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The Competition Game

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Abstract
The "Competition Game" is an in-class activity designed to provide undergraduate students with non-technical insights into the functioning of a private enterprise system from the perspectives of both workers and business owners. Lessons include the difficulty of equalizing outcomes in the real world (even when initial wealth endowments are equal), the importance of meritocracy, and the behaviors of successful business owners and employees. This note describes the game and its rules, offers tips on how to incentivize students to play it realistically, and provides details on how to create an Excel file for tracking action in the market; for generating random interest rates and taxes; and for looking up prices and expenses from tables.

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Even in relatively conservative regions of the United States, like the Upper Midwest, undergraduates imbued with statist views of political economy find their way into college classrooms with distressing frequency. Most appear to be the products of some combination of liberal parents, youthful naivety, and public school curricula that are strongly, if not intentionally, biased in favor of government action. Many view labor relations as a morality play pitting poor, powerless workers against omnipotent, oppressive employers. To help non-economics majors to develop a more nuanced view of the economy without invoking any economic theory beyond the demand curve, I developed the "Competition Game," an in-class exercise that can be completed in 75 to 90 minutes.

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* Thanks to my colleague, labor historian Matthew Pehl, for helping me to teach with this game and for comments made by audience members at the Bread and Roses Centennial Symposium held at the Lawrence History Center in Lawrence, Massachusetts, on April 28, 2012, where I presented an earlier version of this article. Any remaining errors, however, are my responsibility alone.

Instructors will find the game easy to learn and prepare; for the initial preparation, an uninterrupted hour will do in cases in which the instructor is proficient with Excel and follows the instructions below. (Of course it will take longer if instructors try to simplify or complicate the game, which I do not recommend until they give my version, which I have tried to make just complex enough to be realistic, a try.) Thereafter, preparation should take almost no time at all. At most, professors will need to spend a few minutes at an automated cash machine or gift card kiosk (and filling out a form if they are fortunate enough to teach in a department that will reimburse them for instructional costs).

To ensure that students are incentivized to play the game as realistically as possible, I recommend offering at least three cash prizes, with the top prize large enough to elicit considerable interest (say, the local price of a case of premium beer or a quarter keg of Natty Light) and the lowest enough for a latte. In South Dakota, that meant prizes of $20, $10, and $5 at the time of writing (before the Second Great Inflation). The prizes, which are awarded for the amount of play money accumulated during the game, should be announced beforehand and preferably physically displayed (I have always used cash, but gift cards to establishments frequented by students would probably work too) to the students beforehand so that the rewards are palpable and immediate. The order of play in the game is as follows:

1. Each student receives $75 or $100 in play money (or tokens such as poker chips).
2. Students randomly draw cards identifying them as owners or workers.[1] Worker cards also specify the number of widgets per

[1] This procedure could be changed, but eliminating the random draw would weaken the point that workers can do well in the game and that many of the capitalists will go bankrupt. The initial endowment does not determine the outcome of the game; a combination of the endowment, random elements, and each student's decisions influence the outcome, within a range of probability. My students have not yet gotten all the way to this conclusion, but I would be pleased if they did because it is a much more nuanced and realistic model than assuming the rich get richer (only endowments matter), a lucky few will thrive (only random forces matter), or hard work will prevail in the end (only individual actions are important).

hour the worker produces, which proxies for skilled, semi-skilled, and unskilled workers.

3. Each round or "week" begins with owners contracting with workers for any number of hours up to 100 and a wage or piece rate. (See the "display" tab in the appendix for suggestions about how to set up an Excel spreadsheet to track the action and make calculations.)
4. Owners then pay their workers for their efforts, borrowing from the professor-run bank if necessary to meet payroll. (Devoid of capital, workers cannot borrow from the bank. The spreadsheet can randomly determine the interest rate within professor-set parameters. See the appendix for details.)
5. Workers then pay their expenses, a flat $5 per week plus a charge for clothes, extra food, health care, lost leisure, and so forth that is a steeply ascending function of the number of hours that they worked. (See the "worker" tab in the appendix for a suggested schedule. The game will work with other schedules but may not be as realistic as few factory workers choose to work, or are physically capable of working, anything close to 100 hours per week for extended periods, at least at typical hourly wages.)
6. The bank then pays or receives the "Net Due" from the owners, or the difference between their revenues, which is the total output their workers created times the price per widget (a downward sloping demand curve or a descending function of the total number of widgets produced in that round as specified in the "price schedule" tab in the appendix), minus interest due on borrowings, taxes (again randomized as described in the appendix), and a flat $10 per week business fee. (Incidentally, the price and worker lookup tables should not be revealed to students, and of course instructors may modify them as they see fit.)
7. The game continues for a fixed time or number of rounds, each of which can be completed in just a few minutes depending on class size. Time limits on negotiations can be imposed if necessary to ensure the completion of several rounds in the time allotted. For 50 minute classes, I suggest 10 minutes of preparation during game class meeting minus 1 and 15 minutes of discussion during game class meeting plus 1. Those who teach in blocks of 75 minutes or longer can fit the entire game into one

class period, extending the preparation and discussion periods as desired.

By design and actual classroom use, lower than expected prices for widgets and random fluctuations in interest and tax rates drive the most reckless owners out of business. Typically, several workers "die" by running out of money, but some are able to buy failed businesses, which are sold by the bank to the highest bidder. The highest skilled workers are often able to come into third or fourth place without becoming owners.

Some students may try to form unions or cartels during the game. The government (i.e., me) allows them to, but other governments (instructors), especially those using the game to illustrate a particular society or era, may wish to ban or discourage such activities for historical accuracy. My government imposes sanctions for stealing money and intimidating other students. It also allows owners or workers to retire and pay only the fixed taxes due each round, but that rule can be modified without changing the essential nature of the game.

Students enjoy the competition game because they love all forms of instruction that involve doing things (and possibly winning cash). It also tends to draw out quieter students who are more comfortable taking action than talking about it. Most importantly, students take away several lessons from the gaming experience. First, even though they all start with the same cash endowment, some will end up bankrupt or dead and some rich, highlighting the difficulty of equalizing outcomes in the real world. Second, many members of the seemingly privileged group of owners will not win any of the real cash prizes whereas some workers will, either through their own labors or by becoming owners during the course of the game, suggesting a realistic degree of meritocracy. Third, the owners who take on the most risks or who are most ruthless toward workers typically do not win, a revelation to many who unsuccessfully grasped for first place by paying low wages to unskilled workers or by borrowing heavily to meet payroll.

Most students try to win a cash prize for themselves, but some will deliberately overpay workers out of friendship or some liberal sensibility. They invariably go bankrupt, creating a fourth lesson: overly generous employers do not last long. Sometimes, unskilled or semi-skilled workers conspire to enrich an owner who has promised to pay them real cash (or another liquid asset) if the owner wins one of the cash prizes. To raise the cost of such collusions, I make clear that I will not enforce any agreements regarding distribution of the real prize money. If the winner reneges, his/her victims will learn an important lesson about moral hazard. If s/he pays as promised, the lesson is that people will "game" even games to make a profit.

Playing the "Competition Game" in class will not turn radical students into advocates of private enterprise, but it will give passively statist non-economics majors a nuanced, if necessarily simplified, encounter with a market-based system. As the old adage "tell me, I forget; show me, I remember; involve me, I understand" suggests, such experiences can powerfully influence student attitudes toward more formal learning opportunities later in the course or in other classes.

Appendix: Setting Up the Excel Spreadsheet[2]

Display tab: This tab allows the instructor and the players to track the action in real time and can be easily adjusted as needed to accommodate larger classes.

Row 1: Column A = "Owners."
Row 2: Column A = "Name," B = "Total Output," C = "Price Per Widget," D = "Revenue," E = "Borrowings," F = "Interest Due," G = "Revenue Tax," H = "Charter Fee," and I = "Net Due."
Row 3: A = input student name; B = input total output; C = C$7; D = B3*C3; E = input borrowings from the bank; F = E3*B$40; G = D3*B$42; H = $10; I = D3-E3-F3-G3-H3.
Rows 4, 5, 6: repeat Row 3, substituting appropriate row numbers.
Row 7: A = "Totals"; B = sum(b3:b6); C = VLOOKUP(B7, Price, 2).
Row 8: blank
Row 9: A = "Workers"
Row 10: A = "Name"; B = "Output/Hour"; C = "Hours Worked"; D = "Total Output"; E = "Wage/Hr"; F = "Wage/Piece"; "Total Hour"; "Total Piece"; "Flat Expense"; "Variable Expense"; "Total Expense Due"
Row 11: A = input student name; B = input output per hour (from card the student randomly draws at the beginning of the game); C = input hours worked; D = B11*C11; E = input wage per hour (if applicable); F = input piece rate (if applicable); G = C11*E11; H = D11*F11; I = $5; J = VLOOKUP (c11, utility, 2); K = sum(I11:J11).
Rows 12 through 37 (or as necessary): repeat Row 11, substituting appropriate

[2] You can also download the file here: http://journal.apee.org/index.php/File:Competitiongame.xls.

row numbers.
Row 38: A = "Totals"; B = blank; C = SUM(C11:C37); D = SUM (D11:D37).
Row 39: A = "Random Variables"; B = blank; C = blank; D = "Minimum"; E = "Maximum"
Row 40: A = "Interest rate (%)"; B = RAND()*(E40-D40)+D40; C = blank; D = .01; E = .1
Row 41: blank
Row 42: A = "Corporate Revenue Tax (%)"; B = RAND(E42-D42)+D42; C = blank; D = .01; E = .1
Hitting the function key [F9] generates new random numbers between the minimum and maximum values in columns D and E, which instructors can adjust as desired to increase or reduce variability.

Price schedule tab (label this range "Price"):

Total Output	Price
0	$10.00
100	$5.00
1000	$2.00
2000	$1.00
3000	$0.50
4000	$0.25
5000	$0.10

Worker tab (label this range "utility"):

Hours Worked	Variable Expenses Due
0	$1.00
10	$2.00
20	$3.00
30	$4.00
40	$5.00
50	$10.00
60	$20.00
70	$40.00
80	$80.00
90	$160.00
100	$320.00