Appendix C: How to Read a DYNAMO Flow Diagram

A flow diagram is an illustration of the postulated relationships between the elements in a model system. It depicts the model assumptions with a degree of detail midway between the dynamically suggestive but incomplete causal-loop diagram and the detailed, precise DYNAMO equations. More complete information on DYNAMO flow diagrams, equations, and other conventions can be found in Forrester (1961, 1968) and Pugh (1970).

A DYNAMO flow diagram has seven main components (see Figure C-1):

Rectangles represent levels, for example, nonrenewable resources NR, industrial capital IC.

Valves represent rates, for example, nonrenewable resource usage rate NRUR, industrial capital depreciation rate ICDR.

Circles represent auxiliaries, for example, industrial output IO, per capita resource usage multiplier PCRUM. Table functions (see Appendix D) are indicated by overlining and underlining the DYNAMO variable name as in the auxiliary PCRUM.

Solid arrows represent material flows, for example, the solid arrow leaving nonrenewable resources NR represents the material flow of resources from a stock or inventory of resources. Dashed arrows represent flows of information, for example, information about the level of nonrenewable resources is used to determine the nonrenewable resource fraction remaining NRFR.

Input lines represent information inputs from constant parameters, for example, industrial capital-output ratio ICOR.

A double circle represents an exogenous, time-dependent input, for example, population POP. Since this input is determined in another sector of World3, it is exogenous to the nonrenewable resource sector as it is drawn in Figure C-1.