THE FIRM, PART OF THE ECONOMIC SYSTEM: REASONS FOR EXITING A MARKET – AN AGENT-BASED MODELING APPROACH

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Abstract
What are the reasons for which firms exit markets? In today's world the processes by which firms enter and exit markets are becoming more and more complex due to the fine networking system globalization and communication create at every level. To find and point out the reasons for which firms or their branches disappear off the market, we stylized and simplified market concepts and developed them in an agent-based model. Using NetLogo, we created an artificial market model where firms and their branches enter or exit the market, produce and sell goods and hire the people inhabiting this world.

Keywords: *firm, agent-based model, market, system, globalization*

JEL classification: *A10, C60, E20, G30, J00, P40.*

1. Introduction

What are the reasons for which firms exit a market?

In today's world everything has become even more complex and relative than it was before. This is mainly because of the expansion of the means of communication (internet, mass media, cloud computing etc.) that lead to the creation of an extremely fine, complex and interdependent network. This network includes everything from the environment, people, all kinds of firms and organizations, economies, countries et cetera. Even if this network might not be so new, at least the human race has never been so conscious of it.

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We often call this giant network "globalization", praise its advantages and impeach its disadvantages.

Due to the complexity and interdependence of this network, we can no longer characterize and study (the global economy) it with the classic and Euclidian/Darwinian methodology, but need a new one that can picture it better. We can consider such a methodology the one offered by complex and adaptive systems theory. Allen, Strathern and Baldwin (2005) say that in order to improve the world we live in, we need to be able to explore the consequences of policies and interventions. Thus, understand the effects that a certain social situation might cause and how we could change these policies in order to modify the social situation in a favorable way. The traditional way, in which the situation is seen as a mechanical system with fixed actors that interact in a predictable way, doesn't succeed to surprise the fluid nature of human behavior and the actors' ability to modify their previous habits as an answer to the situation's new opportunities or constraints. In order to have successful policies and interventions, we need to change the policy-makers' representation and/or perspective from mechanical to an evolutionist one, in which structural changes can take place. The perspective offered by the approach of complex systems offers a new paradigm. This is one that is integrative, in which we have more agents, each one with their own subjectivities, perspectives and perceptions, that interact and evolve qualitatively and simultaneously with the structure of the interactions and with what the agents change one with the other. An important point in generally understanding social systems is the fact that the systems that self-organize are able to break up the symmetry and create important behavior differences between populations that were identical before the rupture. Thus, a system with internal diversity can evolve qualitatively in time and this diversity doesn't have to be real, because it is sufficient for it to exist as a "speculation" in the mind of one of the system's actors so that the non-linear interactions transform it in reality.

Unfortunately, even this methodology of study can't illustrate the infinite complexity of the world, but it gives a finer and more profound understanding of it.

In this paper we make use of general concepts of the complex and adaptive systems theory, and to be more exact of agent-based modes, because they can offer a different and much more complex perspective of the economic system. Epidemiology, traffic control, demographics, physics are just a few of the domains in which agent-based models are already used with success by policy-makers. There are also models that simulate with success small parts of the economy, like the EURACE project that models the European economy or Lengnick's 2011 baseline macroeconomic model [1].

1.1. Agent-based modeling, economics and firms

One of the basic entities that form the economy, be it local, regional, national or global, are the firms. Their birth, activity and death has influence on the way the economy flows and thus the evolution of the society, politics, environment etc. The main objective of a firm is to make profit, so in order to regulate the firms and their activity, humankind developed several methodologies for finding out a firm's “health” level. Some of these methodologies are accounting and audit that regulate the flows of money that enter and exit a firm, and corporate governance, that regulates the rules by which the firm is directed and controlled. Until now, firms were verified by using all kinds of equations, but because this is a reductionist methodology, we will use agent-based modeling for doing this, because, as we said before, this methodology gives a much more complex view upon the firm than the previous one. A good agent-based model that simulates very well the economy and studies the evolution of firms is the one built by Legninck in one of his 2011 papers. In this particular research, Lengnick presents a baseline macroeconomic model that is built upon a model developed by Gaffeo at all in 2008 and reproduces a lot of the stylized facts of business cycles. Lengnick's model has only two types of agents: households and firms, the model's economy is allowed to self-organize toward a spontaneous order. These two kinds of agents use simple behavioral rules for choosing prices and wages and a part of them are allowed to buy only from a subset of agents. If Gaffeo et all's 2008 model analyzes growth as a result of investment in Research and Development, uses a third type of agents (banks) and indexes time by quarters, Lengnick measures time in his model in days and months and aims to create a model related to basic macroeconomic relations in a non-growth environment.

Another research that uses agent-based modeling for measuring the effects of firms on a market is presented by Ciutacu, Vîntu and Săvulescu in one of their 2012 papers. In this paper, firms are seen as a part of a simple economic model that uses only three types of agents: firms, products and men, in order to find out what are the possible reasons for which this simple economy model might enter a crisis. This research was built using as inspiration Wilensky's 1999 WolfSheepPredation Model, thus, the three types of agents develop between themselves relationships similar to a prey-predator one because this also happens in a real economy: the firms “feed” on the labor offered by the men who “feed” on products offered by firms et cetera. This model is special because in the moment the men or the firms cease to exist, the artificial “world” created through the agent-based model enters a crisis and ends, just like an era, allowing the user to see what caused the crisis. The model presented by Ciutacu, Vîntu and Săvulescu 2012 and the one developed in this paper use the same computer program for agent-based modeling: NetLogo.

1.2. About NetLogo

NetLogo is one of the many programs used for creating agent-based models. It was created by Ury Wilensky in 1999 as the next generation of the series of multi-agent modeling languages that include StarLogo and StarLogoT. Ever since its creation, NetLogo has been in continuous development at the Center for Connected Learning and Computer-Based Modeling within Northwestern University. Because this program can model very well complex systems which develop over time and the modeler can give instructions for hundreds or even thousands of agents to operate independently and simultaneously, NetLogo gives its users the possibility to study deeply the connection between the behavior of individuals at micro-level and the patterns that emerge from their interaction at macro-level.

NetLogo runs on the Jawa virtual machine, thus it can be used on all major personal computer platforms: Machintosh, Windows, Linux etc. It has three tabs: one with an interface where the modeler or user can set the variables for a new simulation of the model and see the agent interaction, another one where the creator of the model can write information about the model and the way it functions and a last tab with the programming code for the model.

This program has four types of agents that can be used for creating the desired model: patches, turtles, links and the observer. The main characteristic of the patches is that they can't ever change their position, opposite to the turtles, that are the only NetLogo agents that can move. The links connect two turtles and can be directed or undirected, with directed links for parent-child relationships between the turtles, and undirected for equality relationships between turtles. And last, but not the least, the observer is the agent through who's eyes and virtual body, the designer sees, designs and modifies his model.

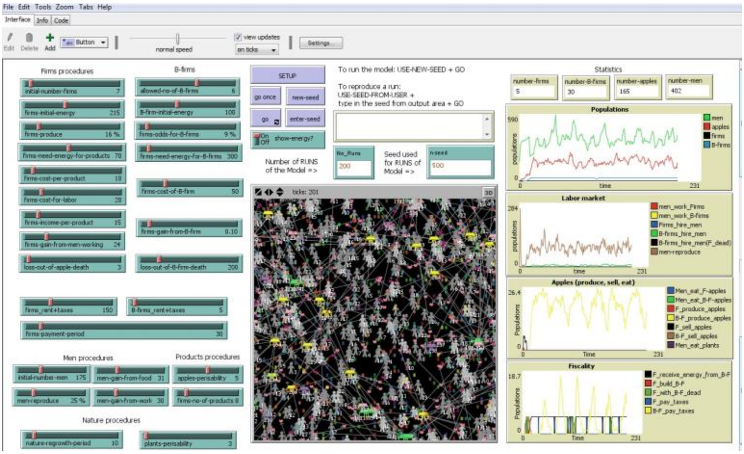
2. The Model

This paper's model uses five breeds of turtles: men, firms, their branches (B-firms) and their products (apples) and products that are grown by nature (plants). The world is a 61 * 61 patches torus, each patch having 7 pixels. The time in our NetLogo model is measured in ticks, one tick lasting as long as it takes a man to move from a patch to the one near to it. The firms, their branches and products are connected by two breeds of directed links. This kind of link shows us which turtle is the "parent" of the new one, so the firms will connect to their branches by a certain type of link, and the same happens for the firms and branches with the apples they produce. The currency of this world is energy, but not only that because we can think at this also like being the sum of the resources a man, a firm or a product has when it is created in our artificial world, but also because energy isn't wasted on Earth, it only changes it's' shape and state and we can easily consider money the energy of an economy. The NetLogo interface tab of our model looks just like Figure 1, while our artificial economy, and especially the turtles, were created using the following rules:

– The men:
- appear on the surface of the world in the number indicated by the slider *initial-number-men* and the initial energy of 50 units,

```
to setup-world
 set-default-shape men "person"
 create-men initial-number-men
 [
  set size 3
  setxy random-xcor random-ycor
  set color gray
  set energy 50   ]
...
end
```

Figure 1: The tab interface of our NetLogo model and the results of the first scenario



(Source: Author processing)

- can reproduce themselves when the probability for this is favorable and their level of energy is higher than *40 units*. The newly created man is like a clone of the agent that created it.

```
to reproduce
  ask men [
    ifelse random-float 100 > men-reproduce and energy > 25 [
      set energy (energy / 2)
      set color gray + 2
      hatch 1 [
        rt random-float 360
        fd 1   ]  ]
    [set color gray]   ]
end
```

- are the only NetLogo agents of this model that can move themselves and every time they take a step, they lose *1 unit of energy*. Every step of a man is one patch big and lasts *1 tick*.

- eat an apple produced by a firm or a B-firm in the moment they encounter one in their way, thus they gain the energy indicated by the slider *men-gain-from-food* and they pay to the firm that produced the apple a price, the energy indicated by the slider *firms-income-per-product.*

```
to eat-and-sell-products
  ask men [
    let food one-of apples-here
    if food != nobody [
    ask food [die]
    set energy (energy + men-gain-from-food - firms-income-per-product)
    ask firms [set energy (energy + firms-income-per-product)     ]    ]   ]
end
```

- get a job when they encounter a firm or a firm's branch, a B-firm. The job lasts 1 tick and it pays the man the wage indicated by the slider *men-gain-from-work.*
- die when they are left out of energy.

```
to men-death
  ask men [
    if energy < 0
    [die]  ]
end
```

- The firms:
  – are created in our NetLogo world in the number indicated by the slider *initial-number-firms*, have the initial energy equal to the value indicated by the slider *firms-initial-energy* and a random position that is set by the computer that runs the model.

```
to setup-world
  ...
  set-default-shape firms "building store"
  create-firms initial-number-firms
```

```
 [
   set size 4
   setxy random-xcor random-ycor
   set color blue
   set energy firms-initial-energy
   set debt firms-payment-period   ]
 ...
end
```

- maintain their position during the entire run of the model, but can create their own branches, named *B-firms*, and can produce goods, named *apples*.
- can produce apples if its energy is bigger than the value indicated by the slider *firms-need-energy-for-products*, if the probability is favorable for this and if the number of apples on the market is lower than twice the number of men that live in the NetLogo model in that moment. The probability is favorable for producing apples if the random number chosen by the computer between 1 and 100 is bigger than the value indicated by the slider *firms-produce.*
- use the amount of energy indicated by the slider *firms-cost-per-product* for generating each product that the firm is allowed to produce. The number of apples the firm can produce during a run of the model is indicated by the slider *firms-no-of-products.*
- when producing apples, the remaining energy respects the following formula: $Energy_{T-1} = Energiy_{T} – (firms\text{-}cost\text{-}per\text{-}product * firms\text{-}no\text{-}of\text{-}products)$

- receive from the man that consumed one of their apples, the value of energy or price indicated by the slider *firms-income-per-product.* This mechanism is possible thanks to the directed links that connect the firms to their products.
- loose the energy indicated by the slider *loss-out-of-apple-death* if the apple disappears from our NetLogo world for not being consumed. An apple disappears from our NetLogo world or dies if it isn't consumed in the period of time (number of ticks) indicated by the slider *apples-perisability*.

```
to perisability
 ask apples [
  ifelse countdown = 0 [
     ask firms [
      set energy (energy - loss-out-of-apple-death)        ]
     ask B-firms [
       set energy (energy - loss-out-of-apple-death)       ]
     if countdown = 0
      [die]
  ][
    if countdown > 0
      [set countdown (countdown – 1)       ]  ]  ]
...
end
```

- The B-firms:
  - when the computer chooses randomly a number from 1 to 100 that is bigger than the value of the slider *firms-odds-for-B-firms,* the energy had at that point is bigger than the value of the slider *firms-need-energy-for-B-firms* and the number of branches that particular firm already has is smaller than the value of the slider *allowed-no-of-firms,* the firm can create a new branch, *B-firm,* that is connected to it by a *directed link.*
  - When a branch is born, the firm looses the value indicated by the slider *firms-cost-of-B-firm* following this formula: $Energy_{T-1} = Energy_{T} – (firms\text{-}cost\text{-}of\text{-}B\text{-}firm + B\text{-}firm\text{-}initial\text{-}energy)$
  - the newly created branch has the same features as its "mother" firm, but an initial energy equal to the value indicated by the slider *B-firm-initial-energy*. Thus, the B-firm acts just like a normal firm when it hires men and produces apples. The only difference being that, at every tick, it gives to its mother firm the percent of its earnings that it's indicated by the slider *firms-gain-from-B-firm,* following these formulas:

* for producing apples: *Energy received by firm from B-firm = (B-firm-energy + firms-income-per-product) * firms-gain-from-B-firm)*
* for hiring men: *Energy received by firm from B-firm = (B-firm-energy + firms-gain-from-men-working - firms-cost-for-labor) * firms-gain-from-B-firm)*

- a B-firm goes bankrupt and exits the market the moment it's left out of energy (*energy = 0).* In this moment, the mother firm of that branch looses the energy indicated by the slider *loss-out-of-B-firm-death.*
- The user of the model can choose if the firm can produce or not B-firms by switching on or off the switch *show-B-firms.*

- *Hiring men:*
- The firm or B-firm receives energy when they hire a man. The value of the entry of energy is equal to the one set by the user with the slider *firms-gain-from-men-working.* The firm or B-firm hires a man when this agent encounters them while moving in the NetLogo world.
- When hiring a man, the firm or B-firm looses the energy indicated by the slider *firms-cost-for-labor* and this slider always respects the following rule: *firms-cost-for-labor* < *firms-income-per-product*

- Exiting a market (firm or B-firm procedure):
- When the mother firm has less than *110* units of energy, it "dies" and gets off the market, but if its branches still have energy, they remain on the market as firms of their own. The B-firms exit the market when they have an energy level that is smaller than 30 energy units.
- The firms and B-firms have to pay at every tick interval set by the user through the slider *firms-payment-period* a rent plus taxes for producing and selling apples in this NetLogo world. The values of these rents and taxes are set by the sliders *firms_rent+taxes* and *B-firms_rent+taxes.*

```
to firms-pay-rent+taxes
 ask firms [
  ifelse debt = 0 [
   if debt = 0 [
      set energy (energy - firms_rent+taxes)
      set debt firms-payment-period    ]    ]
```

```
  [if debt > 0 [
     set debt (debt - 1)   ]   ]   ]
end
```

2.1. Preparing the model and setting the scenarios

Because we want our scenarios to be reproducible, we will add a piece of programming code that will allow us to set a seed number after which all the random numbers from the model will be set by the computer. This number must be an integer in the range -2147483648 to 2147483647. For our model we will chose the seed 500 and for reproducing the scenarios we will run for 200 ticks. Our dummy market will have the following characteristics:

- there will be 7 initial firms that will be allowed to have a maximum of 6 B-firms each,
- the firms will have an initial energy of 215 energy units, while the B-firms will have only 100 energy units.
- The firms have a probability of 9% to open B-firms and need an energy level bigger or equal to 300 energy units. A B-firm costs a firm 50 energy units when built, will pay a firm 10% of its earnings and will cost a firm 200 energy units when it will exit the market.
- The probability for a firm to produce goods is of 17%. For producing a maximum of 8 goods per tick, a firm needs an energy level of at least 70 energy units. An apple costs a firm 10 energy units when it's produced and 3 energy units when it exits the NetLogo world, because the firm looses this "money" for every apple that is produced and isn't sold. With every apple it sales, the firm earns 15 energy units. The life period of the apples on the market after being produced is of 5 ticks.
- The initial number of men that inhabit our model is of 175 men which have a 5% probability to reproduce themselves. Each of them receives 31 energy units when eating an apple and 30 energy units when he gets a one tick job. The firm gains 24 energy units from the work of a man and pays him for his work with 20 energy units.
- Each 30^{th} tick every firm pays 150 energy units in rents and taxes, while a B-firm pays 5 energy units.

In order to test our model we will consider five scenarios:

1. Testing the model without any change.

2. The taxes the firms pay for being players on our dummy market model grow from 150 to 200
   energy units for the firms, and from 5 to 10 energy units for the B-firms.
3. The taxes are cut from 150 to 100 energy units for the firms, and from 5 to 3 energy units for the B-firms.
4. The cost for hiring a man and for opening a B-firm grow from 20 to 23 energy units for the price of labor, and from 50 to 60 energy units for building a B-firm, while the need of energy for doing this grows from 300 to 320 units.
5. The costs for hiring a man and for opening a B-firm are cut down from 20 to 17 energy units for the price of labor, and from 50 to 45 energy units for building a B-firm, while the need of energy for doing this decreases from 300 to 270 energy units.

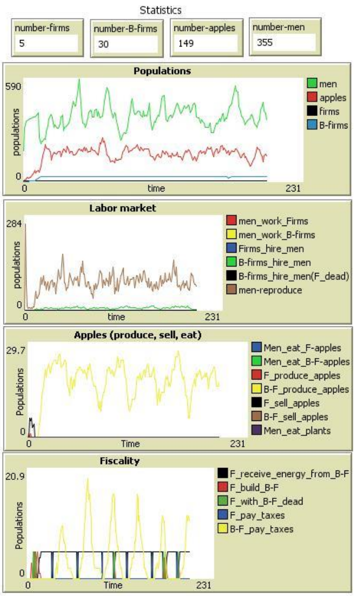
In figure 1 we can see how the NetLogo model looks like and the graphs with the results of first scenario's run.

- *First scenario's ("Testing the model without any change") results:* After this run, at the end of the 200th tick there were 5 firms, 30 B-firms, 165 apples and 402 men on the market. This means that two out of the seven firms got out of the market, but those remaining had a good "health" because all of them had each 6 B-firms. One of the firms got out of the market in the 1st tick, while the other one left the market in the 6th tick, but this didn't affect the number of B-firms on the market, because the firms were still young on the market and hadn't reached equilibrium yet. The production of apples grew from 60 to 200 in the 14th tick, boom that coincided with that of B-firms on the market, because their number grew from 6 to 30. There were 3 times when the number of B-firms on the market decreased, but only one of them had a major impact on the market, because it lead to the decrease of the average apple production from 165-170 apples/tick to 140-145 apples/tick. Like we can see in figure 1 in the graph named Populations, this "crisis" lasted for about 20 ticks and it started in the 97th tick. During this run we had an average population of about 350-375 men/tick, while the number of births had a mean of about 85/tick. The men were hired mainly by the B-firms, with an average of 5-10 men hired/tick, like we can see in the graph named Labor market. The firms sold apples only in the first 10 ticks, after which the firms lived mostly from what the B-firms gave them from hiring men and selling apples, just like the graph Apples (produce, sell, eat) indicates. This can be seen as well in the graph Fiscality because the firms built B-firms only after the 3 moments in which the number of B-firms on the market decreased, in order to keep their incomes.

- *Second scenario's ("Taxes grow") results:* Like is shown in figure 2, after this run, at the end of the 200th tick there were 5 firms, 30 B-firms, 149 apples and 355 men on the market. Just like in the first scenario, this means that two out of the seven firms got out of the market, but those remaining had a good "health" because all of them had each 6 B-firms. One of the firms again got out of the market in the 1st tick, while the other one left the market also in the 6th tick, but this didn't affect the number of B-firms on the market, because the firms were still young on the market and hadn't reached equilibrium yet. The production of apples grew from 70 to 340 in the 6th tick and then to 395 in the 14th tick, boom that coincided with that of B-firms on the market, because their number grew from 0 to 30 in the first 14 ticks. There were again 3 times when the number of B-firms on the market decreased, but only the one in the 168th tick had a major impact on the market, because it lead to the decrease of the average apple production from 160 apples/tick to about 120 apples/tick. Like we can see in figure 2's graph Populations, this "crisis" lasted for about 30 ticks and it started in the 167th tick. During this run we had an average of about 370-380 men/tick, while the number of births had a mean of about 85-90/tick. The men were hired mainly by the B-firms, with an average of 7-10 men hired/tick, like we can see in the graph named Labor market. The firms produced apples only in the first 4 ticks and sold them only in the first 7 ticks, after which the firms lived mostly from what the B-firms gave them from hiring men and selling apples, just like the graph Apples (produce, sell, eat) indicates. This can be seen as well in the graph Fiscality because the firms built B-firms only after the 3 moments in which the number of B-firms on the market decreased, in order to keep their incomes. All the firms were correct and paid their taxes on time.
- *Third scenario's ("Taxes are cut down") results:* Like is shown in figure 3, after this run, at the end of the 200th tick there were 5 firms, 30 B-firms, 165 apples and 402 men on the market. Just like in the

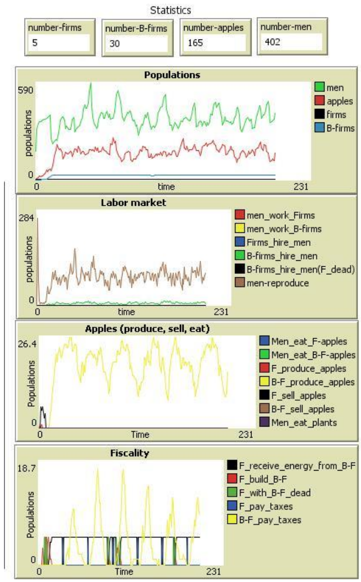
first and second scenario, this means that two out of the seven firms got out of the market, but those remaining had a good "health" because all of them had each 6 B-firms. Both firms that got out of the market did it in the 6^{th} tick, but this didn't affect the number of B-firms on the market, because the firms were still young on the market and hadn't reach equilibrium yet. The production of apples grew from 52 to 214 between the 13^{th} and the 19^{th} ticks, boom that coincided with that of B-firms on the market, because their number grew from 0 to 30 in the first 19 ticks. There were again 3 times when the number of B-firms on the market decreased, but only the one in the 95^{h} tick had a major impact on the market, because it lead to the decrease of the average apple production from 185 apples/tick to about 160 apples/tick. Like we can see in figure 3's graph Populations, this "crisis" lasted for about 30 ticks and it started in the 98^{th} tick.

Figure 2: The second scenario's results



(Source: Author processing)

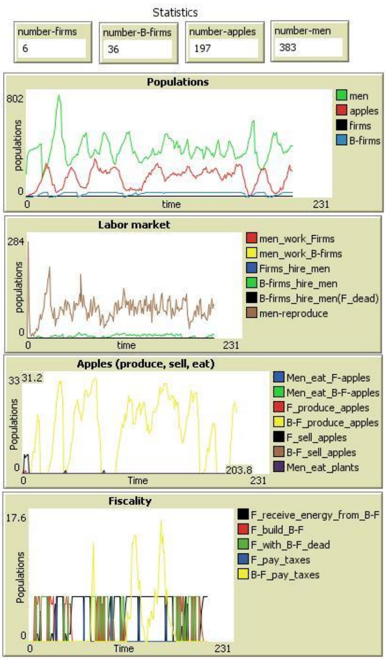
Figure 3: The third scenario's results



(Source: Author processing)

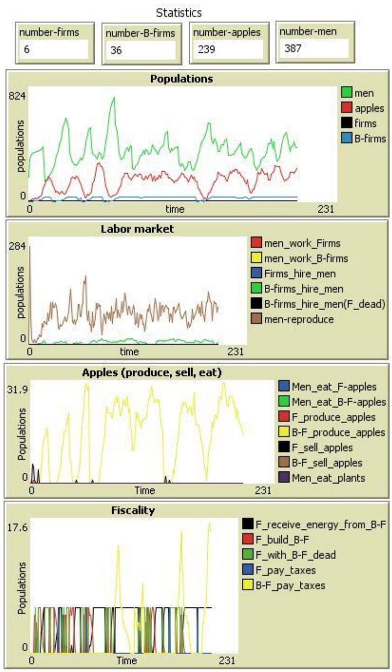
During this run we had an average of about 400 men/tick, while the number of births had a mean of about 95-100/tick. The men were hired mainly by the B-firms, with an average of 8 men hired/tick, like we can see in the graph named Labor market. The firms produced apples only in the first 3 ticks and sold them only in the first 8 ticks, after which the firms lived mostly from what the B-firms gave them from hiring men and selling apples, just like the graph Apples (produce, sell, eat) indicates. This can be seen as well in the graph Fiscality because the firms built B-firms only after the 3 moments in which the number of B-firms on the market decreased, in order to keep their incomes. Just like in the previous scenarios, all the firms were correct and paid their taxes on time.

Figure 4: The fourth scenario's results



(Source: Author processing)

Figure 5: The fifth scenario's results



(Source: Author processing)

- *Fourth scenario's ("Costs grow") results:* Like is shown in figure 4, after this run, at the end of the 200th tick there were 6 firms, 36 B-firms, 197 apples and 383 men on the market. Just like in the previous scenarios, this means that one out of the seven firms got out of the market, but those remaining had a good "health" because all of them had each 6 B-firms.
  The firm that got out did it in the 2nd tick, but this didn't affect the number of B-firms on the market, because just like in the previous scenarios, the firms were still young on the market and hadn't reach equilibrium yet. The production of apples grew from 47 to 247 between the 8th and the 15th ticks, boom that coincided with the first boom of B-firms on the market, because their number fist grew from 6 to 34 in these ticks. This time there were 5 times when the number of B-firms on the market decreased, but the most severe lasted from the 164th tick to the 174th tick and its impact on the market was a major one, because it lead to a production of only 16 apples and to a decrease of about 400 men to only 202 men in the 175th tick. Like we can see in figure 4's graph Populations, all five "crises" lasted for about 10 to 25 ticks each. The longest of this "crises" lasted from the 68th tick to the 93rd one. During this run we had an average of about 380 men/tick, while the number of births had a mean of about 90-93/tick. The men were hired mainly by the B-firms, with an average of 5-8 men hired/tick, like we can see in the graph named Labor market. During the first 3 "crises" the firms sold apples, this was exactly the time when the number of B-firms decreased on the market. After the "crises" were overcome the B-firms were the ones selling apples and hiring men, just like the graph Apples (produce, sell, eat) indicates. This can be seen as well in the graph Fiscality because the firms built B-firms only after the moments in which the number of B-firms on the market decreased, in order to keep their incomes. Just like in the previous scenarios, all the firms were correct and paid their taxes on time.
- *Fifth scenario's ("Costs are cut down") results:* Like is shown in figure 5, after this run, at the end of the 200th tick there were 6 firms, 36 B-firms, 239 apples and 387 men on the market. Just like in the previous scenarios, one out of the seven firms got out of the market, but those remaining had a good "health" because all of them had each

6 B-firms. The firm that got out did it in the 1st tick, but this didn't affect the number of B-firms on the market, because just like in the previous scenarios, the firms were still young on the market and didn't reach equilibrium. The production of apples grew from 23 to 177 between the 6th and the 15th ticks, boom that coincided with the first boom of B-firms on the market, because their number fist grew from 6 to 36 in these ticks. This time there were 5 times when the number of B-firms on the market decreased, but now all the depressions had severe effects because in the fourth "crisis" in the 144th tick the production of apples almost reached 0, while the number of men decreased to a minimum of 212 men. Like we can see in figure 5's graph Populations, all five "crises" lasted for about 10 to 25 ticks each. During this run we had an average of 320 men/tick, while the number of births had a mean of about 75-80/tick. The men were hired mainly by the B-firms, with an average of 4-7 men hired/tick, like we can see in the graph named Labor market. During every major "crisis" that lead to a major decrease of the apple production, the firms sold apples exactly in the same time the number of B-firms decreased on the market. After the "crises" were overcome the B-firms were the ones selling apples and hiring men, just like the graph Apples (produce, sell, eat) indicates. This can be seen as well in the graph Fiscality because the firms built B-firms only after the moments in which the number of B-firms on the market decreased, in order to keep their incomes. Just like in the previous scenarios, all the firms were correct and paid their taxes on time, only that the graph Fiscality had more movement during this scenario, indicating that the market was very turbulent.

3. Conclusions

The above model can be improved by introducing a rule by which in the moment that a B-firm exits the market its products do the same. Otherwise, the situation that appears is similar with what happens when a firm goes bankrupt, but nobody takes care of capitalizing the goods the firm already produced but did not sell yet. These goods are taken and consumed by people without paying their price, and this has negative effects upon the firm on one side, because the firm might have survived if these goods would have been harnessed. On the other side, this situation is usually found in the countries or regions in which the juridical and legal systems are reordering themselves after a social, economic, politic disequilibrium or a natural catastrophe, and this thing can help the population to survive until the social, economic, politic and/or environment will reach again an equilibrium like in the case of the supermarkets robbed by the survivors of the 2010 Haiti earthquake a few days after the natural catastrophe, or it might disadvantage it even more on long term, because these goods might be harnessed only by a few persons and this in their own personal interest, like in Romania, after the 1989 Revolution, when many of the state owned firms were sold piece by piece at prices that didn't reflect their true value.

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