Service Capital Investment Rate SCIR

```
SCIR.KL=(IO.K)(FIOAS.K)                                    66, R
   SCIR   - SERVICE CAPITAL INVESTMENT RATE (DOLLARS/
              YEAR)
   IO     - INDUSTRIAL OUTPUT (DOLLARS/YEAR)
   FIOAS  - FRACTION OF INDUSTRIAL OUTPUT ALLOCATED TO
              SERVICES (DIMENSIONLESS)
```

The service capital investment rate SCIR augments the stock of service capital, thereby increasing the ability of the economy to produce services. The amount of goods and equipment invested in the service sector each year is simply the industrial output IO multiplied by the fraction of industrial output allocated to services FIOAS. As in the industrial sector, the rate represents gross investment.

Service Capital SC

```
SC.K=SC.J+(DT)(SCIR.JK-SCDR.JK)                            67, L
SC=SCI                                                     67.1, N
SCI=1.44E11                                                67.2, C
   SC     - SERVICE CAPITAL (DOLLARS)
   DT     - TIME INTERVAL BETWEEN CONSECUTIVE
              CALCULATIONS (YEARS)
   SCIR   - SERVICE CAPITAL INVESTMENT RATE (DOLLARS/
              YEAR)
   SCDR   - SERVICE CAPITAL DEPRECIATION RATE (DOLLARS/
              YEAR)
   SCI    - SERVICE CAPITAL INITIAL (DOLLARS)
```

Service capital SC is the physical stock of buildings and equipment that produces a stream of services through time. The stock is the accumulation of previous service capital investment rates SCIR minus previous service capital depreciation rates SCDR.

The initial (1900) value of service capital SCI was obtained through an analysis similar to that presented in connection with the initial value of industrial capital ICI earlier in this section. As shown there, we assumed a service output per capita SOPC in 1900 of 90 dollars per person-year. We then set the service capital-output ratio SCOR equal to one year, so that the initial value of service capital SC is

$$\begin{aligned} SC(1900) &= [SOPC(1900)] \times [POP(1900)] \times SCOR \\ &= \$90 \times 1.6 \times 10^9 \times 1 \\ &= \$1.4 \times 10^{11}, \end{aligned}$$

where

SC(1900) = service capital in 1900 (dollars)
POP(1900) = population in 1900 (people)
SCOR = service capital-output ratio (years)
SOPC(1900) = service output per capita in 1900 (dollars per person-year)

Service Capital Depreciation Rate SCDR

```
SCDR.KL=SC.K/ALSC.K                                        68, R
   SCDR   - SERVICE CAPITAL DEPRECIATION RATE (DOLLARS/
              YEAR)
   SC     - SERVICE CAPITAL (DOLLARS)
   ALSC   - AVERAGE LIFETIME OF SERVICE CAPITAL (YEARS)
```

The depreciation rate of service capital SCDR was formulated in the same manner as the depreciation of industrial capital ICDR, the depreciation in any year being the current stock of service capital SC divided by the average lifetime of service capital ALSC.

Average Lifetime of Service Capital ALSC

```
ALSC.K=CLIP(ALSC2,ALSC1,TIME.K,PYEAR)                      69, A
ALSC1=20                                                   69.1, C
ALSC2=20                                                   69.2, C
   ALSC   - AVERAGE LIFETIME OF SERVICE CAPITAL (YEARS)
   CLIP   - A FUNCTION SWITCHED DURING THE RUN
   ALSC2  - ALSC, VALUE AFTER TIME=PYEAR (YEARS)
   ALSC1  - ALSC, VALUE BEFORE TIME=PYEAR (YEARS)
   TIME   - CURRENT TIME IN THE SIMULATION RUN
   PYEAR  - YEAR NEW POLICY IS IMPLEMENTED (YEAR)
```

The average lifetime of service capital ALSC can be expected to be longer than the average lifetime of industrial capital ALIC because of the larger proportion of buildings in the stock of service capital. We chose a lifetime of 20 years—a value compatible with the national accounts data presented in Figure 3-7—by the procedure discussed in connection with the derivation of the average lifetime of industrial capital ALIC. Uncertainty about the numerical value of this parameter caused us to include a CLIP function in its definition so that its value can be changed from ALSC1 to ALSC2 during the run at TIME=PYEAR.

Service Output SO

```
SO.K=(SC.K*CUF.K)/(SCOR.K)                                 70, A
   SO     - SERVICE OUTPUT (DOLLARS/YEAR)
   SC     - SERVICE CAPITAL (DOLLARS)
   CUF    - CAPITAL UTILISATION FRACTION
              (DIMENSIONLESS)
   SCOR   - SERVICE CAPITAL-OUTPUT RATIO (YEARS)
```

Under most conditions, all service capital SC will be fully utilized, and the service output SO will equal the ratio of SC to the service capital-output ratio SCOR. Under rare circumstances, however, a severe shortage of labor might force some service