



Figure 3-48 Run 3-9: behavior of the capital sector when the population declines after 1970

simulated in Run 3-9 (Figure 3-48). The decline in population after 1970 has the immediate effect of increasing both service and industrial outputs per capita SOPC and IOPC. However, SOPC begins to fall by 1970 because of the declining labor force LF and the consequent unutilized capital, which eventually force SOPC and, later, IOPC to decline as well.

The structure of the capital sector is sufficiently simple that the nine runs presented in Chapter 3 portray all modes of capital's behavior witnessed in our analyses of World3. However, through interaction with the population, pollution, resource, and agriculture sectors, the behavior mode of the capital sector may change several times during the course of a simulation run. To understand that interaction more fully we describe the structure of the agriculture sector in Chapter 4.

APPENDIX : PROGRAM LISTING

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NOTE CAPITAL SECTOR WITH EXOGENOUS INPUTS
NOTE
NOTE INDUSTRIAL SUBSECTOR
49 A IOPC.R=IO.K/POP.K
50 A IO.K=(IC.E)(1-PCADR.K)(CUP.K)/ICOR.K
51 A ICOR.K=CLIP(ICOR2,ICOR1,TIME.K,PTEAR)
C ICOR1=3
C ICOR2=3
52 L IC.K=IC.J*(DT)(ICIR.JA-ICDR.JA)
H IC=IC1
C IC1=1.1E11
53 R ICDR.KA=IC.K/ALIC.K
54 A ALIC.K=CLIP(ALIC2,ALIC1,TIME.K,PTEAR)
C ALIC1=14
C ALIC2=14
55 R ICIR.KA=(IO.K)(FIOAI.K)
56 A FIOAI.K=(1-FIOA.K-FIOAS.K-FIOAC.K)
57 A FIOAC.K=CLIP(FIOACV.K,FIOACC.K,TIME.K,1GT)
C IGT=4000
58 A FIOACC.K=CLIP(FIOAC2,FIOAC1,TIME.K,PTEAR)
C FIOAC1=.43
C FIOAC2=.43
59 A FIOACV.K=TABUL(FIOACVT,IOPC.K/IOPCD,0.2,.2)
T FIOACVT=.3/.32/.34/.36/.38/.43/.73/.77/.81/.82/.83
C IOPCD=400
NOTE
NOTE SERVICE SUBSECTOR
60 A ISOPC.K=CLIP(ISOPC2.K,ISOPC1.K,TIME.K,PTEAR)
61 A ISOPC1.K=TABUL(ISOPC1T,IOPC.K,0,1600,200)
T ISOPC1T=40/300/640/1000/1220/1450/1650/1800/2000
62 A ISOPC2.K=TABUL(ISOPC2T,IOPC.K,0,1600,200)
T ISOPC2T=40/300/640/1000/1220/1450/1650/1800/2000
63 A FIOAS.K=CLIP(FIOAS2.K,FIOAS1.K,TIME.K,PTEAR)
64 A FIOAS1.K=TABUL(FIOAS1T,SOPC.K/ISOPC.K,0.2,.5)
T FIOAS1T=.3/.2/.1/.05/0
65 A FIOAS2.K=TABUL(FIOAS2T,SOPC.K/ISOPC.K,0.2,.5)
T FIOAS2T=.3/.2/.1/.05/0
66 R SCIR.KA=(IO.K)(FIOAS.K)
L SC.K=SC.J*(DT)(SCIR.JA-SCDR.JA)
H SC=SC1
C SC1=1.44E11
68 R SCDR.KA=SC.K/ALSC.K
69 A ALSC.K=CLIP(ALSC2,ALSC1,TIME.K,PTEAR)
C ALSC1=20
C ALSC2=40
70 A SO.K=(SC.K)(CUP.K)/SCOR.K
71 A SCOR.K=SO.K/POP.K
72 A SCOR2.K=CLIP(SCOR2,SCOR1,TIME.K,PTEAR)
C SCOR1=1
C SCOR2=1
NOTE
NOTE JOG SUBSECTOR
73 A J.K=PJIS.R+PJAS.K+PJSJ.K
74 A PJIS.K=(IC.K)(JPICU.K)
75 A JPICU.K=TABUL(JPICUT,IOPC.K,50,800,150)(1E-3)
T JPICUT=.37/.18/.12/.09/.07/.06
76 A PJSJ.K=(SC.K)(JPSCU.K)
77 A JPSCU.K=TABUL(JPSCUT,SOPC.K,50,800,150)(1E-3)
T JPSCUT=.1/.6/.35/.2/.15/.15
78 A PJAS.K=(JPJ.K)(AL.K)
79 A JPJ.K=TABUL(JPJT,ALPH.K,2,30,4)
T JPJT=.2/.5/.4/.3/.27/.24/.2/.2
80 A LP.K=(P2.K+P3.K)*LPPF
C LPPF=.75
81 A LUP.K=L/LF.K
82 A LUPD.K=SMOOTH(LUP.K,LUPUT)
C LUPUT=2
83 A CUP.K=TABUL(CUPF,LUPD.K,1,11,2)
H CUP=1
T CUPF=1/.9/.7/.3/.1/.1
NOTE
NOTE EXOGENOUS INPUTS TO THE CAPITAL SECTOR

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