

System Modelling and Simulation applied in the field of Economy

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Abstract

The talk will address the benefit of applying mathematical modelling and simulation in scenarios in economy. Mathematical modelling opens the possibilities to replace rather simple static formulas by dynamical models for simulating a certain system behavior. The resulting simulation outcomes can be used to analyse potential system and business processes of an economic or socioeconomic system. Moreover certain forecasts can be done by using several simulation runs to support decision-making on the basis of scientific valid statements.

1. Dynamic Models

Important is the difference between a dynamical model and a static formula. The difference is the usage of a mathematical description. A static formula is using a function f , which has an input list several variables and inputs x_1, \dots, x_n and the output y is given by

$$y=f(x_1, \dots, x_n).$$

A mathematical model is defined via a feedback in the description of a dynamic system. Figure 1 illustrates the basic principle of a system model and the corresponding dynamic system, which represents a mathematical model.

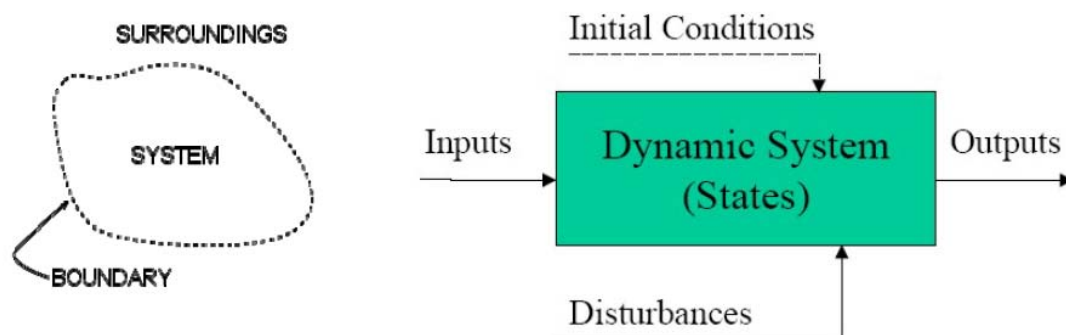


Figure. 1. Dynamic System Representation for Modelling a certain System Behavior

2. Use and Application

The modelling theory provides through the dynamic system modelling a tool which can be used for forecasting. If a certain strategy for a company has to be chosen the policy maker and decision-maker can simulate a certain strategy by using the mathematical model. For this purpose the simulation results can be analyzed and can help decide which strategy can be applied.

References

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