

From Arthur, W. Brian, "Foundations of Complexity Economics," *Nature Reviews Physics*, 3, 136-45, 2021.

Table 1: Differences between neoclassical and complexity economics

| Feature^a | Neoclassical economics | Complexity economics |
|--------------------------------|---|--|
| Agents | Representative, with 1, 2, N , or a distribution of types | Diverse |
| Organizing principle | Equilibrium. Agent behavior consistent with aggregate outcome | Nonequilibrium. Agent behavior reacts to aggregate outcome |
| Metaphor | Well-functioning machine | Ecology: of forecasts, actions, strategies |
| What is faced by agents | Well-defined problem | Ill-defined situation |
| Behavior | Agents optimize | Agents face fundamental uncertainty, they try to make sense, explore |
| Structural Change | The equilibrium shifts | Novelty causes endogenous restructuring |
| Rationality | Perfect and boundless | Rationality usually not defined |
| Feedbacks | Diminishing returns | Increasing as well as diminishing returns |
| Time | Equilibrium is timeless | History and path taken matter |
| Dominant Theme | Allocation of resources | Formation of structures |
| System | Closed to new behavior | Open. System can be exploited |
| Methods used | Mathematics. (Quantities, incentives in balance) | Mathematics and computation. (Algorithmic and event-driven) |
| Temporary phenomena | Excluded by equilibrium | Possibly emerge |
| Interaction | Homogeneous | Channeled by networks |
| Evolution of economy | Outcomes usually seen as in stasis. Not evolving | Economy self-creating, in perpetual novelty |

^aEntries are general, there may be exceptions to them in particular studies.