Participatory Economics Classroom Simulation

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In this paper, I describe how to conduct a classroom simulation based upon a Participatory Economy. A Participatory Economy is a potential third option for organizing economic activity, one that is neither market based nor centrally planned. Students will take part in an iterative planning procedure as they make production and consumption decisions collectively, inside a one-person-one-vote paradigm. The process is time consuming, but with the direction of this article can be completed in a 50-minute class period. I include student handouts and discussion questions in the appendices. This exercise is valuable not only because it helps students imagine other alternatives to economic organization, but also because it makes explicit the great deal of coordination achieved automatically in a market that is fully cleared. Students usually come away with a deeper understanding of both a participatory economy and a market economy.

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INTRODUCTION

Often in our classrooms the decision about how to best organize economic activity comes down to only two options: free markets and central planning.[1] The central tenets of the free market tend to be (at least moderately) well understood by our students, and central planning (and the failures this can lead to) is often covered in principles of economics courses as a juxtaposition to the efficiency of free markets. Alternatives to this dichotomous presentation are available, at least theoretically, but they can be difficult to convey to students in a brief period of time. Furthermore, it is even more difficult to allow students to gain enough of an understanding of the machinations of these alternatives to be able to critically analyze the benefits and costs of the associated systems. This paper presents a classroom simulation which seeks to expose students to an economy that is planned in a decentralized, participatory manner à la Albert and Hahnel (1991). Students will thus develop an intuitive "feel" for the benefits and costs of the system. This additional understanding will give them an option against which to compare the free market's rationing mechanism.

The process of using simulations of mini-economies to teach economics is not new. Chamberlin (1948) had students negotiate in small groups inside the classroom. Wells (1991) reviews a number of ways to introduce experimental markets to the classroom. Holt (1996) outlines a simulation of a pit market. Carleton University (website) offers a list of online resources which enable students to engage in market trade in real-time with their classmates. The simulation described in this paper follows from the above literature, but teaches students the iterative processes of a participatory economy. This simulation simplifies the planning process somewhat by fixing input prices and the number of consumption goods in order to fit into a standard 50-minute class period.

BACKGROUND

Participatory economics, or Parecon[2], as a market ideology started with the writings of Michael Albert and Robin Hahnel in the 1990's. It presents a fairly detailed overview of a potential alternative economic system. Their idea is sufficiently detailed as to allow construction of a classroom simulation of an economy governed by participatory economics. Parecon "proposes to achieve economic democracy, economic justice, and human solidarity while protecting the environment and ensuring efficiency" (Hahnel and Wright, 2014) by the creation of the following institutions:

1. self-governing, democratic councils of workers and consumers where each member has one vote;
2. jobs balanced for empowerment and desirability by the members of worker councils themselves[3];
3. compensation according to effort as judged by one's workmates;
4. a participatory planning procedure in which councils and federations of workers and consumers propose and revise their own interrelated activities without central planners or markets, under rules designed to generate outcomes that are efficient, equitable, and environmentally sustainable; and
5. common ownership of the means of production.

Every citizen is simultaneously a member of a consumer's council and a worker's council. The consumer's council is approximately the size of a neighborhood and the worker's council is approximately the size of a firm. Each of these councils is nested inside even larger councils and federations that scale up to the size of the economy as a whole. The individuals submit detailed consumption and production plans to their local councils which, when approved, are sent to the next-higher council. This larger council adds to the plans requests for public goods at their geographic level and sends all of the plans to the next-higher council. Eventually, all plans end up with an Iteration Facilitation Board (IFB), which sums up the total planned supply and demand of products.

In the case of a quantity mismatch, the IFB has two options to equate planned supply with planned demand. Suppose the case of excess planned demand. The IFB can either:

- raise the "indicative price" of the good - which should decrease demand, or
- raise the "indicative wage" for laborers who produce this good - which should increase supply by inducing more laborers to devote their labor to this task.

The IFB then announces the new indicative prices/wages and then allows the individual councils to resubmit plans based upon the new prices. This iterative process continues until planned demand is equal to planned supply. At this point, production and consumption for the upcoming year begins.

What follows is an outline of the functioning of a Parecon planning process, which heavily draws from Erik Olin Wright's summary (Hahnel and Wright, 2014):

1. At the beginning of the process, the IFB announces current estimates of indicative prices for everything (consumption items, inputs to production, labor, etc.) based on estimates of opportunity costs and positive and negative externalities in the production of all goods and services.[4]
2. Each household begins the process with a budget constraint determined by: a) an effort rating based on the contributions of labor effort by all household members during the previous year, and b) a consumption allowance for people who simply don't want to work (this is, in effect, an unconditional basic income, presumably set at a level to fully meet basic needs).
3. Every year, individual households submit to their neighborhood consumer councils their requests for all the things they anticipate consuming in the following year given the household budget constraints and the indicative prices. In effect, they pre-order their annual household consumption.
4. The household proposals are reviewed by neighborhood consumption councils. If they fall within the budget constraint of the household, then they would normally be approved automatically. If there is a request for consumption above this level—in effect a request for a

loan—this would be reviewed more closely. If the proposals are rejected, households revise them.

5. Neighborhood consumption councils aggregate the approved individual consumption requests of all households in the neighborhood, append requests for whatever neighborhood public goods they want, and submit the total list as the neighborhood consumption council's request in the planning process.[5]
6. Higher level federations of consumption councils make requests for whatever public goods are consumed by their membership, and pass those on to the IFB.
7. On the production side, each worker's council produces one good (either final or intermediate). Workers are free to join the council they desire and are free to work as many hours as they desire.
8. Workers, who each have one vote, collectively decide how much production they will undertake in the upcoming year using the IFB's indicative prices to guide them. They also rate the effort level of all the other workers in their council, which determines individual budget constraints for the following year.
9. On the basis of all of the consumption proposals along with the production proposals from workers councils, the IFB recalculates the indicative prices as mentioned earlier and, where necessary, sends proposals back to the relevant councils for revision.
10. This iterative process continues until no revisions are needed.

SIMULATION SET UP

Before coming to the classroom, the instructor must print out one copy each of appendices A-C. One copy of appendix D *for each student* to use as an instruction sheet is also required. The instructor should also prepare a deck of ordinary playing cards by removing all the face cards, the 2's, and the 3's, and shuffling the deck.[6]

Upon arrival to the classroom where the simulation will occur, three volunteers must be sourced from the students for three main jobs: the IFB, the top-level worker federation and the top-level consumer federation. In an actual implementation of this model, these individuals would also be part of the economy (and the IFB, in theory, could just be a computer), but for simplicity we utilize three volunteers who will be placed "external" to the economy. Instruction sheets for these three jobs, as well as for the other students (the worker/consumers), are provided in the appendix. These three volunteers will spread out in the room. I like to have the "worker federation" be located in the front of the room, the "consumer federation" be located in the back, and the IFB be located at a desk in the middle/along the side (but often in front of a whiteboard so the current "indicative price" can be written for all to see).

While the instructor gives instruction sheets to the three volunteers and makes sure they understand them, the rest of the students are instructed to move their desks into groups of five with their proximate neighbors in order to form consumption councils. These consumption councils are permanent for the remainder of the simulation.

While the rest of the student worker/consumers are still seated, the next step is to distribute an "endowment" of leisure time to each student. This is accomplished by dealing from the previously prepared deck of cards. Using this endowment, each worker decides how many (if any) of their leisure hours they wish to work, with the only requirement being that it is less than or equal to the leisure endowment specified on their playing card. The students write the number of labor hours they wish to provide on a post-it note, provided by the instructor, that they affix to the face of the card.

In this simulation, there are only two worker councils who each produce one final consumption good. These two final consumption goods are pizza and beer, and they only require labor as inputs.[7]

SIMULATING THE ITERATIONS

The IFB volunteer announces the starting indicative prices of (10,10) for the two goods.

Production Planning

Students approach the front of the room where the "worker federation" volunteer motions to two locations that the students will congregate into two worker councils, one for each good. The students then choose which worker council they would like to join, and with their fellow workers, sum together the number of hours they provide to the production of the product. This determines production, at a rate of two beers per hour, and four pizzas per hour.[8] The worker federation volunteer helps both groups, reminding them of the task to be done and also recording the quantities of planned production. There is a time limit of 8 (5) minutes for this step.[9] The volunteer takes the planned production numbers and gives them to the IFB volunteer.

The workers then collectively decide which hour contribution is worth a "low" effort rating versus a "high" effort rating. They might, for instance, decide that 0-4 hours is low, and 5-10 hours is high effort. The students then add to their post-it note the words "low" or "high" to indicate which effort rating was given to them by their peers. There is a time limit of 5 (3) minutes for this step.

This concludes the production planning portion.

Consumption Planning

At this point, the students go back to their desks and converse with their consumption councils. They each have a budget constraint of 50 for "low effort" and 100 for "high effort".[10,11] The consumption councils sum together the demand for pizza and beer from their constituent members. The councils should check that all members are not exceeding their budget constraints. Underconsumption is possible (in theory, this is savings) but in this simulation will not be carried over. A delegate from each council takes the request to the "consumption federation" volunteer who then sums up all the planned consumption demand for this period. There is a time limit of 8 (5) minutes for this step.

The consumption federation and worker federation volunteers meet with the IFB to see if demand equals supply. If they are within 10%, production begins.[12] If not, then the IFB adjusts the prices, and the iteration begins again from the beginning of the consumption planning section.[13]

VARIATIONS

Only one good: This reduces the complexity of the simulation. Now, there is only one good, pizza, and the indicative price starts out at $10. Workers produce four pizzas per hour, and the rest of the simulation proceeds in the usual manner. The instructor can choose to have the students form only one worker council "firm", or as usual they can form two workers councils who both produce pizzas. Having two worker councils reduces the time needed to vote on production and effort determination, because the voting constituencies are smaller.[14]

Iterate production planning as well: This increases the complexity of the simulation. In this variation, in the case of a supply/demand mismatch, after the IFB announces the updated indicative prices, the students first proceed to the worker councils and determine a new quantity for supply, and then move into consumption councils to determine a quantity demanded. The simulation continues as usual.

CONCLUSION

This simulation allows students to innately understand how a Parecon society would function. They (and the instructor) will see that there are many steps—steps that are not overly complex, but ones that do require careful planning and explanation. This simulation, and Parecon in general, attempts (in an admittedly imperfect way) to prompt students into thinking about organizing economic activity with no markets and no central planning.

Another key feature of this simulation is that it helps the students realize explicitly the coordination that a market economy does all on its own. Economics teachers frequently mentioned that using the market to allocate goods organizes economic activity in the most efficient way. But students, living in an economy where outcomes controlled by the market are so ubiquitous, they may be unnoticed, learn this idea by having to "clear" the economy manually, in a democratic fashion.

ENDNOTES

1. This is the academic equivalent to Margaret Thatcher's famous TINA argument.
2. Robin Hahnel dislikes the usage of this term as it "conveys an otherworldly impression and fosters a cultish mentality I find detrimental to advancing discussions like this one among people thinking seriously about economic system change." (Hahnel and Wright, 2014, chapter 1, footnote 1).
3. This simulation does not allow for analysis of this point, as "jobs" here are homogenous in terms of desirability.
4. In this simulation, I only allow the price of output to be announced/changed. If both input and output prices are allowed to vary, the solution becomes a range of (input, output) prices instead of a point and the imbalance requires too many iterations to correct.
5. I exclude the production of public goods in this simulation for simplicity.
6. The deck, as specified, contains 28 cards, which will work for up to 28 students. If your classes are much larger, teams of two students can become one "person". Alternatively, in a lecture hall only the students on the aisles could participate. In this scenario, the instructor should carefully work to maintain a rapid pace of iterations, or the other students will quickly lose interest.
7. Any two goods could be chosen. I choose these two goods to create a likely imbalance of supply and demand at the first iteration—and because students like these items!
8. This is just an arbitrary production function, chosen to keep things simple.
9. The first iteration of each step has a longer time limit while the students are learning what to do. Subsequent iterations have a shorter time limit for each step, denoted in parenthesis.
10. These, actually, are the "indicative prices" for labor which in reality would be announced by the IFB at the beginning of every iteration. However, I fix these in the simulation as I discussed in footnote 4.
11. Using the parameters specified in this simulation, there is often excess demand in the market for the first few iterations.
12. The 10% figure allows the simulation to end earlier than if exact equality was required.
13. In an actual implementation, the iteration would proceed again from the beginning of the production planning section as well. Iterating only over the consumption planning section helps shorten the simulation.
14. Experience has taught me that running the simulation using only one good reduces the complexity and allows students to understand it better. I use this variation most of the time myself.

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APPENDIX 1: INSTRUCTIONS FOR IFB VOLUNTEER

Today we will explore what a participatory economy (parecon) could look like. Your role is that of the Iteration Facilitation Board. This very important role is actually a simple one: you compare the total demand for pizza and beer (as reported to you by the consumption federation volunteer) to total production (as reported to you by the worker federation volunteer) and decide if the numbers are within 10% of each other. If not, then you will adjust the "indicative prices" and announce them to your classmates, who will then resubmit plans to you again for your comparison.

The basics of the parecon society we are examining today are the following ideals:

1. self-governing democratic councils of workers and consumers where each member has one vote,
2. compensation according to effort as judged by one's workmates, and
3. a participatory planning procedure in which councils and federations of workers and consumers propose and revise their own interrelated activities without central planners or markets.

An outline of the simulation will look like this:

1. You announce the "indicative prices" for pizza and beer, which are 10 each, and write these on the board at the front of the classroom.
2. The students will then move into worker groups to decide production, and then into consumer groups to decide consumption. The two volunteers for these roles will help the students coordinate.
3. Once coordination is completed, these two volunteers (one representing the workers and another representing the consumers) will bring you the values of consumption and production that they are proposing to create for the upcoming year.
4. You will then compare the value of consumption to the value for production, for each good. You should create an acceptable range by taking the larger of the two numbers and adding 10% in both directions. If X is the amount of demand for pizza and is larger than Y, the production of pizza, the acceptable range for Y is between .9*X and 1.1*X. If demand is greater than supply and the numbers are not within the acceptable range, increase the price by 5. If supply is greater than demand, then decrease the price by 5.
5. Do this comparison for each of the two goods. If both production and consumption demand are within the ranges, then you announce to the class that production will begin (and the simulation is over). If not, then announce the adjusted prices to the class and write them on the board.
6. The other students will then restart their coordination procedures from the beginning, and will shortly submit to you another consumption/production proposal from the economy. You will again compare the numbers and iterate this process until the numbers for both goods are within the specified range.

APPENDIX 2: INSTRUCTIONS FOR WORKER FEDERATION VOLUNTEER

Today we will explore what a participatory economy (parecon) could look like. Your role is that of the Worker Federation. This role requires helping the two workers councils (one each for pizza and beer) plan their production quantities, which you will submit to the IFB for comparison. *You will need a notebook and a pen/pencil to record values.*

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2. compensation according to effort as judged by one's workmates, and
3. a participatory planning procedure in which councils and federations of workers and consumers propose and revise their own interrelated activities without central planners or markets.

An outline of the simulation will look like this:

1. The IFB volunteer will announce the "indicative prices" for pizza and beer (the two goods that the workers' councils will produce).
2. The other students will then move into worker groups to decide production. Your role is to help students organize into two groups, one of which will produce beer and the other one which will produce pizza.
3. You can help each worker council sum together the total number of labor hours they will collectively provide to labor (the sum of the labor hours they chose earlier, written on their playing card).
4. You then determine the number of fictional items they would produce. The following two algorithms apply:
    a. Total beer production = (sum of labor hours from beer workers)*2
    b. Total pizza production = (sum of labor hours from pizza workers)*4
5. Next, report these production numbers to the IFB. While you are doing this, the workers will vote on the limits for "low" and "high" effort ratings.
6. Students will then continue into consumer councils, and then planning process will continue to iterate until the planned consumption equals the planned production.

APPENDIX 3: INSTRUCTION SHEET FOR CONSUMER COUNCIL VOLUNTEER

Today we will explore what a participatory economy (parecon) could look like. Your role is that of the Consumer Federation. This role requires you to sum together the total demand for goods (pizza and beer) that each of the neighborhood councils (each having about 5 students, and who were organized by the instructor in the beginning) demands. Once you sum together the total number of goods demanded, you submit these to the IFB for comparison. *You will need a notebook and a pen/pencil to record values.*

The basics of the parecon society we are examining today are the following ideals:

1. self-governing democratic councils of workers and consumers where each member has one vote,
2. compensation according to effort as judged by one's workmates, and
3. a participatory planning procedure in which councils and federations of workers and consumers propose and revise their own interrelated activities without central planners or markets.

An outline of the simulation will look like this:

1. The IFB announces the "indicative prices" for pizza and beer, and then the students move into two worker councils to decide production.
2. The students will then return to their seats which are arranged in their neighborhood consumption councils of five desks each. You task is to facilitate the planning of consumption of each council.
3. Each council reviews the consumption plans of each member to make sure that the members don't request something that exceeds their individual budget constraints. The individuals' budget constraints are 50 for those students voted to have "low" effort, and 100 for those students voted to have "high" effort. The consumers can spend these budget constraints however they desire for the two goods (according to the prices announced earlier by the IFB).
4. Once each council has reviewed the consumption plans of each member, they submit them to you, and you sum up total planned consumption for the whole economy.
5. You submit these numbers to the IFB for comparison.
6. The iterations will continue until planned consumption equals planned production.

APPENDIX 4: INSTRUCTION SHEET FOR ALL OTHER STUDENT WORKERS/CONSUMERS

Today we will explore what a participatory economy (parecon) could look like. Imagine that you live in a parecon society, and everyone is familiar with the parecon society's rules.

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2. compensation according to effort as judged by one's workmates, and
3. a participatory planning procedure in which councils and federations of workers and consumers propose and revise their own interrelated activities without central planners or markets.

An outline of the simulation will look like this:

1. At the start, the instructor will have you organize into groups of about 5 each, with your proximate neighbors, in order to form "consumer councils."
2. You will be handed a leisure "endowment" of time which you can dedicate to either leisure or production. You should decide your allocation based on what makes you the happiest. However, please understand that your worker council colleagues will determine your effort level based upon this decision, which will determine your budget constraint and your consumption level.
3. Write your chosen number of labor hours on to a post-it note which you can affix to your playing card.
4. The IFB then announces the "indicative prices" for pizza and beer.
5. You will then leave your desks and move into one of the two worker groups to engage in production for the society. You are free to choose between producing either pizza or beer. Once the sorting process has settled, you should each report out loud your chosen number of provided labor hours. The worker federation will sum the total number of hours.
6. Your next task is to collectively vote on the boundary between "high" and "low" effort individuals. For example, you might choose to vote by asking all of the members whether the boundary should be between 0 and 1 hours and record the number of "yes" votes. The repeat this process for each of 1 and 2, 2 and 3, etc., up until the highest number of labor hours provided by any worker. The boundary that gets the highest level of "yes" votes could be the agreed upon boundary. Or you may select any other form of democratic decision making.
7. Once the boundary between "high" and "low" effort is determined, you will record your personal rating on to your post-it note. It is the task of your fellow workers to be certain that you have recorded your rating truthfully.
8. You will then move into consumer groups to decide consumption. Your choice is between pizza and beer, and you are free to allocate your budget constraint in any combination of the two which makes you happiest. You will receive a budget constraint of 50 for "low" effort and 100 for "high" effort. Your choice must comply with:
    a. (planned quantity of pizza)*(current price of pizza) + (planned quantity of beer)*(current price of beer) ≤ budget constraint
9. It is the task of each neighborhood council to ensure that each individual is not overspending the budget constraint.
10. Then you should, together with your neighborhood consumption council, sum together the total demand and report that aggregate number to the consumer federation.
11. The IFB then receives these numbers and compares. If planned production matches planned consumption, then planned production and consumption will begin for the period. If not, the IFB will announce updated "prices" and the entire process begins again.
12. Once the planned consumption and production are equal, the economy "begins" for the year (and the simulation ends).

APPENDIX 5: DISCUSSION QUESTIONS

1. How does the iterative planning process suffer from this observation commonly attributed to Oscar Wilde: “The trouble with Socialism is that it takes too many evenings.” Think about this not only in terms of time usage but also in the way that relationships with neighbors might change.
2. Would the outcome have been different if the indicative wage of pizza labor and beer labor was changed instead of the indicative price of pizza and beer?
3. In an actual implementation, could the IFB have been replaced by a computer? What about the consumer and worker federations?
4. **Innovation.** Is there an incentive to innovate in production? How could this be improved?