

Appendix: Viewing the Edgeworth Box Simulation Live on Your Computer

You use your computer to look at the dynamics of convergence of a two-good Edgeworth Box economy to the contract curve with ZI traders by following these instructions.

Software Name: Simul3.exe

Reference: D. K. Gode, Stephen E. Spear and Shyam Sunder, "Convergence of Double Auctions to Pareto Optimal Allocations in the Edgeworth Box," Revised May 2004. On the web: <http://www.som.yale.edu/Faculty/sunder/Edgeworth/Edgeworth.pdf>.

Hardware Requirements: Personal computer (DOS/Windows)

To Get the Software: Download a copy of file simul3.exe from <http://www.som.yale.edu/faculty/sunder/zisoft.html> and store it on your hard drive or a floppy. You may also run it directly from the abovementioned website.

To Run the Simulation:

When you run simul3.exe,

1. The computer prompts you for an initializing random seed. Enter any number between -32,768 and 32767, and press the ENTER key.
2. The computer prompts you for your choice of the speed of simulation. Enter any number between 1 (for the slowest speed) to 100 (fastest speed), and press the ENTER key.
3. The computer prompts you for how frequently you wish to have the indifference maps redrawn on the screen. Enter a number between 1 (for redrawing the indifference maps after every iteration) and 501 (for never redrawing the indifference maps) and press the ENTER key and enjoy the show.

What You See on the Screen:

Edgeworth Box: The endowment point of trader type 1 is (0.9, 0.1). The initial Indifference map of trader type 1 (cyan color) and trader type 2 (brown color) are drawn through the endowment point.

A second set of indifference maps are drawn so they are tangential to each other. The point of tangency is the competitive equilibrium (CE) point and the slope of the straight line from endowment point and the CE point (not drawn on screen) is the CE price.

The contract curve is drawn in green.

The pink curve from endowment point to the contract curve is the bisection locus of the angle between the indifference maps.

Except when the indifference maps are symmetrical, the point of intersection of the bisection locus with the contract curve does not coincide with CE.

Simulation: The step size for simulated transactions is set at 0.02 (Euclidean distance $(x^2+y^2)^{0.5}$). As each transaction is completed, a black-green line shows the movement of endowment point in steps of size 0.02.

In the right bottom of the screen, the bids and asks are shown in dots and completed transactions are shown in a continuous gray line. Horizontal gray line marks the CE price as a benchmark.

Cyan and brown lines show the current level of utility of trader types 1 and 2 respectively, and chart the change in utilities from the initial endowment level towards

the end of simulation. The horizontal colored lines indicate the utility levels attained by the two types of traders at CE (cyan for Type 1 and brown for Type 2). The third colored line (purple) is the average utility for both types of traders.

Parameters for Simulations

Utility of Type 1 traders: $x^{0.4}y^{0.6}$

Utility of Type 2 traders: $x^{0.8}y^{0.2}$

Endowment point: (0.8, 0.2)

Simulation step size (transaction quantity in Euclidean distance $(x^2+y^2)^{0.5}$): 0.02

Number of Iterations 1000