

Computer Models in Undergraduate Economics

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The formal modeling of decisions and actions divides into two forms, one that seeks to mimic by step-by-step duplication and another that relies on a 'black box' to complete its process. The mode that is applied in modeling in a discipline is controlled by a framework of goals and restrictions. The framework yields the fundamental assumptions and structure of a model, dictating both its uses and abuses. While a computer program may allow a model to be manipulated for a number of ends which would be difficult to achieve otherwise, such as self tutorials, group interactions and individual exploration, the value of these efforts and of a model are found in the model's environment external to the computer. The external factors are the essential elements in defining the character of a model, as they define the issues a model will treat, as well as its type, mimicry or processing.

The speed of a machine and the flexibility of languages may lull an unsuspecting participant into believing that computing adds a new dimension to modeling itself. The ability to challenge the structure of a model should not be taken as a new face of modeling. The computer has simply provided a means, particularly for those new to modeling, by which the importance of the environment of a model can easily be delineated.

This tendency to misinterpret the contributions of computers is, perhaps, exacerbated by the techniques involved in the teaching of an understanding of a model, which frequently entails adjustment of a model's basic assumptions to highlight the importance of those assumptions. One value of computing in teaching lies in its contributions to answering an age-old question involved with models of any kind

- Just what is it that this model does do?
In teaching applications of models or modeling itself, the importance of this question and its answer are paramount, but in modeling itself the critical task is defining the assumptions to ensure the model acts in the desired way or in accordance with those assumptions. The teaching process blurs this distinction, particularly when dealing with models designed for teaching of specific concepts.

In an undergraduate program the emphasis usually lies in applications of models. A model, either micro or macro, is presented in a theoretical framework, with a set of assumptions relating to a particular view of an economic system or component of a system. The object is to provide the student with a structure for comprehending and analyzing the components involved in economic activity. In this effort, the computer does not fundamentally change or contribute. However, as described above, the learning process may be enhanced for some students who benefit from repetitive presentation of a sequence of actions or from many alternatives displayed in sequence without the stress of computations. For these individuals the computer offers an alternative way to following the link of assumptions to economic behavior. Drill does not supplant the need to communicate that the model is dependent upon the fundamental framework and is a theoretical abstraction. The problems inherent in communicating abstraction remain.