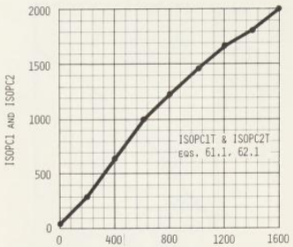

Figure 3-23 Indicated service output per capita table

Fraction of Industrial Output Allocated to Services FIOAS The fraction of industrial output allocated to services FIOAS influences the quantity of capital invested each year in the service sector to increase the material stock of service capital. If current service output per capita SOPC is lower than that indicated by the current level of industrial output per capita IOPC, then greater emphasis is placed on investing in the service sector, and FIOAS increases. When SOPC is found to be higher than would be indicated by the level of IOPC, FIOAS is decreased.

As shown in Figure 3-24, the fraction of industrial output allocated to services FIOAS was defined as a function of the ratio of SOPC to ISOPC. If the ratio is greater than 1.0, meaning that the actual output is greater than the indicated output, then less industrial output is invested in services. If the ratio is less than 1.0, meaning that the actual output is less than the indicated output, then more industrial output is invested in services. When the actual and indicated outputs are equal (SOPC/ISOPC = 1.0), 10 percent of industrial output is invested in services. This is the percentage that we found, by experimenting with the model, to be necessary to offset depreciation of service capital.

The slope of the table function determines the magnitude of the response to any discrepancy between actual and indicated service output levels. Thus it is an expression of the response time of the system to a relative surplus or scarcity of output in the service sector. If the line is made steeper, a given change in the ratio of SOPC and ISOPC will produce a larger change in FIOAS. As a consequence, the discrepancy will be more quickly eliminated.

There is no general criterion by which to choose a "best" slope for this table function; any slope that gives a relatively short adjustment time and an equilibrium value for the ratio near unity is acceptable. The slope chosen gives an adjustment time of about three years and an equilibrium ratio of SOPC to ISOPC during the growth phase of slightly less than unity. To permit a change in the slope of the FIOAS curve during the simulation (at TIME=PYEAR), two FIOAS curves, FIOAS1 and FIOAS2, were defined in the DYNAMO listing.

```
FIOAS.K=CLIP(FIOAS2.K,FIOAS1.K,TIME.K,PYEAR)          63, A
    FIOAS  - FRACTION OF INDUSTRIAL OUTPUT ALLOCATED TO
             SERVICES (DIMENSIONLESS)
    CLIP   - A FUNCTION SWITCHED DURING THE RUN
    FIOAS2 - FIOAS, VALUE AFTER TIME=PYEAR
             (DIMENSIONLESS)
    FIOAS1 - FIOAS, VALUE BEFORE TIME=PYEAR
             (DIMENSIONLESS)
    TIME   - CURRENT TIME IN THE SIMULATION RUN
    PYEAR  - YEAR NEW POLICY IS IMPLEMENTED (YEAR)


FIOAS1.K=TABHL(FIOAS1T,SOPC.K/ISOPC.K,0,2,.5)         64, A
FIOAS1T=.3/.2/.1/.05/0                                64.1, T
    FIOAS1 - FIOAS, VALUE BEFORE TIME=PYEAR
             (DIMENSIONLESS)
    TABHL  - A FUNCTION WITH VALUES SPECIFIED BY A TABLE
    FIOAS1T- FIOAS1 TABLE
    SOPC   - SERVICE OUTPUT PER CAPITA (DOLLARS/PERSON-
             YEAR)
    ISOPC  - INDICATED SERVICE OUTPUT PER CAPITA
             (DOLLARS/PERSON-YEAR)

FIOAS2.K=TABHL(FIOAS2T,SOPC.K/ISOPC.K,0,2,.5)         65, A
FIOAS2T=.3/.2/.1/.05/0                                65.1, T
    FIOAS2 - FIOAS, VALUE AFTER TIME=PYEAR
             (DIMENSIONLESS)
    TABHL  - A FUNCTION WITH VALUES SPECIFIED BY A TABLE
    FIOAS2T- FIOAS2 TABLE
    SOPC   - SERVICE OUTPUT PER CAPITA (DOLLARS/PERSON-
             YEAR)
    ISOPC  - INDICATED SERVICE OUTPUT PER CAPITA
             (DOLLARS/PERSON-YEAR)
```

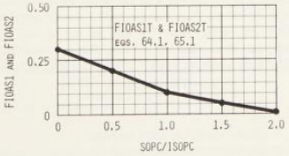

Figure 3-24 Fraction of industrial output allocated to services table