3.5 DESCRIPTION OF EQUATIONS

Since the agriculture sector is described separately in Chapter 4, only the data and assumptions underlying the equations of the industrial and service sectors are discussed here. The DYNAMO flow diagram of these equations and their interfaces with other sectors of the global model are shown in Figure 3-13. The capital sector is composed of six dynamic substructures:

1. The current values of the stocks of industrial and service capital are computed by integrating the difference between their respective investment and depreciation rates.
2. The industrial output is found by dividing the stock of industrial capital not allocated to obtaining resources by the industrial capital-output ratio. The service output is calculated by dividing the total service capital stock by the service capital-output ratio.
3. A constant fraction of the industrial output is consumed each year and does not further influence any other model variable. The rest of the industrial output is considered to be capital goods, which are allocated among service capital investments, agricultural investments, and industrial capital investments.
4. The computational allocation of the industrial output among its different uses depends on the level of industrialization reached by the society as measured by the industrial output per capita.
5. The current total number of jobs in the industrial sector is computed by multiplying the total industrial capital by the number of jobs per industrial capital unit at the current level of industrial output. The current total number of jobs in the service sector is computed similarly. The number of jobs per hectare of arable land is a function of the capital inputs per hectare. The total number of agricultural jobs is the product of arable land and jobs per hectare.
6. The labor-capital ratio does not influence output under normal circumstances. Only when the size of the labor force is very small relative to the capital stock will industrial and service outputs be less than those suggested by the respective capital stocks and capital-output ratios.

The industrial output per capita IOPC is the central element of the capital sector with links to nearly every other sector of World3. We thus start the equation descriptions with this variable and work back through the other elements of the capital sector.

Industrial Output per Capita IOPC

```
IOPC,K=IO.K/POP.K                                          49, A
   IOPC   - INDUSTRIAL OUTPUT PER CAPITA (DOLLARS/
            PERSON-YEAR)
   IO     - INDUSTRIAL OUTPUT (DOLLARS/YEAR)
   POP    - POPULATION (PERSONS)
```


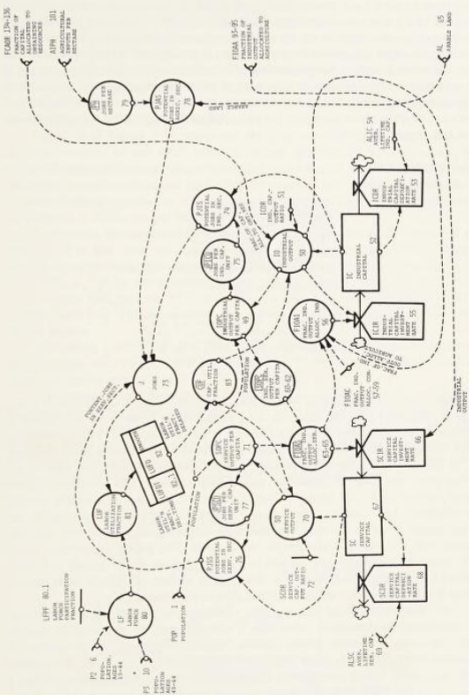

Figure 3-13 DYNAMO flow diagram of the capital sector