Boxed Economy Model
Fundamental Concepts and Perspectives

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Why Misunderstand with macro model?

- a priori value in goods?
- interpretational individuality
- psychological individuality
- incomplete information
- interaction
- dynamic network and non-linearity
- emergence
- micro-macro loop
- non-economic effect
Macro model & Agent-based model

Macro model

Agent-based model
Open the Black Box!
Boxed Economy Model is...

- the model framework for agent-based economic simulations,
- modeled by object-orientation,
- implemented by Java language,
- intended to be open-source program,
- designed for sharing and co-improving.
As a tool box.

- Insight
- Analysis & Explanation
- Prediction

As a toy box.

- Food for thought
- Education
- Game
For success with social simulation
Framework is the architecture template that is specialized to a certain domain. Using the framework makes followers not only to reuse the source codes but also to reuse the architecture design.
Box Simulator Framework
Boxed Economy Model Framework
Model Composition
... in progress

Prototype of Box Simulator Framework

Prototype of Boxed Economy Model Framework

• Version 1 with some components – in 10 months!
Inductive and Deductive Parameter Estimation

Conventional econometrics

Simulational econometrics
In-The-Box project

- To make platforms for
  - Artificial society
  - Artificial economy
  - Artificial market

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Incremental Development and Application Process

Development of the Simulation

Application of The Simulation

Prediction or Explanation

Prediction or Explanation
Simulation is ...
How Build Reality?

Possible World

FACT

Model and Initial condition

simulation

result
Deductive Estimation

As a result, we estimated this initial settings.

Dashed box:
- macroscopic results
- macroscopic data
- Real World
- extract microscopic parameters

Legend:
- GDP
- unemployment Rate
- simulation run #0153
- simulation run #1665
- simulation run #3972

Diagram:
- an instance of Box Economy
Component Composition

- cognitive science
- social psychology
- consumer behavior
- marketing science
- management science
- artificial intelligence

- reinforcement learning
- neural network

algorithm model component

meta-algorithm Model component

adaptive component

agent model component
Component Composition

- communication studies
- social network analysis
- Sociology
- distributed artificial intelligence

relation model component

agent model component

composed social model
Economic Methodological Point of View

- Reality building
- Model Validation
- No social model is perfect
- Extensibility
“Social Simulation Engineering”

- Development process
- Development group
- Social Modeling Skills
- Design Pattern for Agent-Based Social Simulation
- Technology Transfer
“Neo-Instrumentalism”

- Instrumentalism
  +
- Extensibility of model
- Reality of the assumptions
Engineering Point of View

- development process
- software quality
  (accuracy and reliability)

- Most simulation models are built from scratch each time.
- The source codes of most simulations are not opened to public.
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