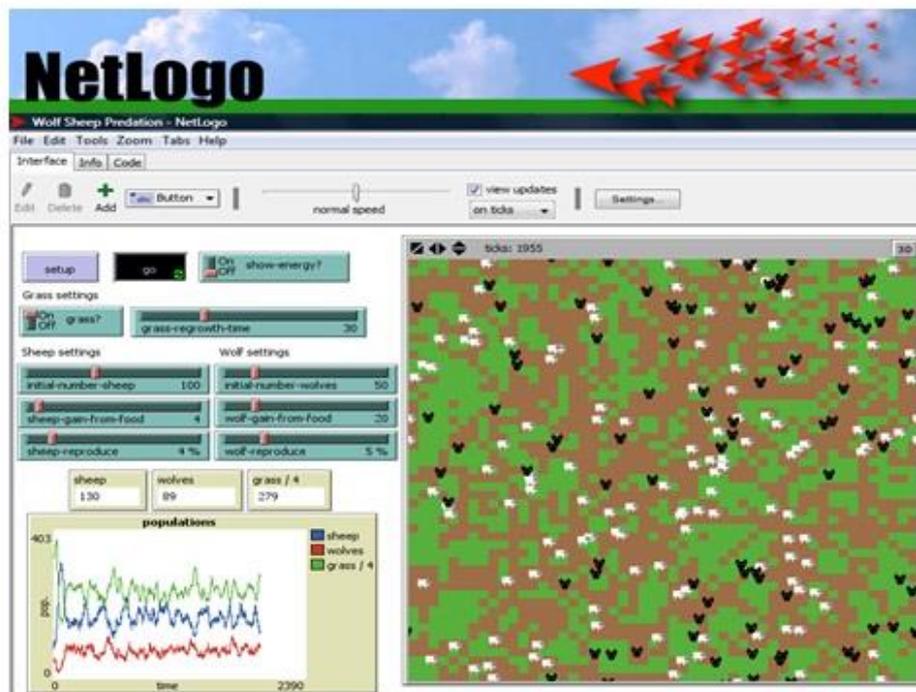


Fig .6. An ABM using NetLogo

## CHAPTER 4

### COMPARING TAX EVASION MODELS

The benefits of agent based modeling and design would be very soon put in practical use by economists studying the complexity of tax evasion. Especially this new field of research is following the agent based simulation approach to analyze the effects that a more enforced system of increased control and penalties would influence the compliance behavior of tax payers now interacting together.

*Mitton and Patelli (2000)* were among the first to build an agent based model. Their model represented three different types of agents: Totally honest, imitative and free rider tax payers. An honest tax payer always conforms to the right amount of tax obligations as he is always encouraged by the idea of social norm of compliance. Imitative tax payers are predicted to pay what other agents are paying on average, while free riders will aim to gain more by paying as little taxes as possible. This model showed that in a society with a considerable number of initially tax payers, an almost total evasion state would be expected over some time periods if there are little measures of law enforcements and penalties.

A more in-depth exploration of the topic is made by the model of *Davis et al (2003)*. Agents in their model only have knowledge about the enforcement levels and severity based on their perceptions and by observing the behavior of neighboring agents. In this case a tax authority will only have the role of preventing evasion at large spreading scale, but would do little to increase the existing compliance level.

In the model of *Korobow et al. (2007)* agents may report all or partially their income. They select their strategy with the highest expected profit. However, agents are heterogeneous with respect to the perceived chance of being audited. An agent seeks to infer this probability by observing his local neighborhood. All agents are placed on a lattice and a Moore neighborhood structure is assumed (that is each agents has eight surrounding neighbors). In addition agents are heterogeneous with respect to the perceived risk of apprehension. A very important finding of their research is that society may be highly compliant with low levels of tax enforcement most of the time but also that noncompliant activity may spread in an epidemic-like fashion, undoing a seemingly stable highly compliant equilibrium.

*Hokamp and Pickhardt (2010)* analyze evolution of income tax evasion under alternative tax policies in an agent-based model with heterogeneous agents. Their paper categorizes taxpayers as utilitarian, imitative, moralist and random, and the findings assert that ethical norms and lapse of time effects reduce the extent of tax evasion particularly strongly.

*Bloomquist (2011)* designs an agent-based model of small business taxpayer reporting compliance based on agent-based evolutionary coordination model, and defines taxpayers as honest, strategic, defiant and random. Simulation results show that after several time periods the initial number of honest taxpayers declines and the number of both defiant and strategic taxpayers increases. His research and experiments also assert that neighbors' behavior is not a key factor on compliance behavior of taxpayers in the real world.

### *Econophysics models on tax evasion*

A second group of agent-based tax evasion models has come from econophysics, a relatively new field of physics.

Zaklan et al. (2009) have employed agent-based tax evasion models that based on Ising model which is a mathematical model of ferromagnetism, developed by the physicist Ernst Ising in 1925. Ising model is used to imitate cooperation among agents in agent-based modeling of tax evasion, and shows that tax evasion may be restricted by using punishment as an enforcement mechanism. In addition to this conclusion which is also common for nearly all agent-based models, Ising model has an exogenous (independent) variable as “temperature” that concurrently effects all agents. Considering that individuals are likely to be influenced in their decision to evade taxes by their immediate neighbors, it was found that regardless of how strong group influence may be, enforcement always works to enhance tax compliance. Both, a higher probability of an audit and a larger punishment work together to enhance tax compliance. To exhaust the model’s explanatory power regarding how group influence affects overall compliance, it appears interesting to perform a similar analysis for different initializations (e.g. everybody is dishonest in the beginning), or where public opinion has an overall effect in one or the other direction. Also, it seems interesting to consider if and under what circumstances the system may show large fluctuations in tax compliance and whether these effects can be controlled, with the aim of fixing compliance at a high level.

Antunes et al. (2007) and Hokamp and Pickhardt (2010) both consider a model with different behavioral types of which one type more or less complies with a rational tax payer of the Allingham and Sandmo. The group of authors then considers income tax

evasion dynamics that results from alternative governmental policies and also include lapse of time effects (back auditing).

In particular, Hokamp and Pickhardt (2010) study the time-dependent tax evasion of the multi-agent society upon governmental tax policy changes at some given time steps. They find that the increase of the lapse of time period substantially reduces the extent of tax evasion, even at low audit rates. On the other hand, the model of Antunes et al. (2007) achieves high compliance behavior by introducing tax enforcers as a new type of agent so that an audit depends on individual decisions.

In another model by Crokidakis (2012) the tax evasion dynamics by means of a three-state agent-based model. The agents interact by pairs considering kinetic exchanges of their states, in a way that the pairwise couplings may be positive or negative. In addition, the punishment rules of the Zaklan econophysics model are applied. The results suggest that above the critical point of the opinion dynamics the tax evasion can be considerably reduced by the enforcement rules. On the other hand, below the critical point the compliance is high, and the punishment rules have a small impact on the evasion.

Yet, despite differences on the analysis an interesting aspect is that on the aggregate level econophysics models may mimic results obtained by economics models and that both model types may lead to stable equilibrium situations (steady states), which are characterized by a prevailing positive rate of tax evasion. Essentially, this implies that the results of individual rational behavior patterns may be reconstructed at the macro or aggregate level by means of natural stochastic processes such as statistical mechanics. In addition, econophysics models generate some interesting policy conclusions. For

example, Zaklan et al. (2008) find that even very small levels of enforcement are sufficient to establish almost full tax compliance and conclude that regardless of how strong group influence may be, enforcement always works to enhance tax compliance. However, in both cases the adjustment process may take a very long time. Seibold and Pickhardt (2013) have made an effort to overcome the lack of individualism by adding endogenous penalties and back auditing.

#### *Application of a tax evasion ABM*

Using models to describe real tax evasion causes and effects in the case of Albania economy was inspired by the work of Arslan and İcan (2013). They put into use the Bloomquist agent-based tax compliance simulator to model for Turkey and the auditing data there. In this model, four kinds of agent archetypes as honest, strategic, defiant, and random are employed.

They study four tax compliance scenarios:

- (a) both neighborhood effect and perceived auditing effect ‘off’ positions
- (b) neighborhood effect ‘off’ and perceived auditing effect ‘on’ positions
- (c) both neighborhood effect and perceived auditing effect ‘on’ positions
- (d) neighborhood effect ‘on’ and perceived auditing effect ‘off’ positions.

The model is used for simulating evolutionary changes in tax compliance behavior of a population of 10,000 taxpayer agents. The implementation of the model via four simulation scenarios points out that an agent-based evolutionary strategy simulation for Turkish case is valid. Also, the neighborhood effect is not found to be a determining factor.

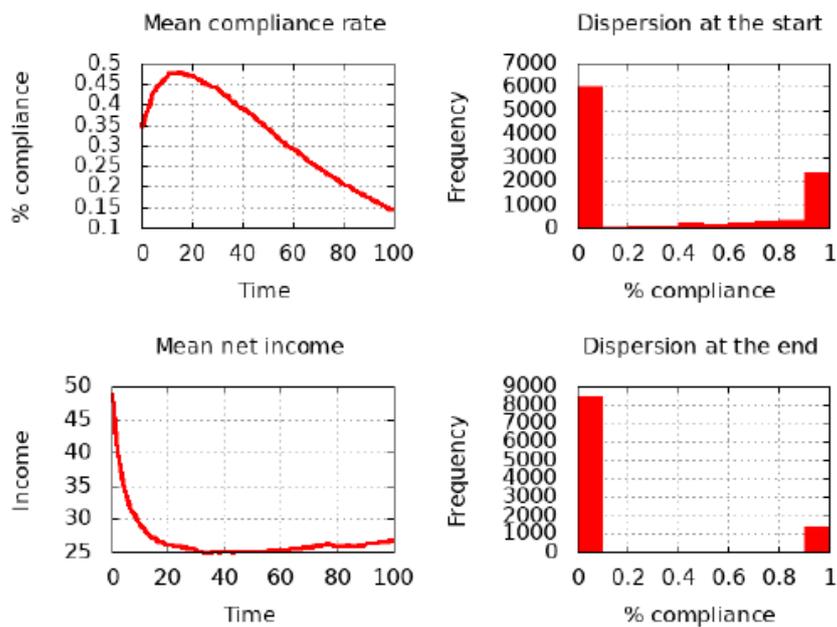
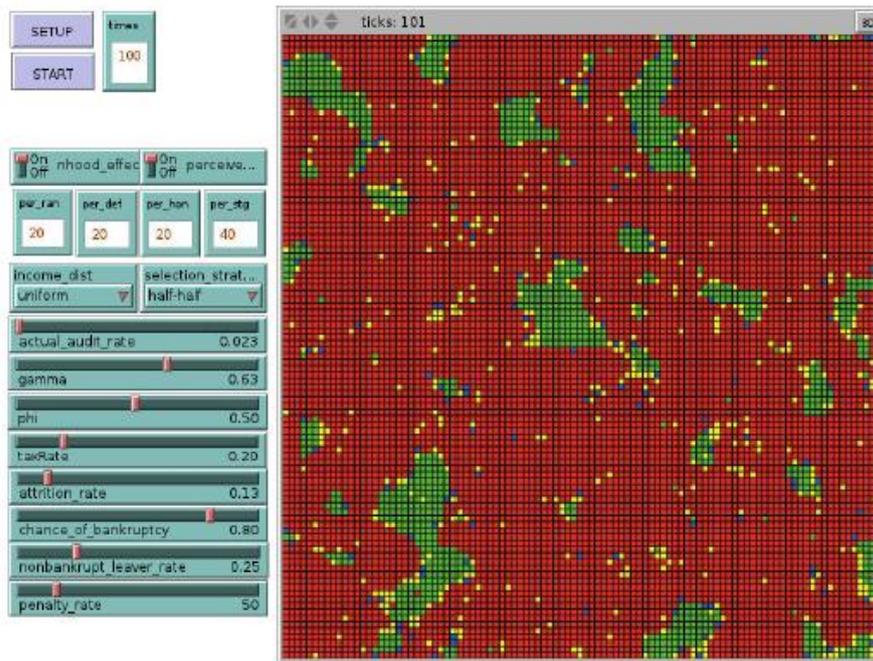


Fig.7. Results from implementation of Turkish data, third scenario

In the next chapter, the tax system of Albanian economy is described while pointing out the factors that conform much of the studied economic theories analyzed so far in this work.

## CHAPTER 5

### TAX SYSTEM IN ALBANIA

Tax evasion is in reality a very serious problem not only for developing countries which are still undergoing transition phase, but also to countries that have a very strong and developed tax system.

Albania as a country embracing the free market economy since '92 has seen a necessity to grow the level of income to make sure that problems of economic equilibrium will be stable and thus leading to the ultimate goal of overall economic growth. When designing the tax system and when implementing fiscal policies, the authorities have to take into consideration the tax payers behavior and their tendency to evade taxes. The tax control is one of the most common means that the government has in order to slow down tax evasion together with additional policies to minimize this phenomenon.

The tax system of every country include all the types of taxes that are obligatory by juridical and administrative legislation which describe the necessary mechanisms to describe, calculate, accumulate in the short and long run the overall level of taxes. So the tax system includes:

- Legislation on all kinds of taxes
- Rules and instructions of calculating and accumulating taxes
- Different types of taxes applied on different business entities
- Responsibilities of authorities and institutions part of the taxation policies

The types of taxes applicable in Albania are:

*Taxes on economic entities* where the taxable basis could be the factors of production or results of production. This way the society can regulate an equal distribution on the tax obligation.

*Taxes on personal income* constitute the most important element of modern financial systems. The government budget collects considerable revenues from this type of tax because of the high number of contributors and the progressivity of the tariffs.

*Taxes on small business* which include an aggregate number of taxes including the tax on VAT, social contributions and custom taxes on imports and exports.

Some of the most fundamental characteristics of a tax system are:

- Economic effectiveness which means that the tax system should not be an obstacle for investments or the job labor market and not affect the price system or free competition,
- Administrative simplicity which means that the tax system should be understandable and clear to the tax payers to comply with their obligations, also for the tax authorities to manage tax control and collection.
- Flexibility which means that the system should be able to react on time and easily in order to reflect the economic condition changes.
- Justice which means that the tax system should be fair when treats citizens of different economic conditions.

In Albania tax administration is done by tax authorities which are the General Directory of Taxes (DPT) and the Ministry of finance together with institutions under

their management. One of the most important problems that every tax administration needs to face is tax evasion, intentional or not. Making false declarations on business transactions data in order to escape from the payment of the tax obligation is punishable by law and penalties or enforcement measures will be taken in any case. Such phenomenon can be summarized under the term informal economy which has severe consequences because it freezes or slows down the investment rate and destroys the fair competition in the market.

Collecting information in tax evasion or informal job market is very difficult, but its existence is a fact and therefore it is a duty of tax control authorities to minimize tax evasion.

Their main objective is to minimize the difference in value of the declared taxable level from the tax payer and the real tax level that they need to pay according to the law. The best solutions to informality of the economy are raising awareness on the firms on the negative effects that tax evasion brings to the tax payer business and the economy in general. Continuous controls by the authorities can not include all of the businesses because of the limited human resources of the authorities compared to the high number of businesses.

However they are a good method to test the trustworthiness of the financial statements of economic entities and to support the in calculating and obeying the correct level of tax.

## CHAPTER 6

### CONCLUSIONS AND FUTURE WORK

Agent-based tax evasion models have gained much popularity over recent years because they allow for analyzing tax compliance behavior in large populations of heterogeneous agents that interact with each other in a direct manner. Moreover, these models can take a high degree of complexity into account; for example, by simultaneously incorporating various policy parameters of the government, by endowing each individual agent with a different set of attributes regarding income, risk aversion, etc. or by calibrating individual agent behavior with a diversity of different individual human behavior patterns, which may have been discovered in tax evasion experiments with human subjects, in fields such as economic psychology or by empirical analysis. To this extent, and in contrast to traditional models, agent-based tax evasion models enable the analysis of tax evasion dynamics in a fairly realistic way, which in turn may lead to new insights and policy options for combating tax evasion.

Related to the case of the Albanian economy, the best solutions to informality of the economy are raising awareness on the firms on the negative effects that tax evasion brings to the tax payer business and the economy in general. Continuous controls by the authorities can not include all of the businesses because of the limited human resources of the authorities compared to the high number of businesses. However they are a good method to test the trustworthiness of the financial statements of economic entities and to support the in calculating and obeying the correct level of tax.

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